MONTGOMERY TOWNSHIP SCHOOLS

LOWER MONTGOMERY MIDDLE SCHOOL

373 BURNT HILL ROAD
SKILLMAN, NJ 08558

FACILITY ENERGY REPORT

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I. HISTORIC ENERGY CONSUMPTION/COST

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

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

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

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

The gas usage profile within each facility report shows the actual natural gas energy usage for the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: PSE&G
Rate: LPLS
Meter No: 778012623
Account # 4200813904 & 6749748600
Third Party Utility Provider: South Jersey Energy Company
TPS Meter / Acct No:

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Nov-10	120,405	344.0	$17,539
Dec-10	108,803	292.0	$15,774
Jan-11	110,600	284.0	$15,774
Feb-11	110,602	284.0	$15,797
Mar-11	100,402	276.1	$14,484
Apr-11	101,614	424.9	$14,065
May-11	158,006	532.8	$25,559
Jun-11	190,003	536.7	$29,456
Jul-11	169,603	428.1	$25,809
Aug-11	116,001	300.1	$17,905
Sep-11	177,600	508.0	$23,564
Oct-11	143,600	488.0	$19,400
Totals	**1,607,239**	**536.7 Max**	**$235,125**

AVERAGE DEMAND **391.6 KW average**
AVERAGE RATE **$0.146** **$/kWh**

Figure 1
Electricity Usage Profile

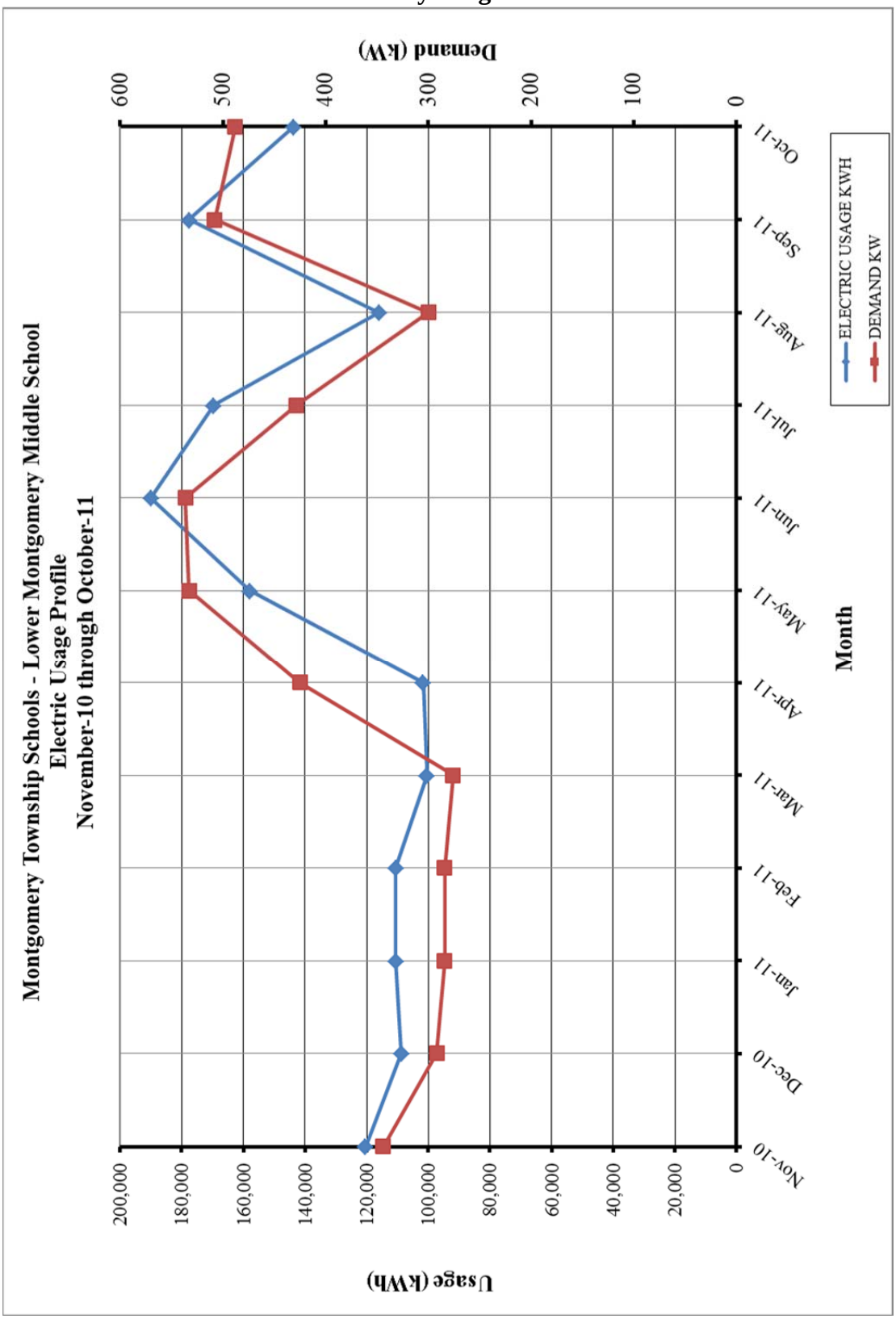
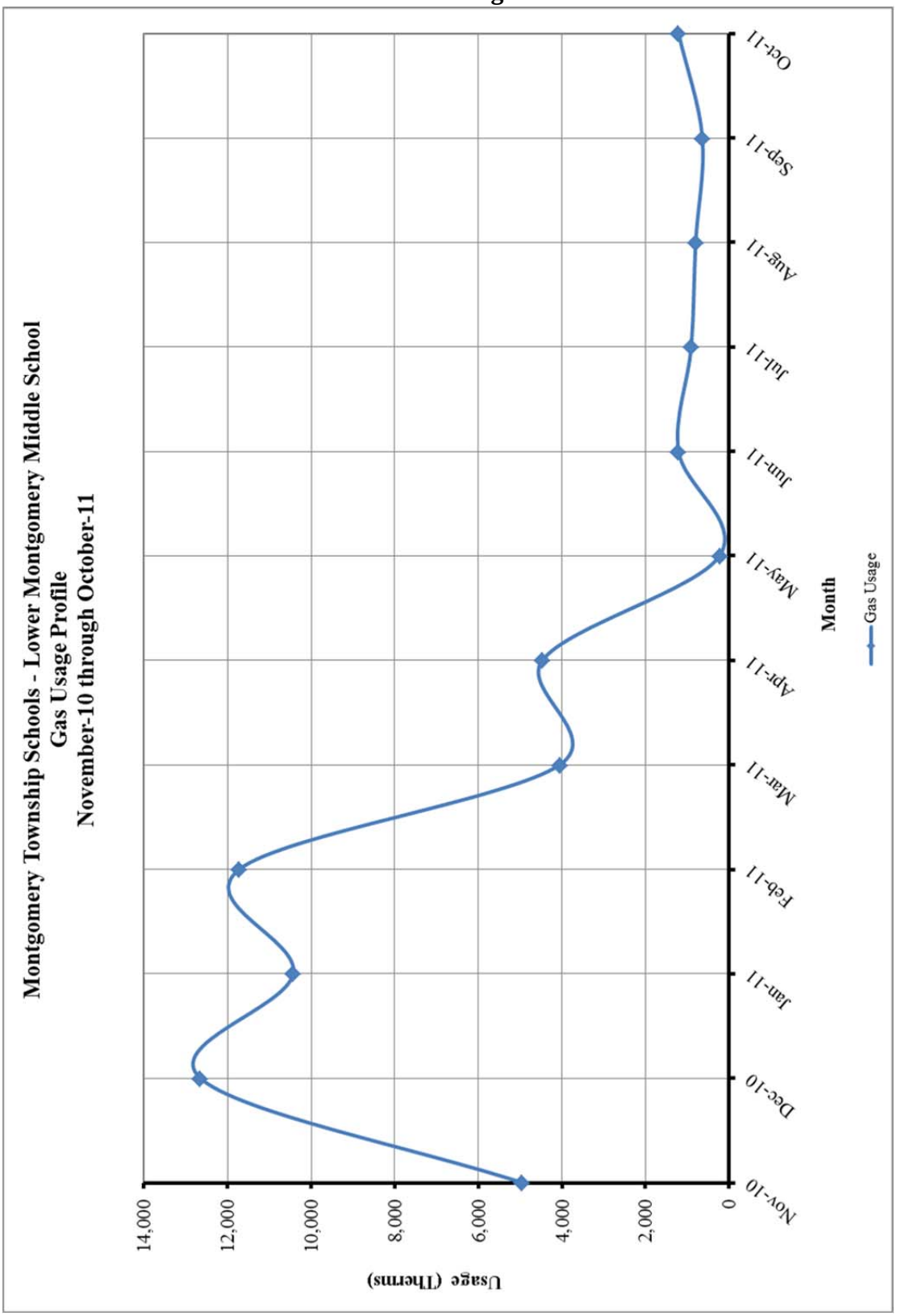


Table 4
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: PSE&G		
Rate: LVG		
Meter No: 2643842		
Account Number 42 008 139 04		
Third Party Utility Provider: HESS		
TPS Meter No: 359646/361980		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Nov-10	4,961.00	$5,336.46
Dec-10	12,656.00	$11,717.72
Jan-11	10,431.00	$9,817.72
Feb-11	11,715.00	$11,100.37
Mar-11	4,049.00	$3,095.41
Apr-11	4,468.00	$3,350.20
May-11	229.00	$266.09
Jun-11	1,214.00	$977.21
Jul-11	908.00	$767.18
Aug-11	803.00	$684.75
Sep-11	643.00	$538.44
Oct-11	1,214.00	$2,289.19
TOTALS	**53,291.00**	**$49,940.74**
AVERAGE RATE:	**$0.94**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The Montgomery TownshipLower Middle School is located on 373 Burnt Hill Road in Skillman, New Jersey. The 127,298 SF Middle School was built in 1997 with renovations to the HVAC systems done in 2011.

Occupancy Profile

The typical hours of operation for the Middle School are Monday through Fridayfrom7:30 am to 4:00 pm for students and further occupancy hours from 4:30 pm to 11:00 pm for cleaning. The upper Middle School is also occupied for long durations during Saturday from approximately 8:00 am to 8:30 pm and Sunday from approximately 12:00 pm to 6:00 pm. The Upper Middle School has a student population of 840 and a staff of 105.

Building Envelope

Exterior walls for the Middle School are masonry construction using a dark-redface brick and dark-brown trim brick. Exterior walls consist of 4" face brick, 1" air space, 1-1/2" rigid insulation and 8" CMU. The windows throughout the Middle School are in good condition and appear to be maintained. Typical windows throughout the Middle School are double pane, ¼" tinted glass with aluminum frames. Internal blinds are utilized throughout the school for occupant comfort. The blinds are valuable because they help to reduce solar heat in the summer. The roof is flat, loose layed / ballasted EDPM with tapered insulation. The amount of insulation ranges from 2" to 5" depending on the location and slope of the roof.

HVAC Systems

The Middle SchoolHVAC system consists of a four-pipe cooling and heating system utilizing hot water boilers and packaged air cooled chillers piped to terminal equipment.

Heating is provided by a total of four (4) Burnham firetube boilers, two (2) in each mechanical room which provide hot water to unit ventilators and heating coils throughout the middle school. The hot water boilers are gas-fired with inputs of 2,930 and 2,500 MBH and outputs of approximately 2,343 and 2,009 MBH with an estimated efficiency of 80%. These boilers were installed 1997 and are within their useful service life as defined by ASHRAE. Hot water is circulated throughout the building's heating hot water loop via base mounted, end suction pumps. Two 5 HP pumps are located in the Block E Mechanical Room, rated for 231 GPM at 52 feet of head. Two 5 HP pumps are located in the Block F Mechanical Room, rated for 120 GPM at 78 feet of head. All pump motors have standard efficiency motors.

Cooling is provided by a total of two (2) air-cooled chillers located on grade adjacent to each Mechanical Room. The Chiller at Block B is a McQuay190 ton unit. The Chiller at Block F is a McQuay155 ton unit. Both chillers were installed in 1997 and are within the last quarter of their useful service life as defined by ASHRAE. The chillers circulate a 30% glycol solution between the outdoor units and indoor heat exchangers. Chilled water is circulated throughout the building's chilled water loops via base mounted, end suction pumps. Two 25 HP pumps are located in the Block B Mechanical Room, rated for 600 GPM at 106 feet of head. Two 15 HP

pumps are located in the Block F Mechanical Room, rated for 294 GPM at 105 feet of head. All chilled water pump motors were replaced in 2011 and are premium efficiency Baldor motors.

Exhaust System

Air is transferred from classroom spaces to large toilet rooms via a transfer fan. Air is then exhausted from the toilet rooms through the roof exhausters. Where there are no large toilet rooms, exhaust air is ducted from the classrooms via an in-line exhaust fan, then discharged to the atmosphere through a relief vent.

HVAC System Controls

The HVAC systems throughout the facility are controlled via DDC controls as manufactured by Johnson Controls. The building equipment operational status (on/off) and temperature set points are controlled through a central station terminal. Boilers are operated based on outside air temperature reset.

Domestic Hot Water

Domestic hot water for the restrooms and kitchen is provided by three (3) AO Smith Conservationist domestic hot water heaters, located within in the mechanical rooms. The water heaters in Mechanical Room, Block B havea storage capacity of 300 gallons and a recovery rate of 291 gal/hr with an input capacity of 300 MBH and a storage capacity of 200 gallons and a recovery rate of 776 gal/hr with an input capacity of 800 MBH. The water heater in Mechanical Room, Block F has a storage capacity of 300 gallons and a recovery rate of 291 gal/hr with an input of 300 MBH.

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.

III. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation ofenergy conservation measures could yield substantial energy savings. The list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment in some cases if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to the **Major Equipment List Appendix**for this facility.

IV. ENERGY CONSERVATION MEASURES

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

Table 1
ECM Financial Summary

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Lighting Upgrade	$23,828	$7,074	3.4	345.3%
ECM #2	Gym Lighting Upgrade	$5,040	$3,129	1.6	831.4%
ECM #3	Lighting Controls Upgrade	$36,860	$13,458	2.7	447.7%
ECM #4	Boiler Replacement	$265,898	$5,264	50.5	-52.5%
ECM #5	Domestic Hot Water Replacement	$101,678	$1,628	62.5	-80.8%
ECM #6	Chiller Replacement	$455,510	$15,312	29.7	-32.8%
ECM #7	VFD on Hot Water Pumps	$278,522	$2,492	111.8	-82.1%
ECM #8	VFD on Chilled Water Pumps	$281,677	$2,620	107.5	-81.4%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	724.27 KW PV System	$4,312,395	$454,618	9.5	58.1%
Notes:	A. Cost takes into consideration applicable NJ Smart StartTM incentives.				
	B. Savings takes into consideration applicable maintenance savings.				

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	**DESCRIPTION**	**ANNUAL UTILITY REDUCTION**		
		ELECTRIC DEMAND (KW)	**ELECTRIC CONSUMPTION (KWH)**	**NATURAL GAS (THERMS)**
ECM #1	Lighting Upgrade	18.3	48,450.0	0.0
ECM #2	Gym Lighting Upgrade	8.2	21,434.4	0.0
ECM #3	Lighting Controls Upgrade	27.9	92,178.3	0.0
ECM #4	Boiler Replacement	0.0	0.0	5,601.0
ECM #5	Domestic Hot Water Replacement	0.0	0.0	1,379.0
ECM #6	Chiller Replacement	0.0	104,880.0	0.0
ECM #7	VFD on Hot Water Pumps	0.0	17,074.0	0.0
ECM #8	VFD on Chilled Water Pumps	0.0	17,945.0	0.0
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	**DESCRIPTION**	**ANNUAL UTILITY REDUCTION**		
		ELECTRIC DEMAND (KW)	**ELECTRIC CONSUMPTION (KWH)**	**NATURAL GAS (THERMS)**
REM #1	724.27 KW PV System	724.3	855,180	0

Table 3
Facility Project Summary

ENERGY SAVINGS IMPROVEMENT PROGRAM - POTENTIAL PROJECT					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade	$7,074	$23,828	$0	$23,828	3.4
Gym Lighting Upgrade	$3,129	$8,640	$3,600	$5,040	1.6
Lighting Controls Upgrade	$13,458	$37,950	$1,090	$36,860	2.7
Boiler Replacement	$5,264	$275,898	$10,000	$265,898	50.5
~~Domestic Hot Water Replacement~~	~~$1,628~~	~~$104,000~~	~~$2,322~~	~~$101,678~~	~~62.5~~
~~Chiller Replacement~~	~~$15,312~~	~~$469,000~~	~~$13,490~~	~~$455,510~~	~~29.7~~
~~VFD on Hot Water Pumps~~	~~$2,492~~	~~$278,738~~	~~$216~~	~~$278,522~~	~~111.8~~
~~VFD on Chilled Water Pumps~~	~~$2,620~~	~~$283,619~~	~~$1,942~~	~~$281,677~~	~~107.5~~
Design / Construction Extras (15%)		$51,947		*$51,947*	
Total Project	**$28,925**	**$398,263**	**$14,690**	**$383,573**	**13.3**

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

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

ECM #1: Lighting Upgrade – General

Description:

The majority of the interior lighting throughout Upper Middle School is provided with fluorescent fixtures with older generation, 700 series and 741/ECO 32W T8 lamps and electronic ballasts. Although these T8 lamps are considered fairly efficient, further energy savings can be achieved by replacing the existing T8 lamps with new generation, 800 series 28W T8 lamps without compromising light output. CE recommends, re-lamping all of the fixtures with 28W T8 lamps and in some cases removing a lamp from the fixture due to excessive foot candle levels in specific areas. In addition, the kitchen hood contains incandescent lamps which should be replaced. It is recommended to retrofit or replace all of the older fluorescent fixtures and the incandescent lights in these areas with newer fluorescent fixtures and compact fluorescent lamps.

This ECM includes re-lamping of the existing fluorescent fixtures with 800 series, 28W T8 lamps. The ECM also includes retrofit of all older fluorescent fixtures with T8 or T5 fluorescent fixtures with electronic ballasts in the building. The new, energy efficient T8 fixtures will provide adequate lighting and will save on electrical costs due to better performance of the lamp and ballasts.

The ECM also includes replacement of any incandescent lamps with compact fluorescent lamps. Compact fluorescent lamps (CFL's) were designed to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp. The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light. The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 26-Watt CFL for a 100-Watt incandescent lamp. The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output. A CFL can be chosen to screw right into your existing fixtures, or hardwired into your existing fixtures. Where the existing fixture is controlled by a dimmer switch, the CFL bulb must be compatible with a dimmer switch. In some locations the bulb replacement will need to be tested to make sure the larger base of the CFL will fit into the existing fixture. The energy usage of an incandescent compared to a compact fluorescent approximately 3 to 4 times greater. In addition to the energy savings, compact fluorescent fixtures burn-hours are 8 to 15 times longer than incandescent fixtures ranging from 6,000 to 15,000 burn-hours compared to incandescent fixtures ranging from 750 to 1000 burn-hours. However, the maintenance savings due to reduced lamp replacement is offset by the higher cost of the CFL's compared to the incandescent lamps.

Energy Savings Calculations:

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

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$23,828
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$23,828
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$7,074
Total Yearly Savings ($/Yr):	$7,074
Estimated ECM Lifetime (Yr):	15
Simple Payback	3.4
Simple Lifetime ROI	345.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$106,110
Internal Rate of Return (IRR)	29%
Net Present Value (NPV)	$60,620.95

ECM #2: Lighting Upgrade - Gymnasium

Description:

The main gymnasium at Lower Middle School is currently lit via thirty six HID, 400W, Metal Halide fixtures. The space would be better served with a more efficient, fluorescent lighting system. CE recommends upgrading the lighting to an energy-efficient T-5 lighting system that includes new lighting fixtures with high efficiency, electronic ballasts and T-5 high output (HO) lamps.

This measure replaces all the HID, 400 W HID MH fixtures with a well-designed T-5 lighting system. Thirty six, 4-lamp T5HO high bay fixtures with reflectors and high-efficiency, electronic ballasts 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.

From the **Smart Start Incentive Appendix**, the replacement of a 400 W HID fixture to a T-5 or T-8 fixture warrants the following incentive: $100 per fixture.

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$8,640
NJ Smart Start Equipment Incentive ($):	$3,600
Net Installation Cost ($):	$5,040
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$3,129
Total Yearly Savings ($/Yr):	$3,129
Estimated ECM Lifetime (Yr):	15
Simple Payback	1.6
Simple Lifetime ROI	831.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$46,941
Internal Rate of Return (IRR)	62%
Net Present Value (NPV)	$32,318.81

ECM #3: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the Lower 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.

Emergency lighting is required in corridors and in the Lower Middle School they are left on 24/7 in order to provide illumination for exiting a building in the event of an emergency. These lights are powered by the schools emergency power circuits and remain lit during a power outage. The school has approximately one third of all hallway fixtures setup as an emergency light. The actual number of fixtures should be confirmed in the field. We have recommended an emergency lighting control device which will allow these lights to be controlled along with the standard corridor lighting, thereby limiting their use to occupied hours only.

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)

A report by the EPA (2001) suggests that daylit offices can achieve up to 35%-40% savings, and that other daylit spaces (classrooms, grocery stores, and retail outlets) can achieve 40%-60% savings. Clearly, these savings apply only to perimeter or sky-lit portions of a building's floor space and the percentage of national commercial building floorspace with sufficient levels of daylight to apply automatic daylight dimming is not known.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 40% of the total light energy controlled by daylight sensors.

This ECM includes installation of ceiling or switch mount sensors for individual offices, classrooms, large bathrooms, and Media Centers. In addition, sensors for emergency lighting in the corridors are being integrated as well. 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:

$$\begin{aligned}\text{Smart Start Incentive} &= (\#\ \text{Wall mount sensors} \times \$20\ \text{per sensor}) \\ &+ (\#\ \text{Ceiling mount sensors} \times \$35\ \text{per sensor})\end{aligned}$$

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$37,950
NJ Smart Start Equipment Incentive ($):	$1,090
Net Installation Cost ($):	$36,860
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$13,458
Total Yearly Savings ($/Yr):	$13,458
Estimated ECM Lifetime (Yr):	15
Simple Payback	2.7
Simple Lifetime ROI	447.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$201,870
Internal Rate of Return (IRR)	36%
Net Present Value (NPV)	$123,800.73

ECM #4: Condensing Boiler Installation

Description:

There are two sets of two existing fire tube boilers that are used as the primary source of heat for the Lower Middle School. The existing boilers are beyond half of their life expectancy of typical fire tube boilers; however the equipment appears to be maintained in fair operating condition. Even for boilers that are close to the end of its life it is difficult to predict the point at which the boiler becomes inoperable. With the increased efficiency of the condensing boilers, the savings can be substantial.

New condensing boilers could substantially improve the operating efficiency of the heating system of the building. Condensing boiler's peak efficiency tops out at 99% depending on return water temperature. Due to the operating conditions of the building, the annual average operating efficiency of the proposed condensing boiler is expected to be 88%. The efficiency of the existing boiler's is approximately 77%, which makes the condensing boilers an 11% increase in efficiency. This ECM is based on variable supply water temperature adjusted based on outdoor temperature.

This ECM includes installation of four condensing gas fired boilers to replace the existing fire tube boilers. The basis for this ECM is Aerco condensing boilers; model number BMK - 3.0 and 2.0. The boiler installation is based on a one for one replacement based on capacity of the existing boiler.

Energy Savings Calculations:

Baseline Hot Water Gas Use: 8,487 Therms (From domestic water calculation in ECM 5)

Existing Heating Natural Gas: 53,291 Therms – (8,487 Therms) = 44,804 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)	44,804	0	
Boiler Efficiency (%)	77%	88%	11%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	3,450	3,450	
Gas Cost ($/Therm)	0.94	0.94	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	44,804	39,204	5,601
Energy Cost ($)	$42,116	$36,851	$5,264
COMMENTS:			

From the **NJ Smart Start Appendix**, the installation of new condensing boilers warrants the following incentive: $1.75 per MBH.

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$275,898
NJ Smart Start Equipment Incentive ($):	$10,000
Net Installation Cost ($):	$265,898
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$5,264
Total Yearly Savings ($/Yr):	$5,264
Estimated ECM Lifetime (Yr):	24
Simple Payback	50.5
Simple Lifetime ROI	-52.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$126,336
Internal Rate of Return (IRR)	-5%
Net Present Value (NPV)	($176,749.31)

ECM #5: High Efficiency Gas Hot Water Heater

Description:

The Lower Middle School has three existing gas-fired hot water heaters which are located in the boiler rooms. The heaters are well past their useful life and could be replaced with a much more efficient hot water heating systems.

This ECM will replace the gas-fired domestic water heaters with one AW 286 and two AW 501 Lochinvar Armor Series, 98% thermal efficient Natural Gas fired boilers which are accompanied by separate hot water storage tanks, one 504 gallon and one 318 gallon.

Energy Savings Calculations:

CONDENSING DOM. HOT WATER HEATER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Hot Water Heaters	Lochinvar High Efficiency	
Building Type	Education		
Building Square-foot	127,300	127,300	
Domestic Water Usage, kBtu	661,960.00	661,960.00	
DHW Heating Fuel Type	Gas	Gas	
Heating Efficiency	78%	98%	20%
Total Usage (kBTU)	848,667	675,469	173,197
Nat Gas Cost ($/Therm)	$ 0.940	$ 0.940	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	8,487	6,755	1,732
Energy Cost ($)	$7,977	$6,349	$1,628
COMMENTS:	Savings are based on Energy Information Administration Commercial Building Energy Consumption Survey 2003 Information		

Energy Density for "Education" type building = 5.2 kBtu / SF / year

$$DHW\ Heat\ Usage = Energy\ Density\left(\frac{kBtu\ yr}{SF}\right) \times Building\ Square\ Footage\ (SF)$$

$$DHW\ Total\ Usage = \frac{Dom\ HW\ Heat\ Cons.(Btu)}{Heating\ Eff.(\%) \times Fuel\ Heat\ Value\left(\frac{BTU}{Fuel\ Unit}\right)}$$

$$Energy\ Cost = Heating\ Fuel\ Usage(Fuel\ Units) \times Ave\ Fuel\ Cost\left(\frac{\$}{Fuel\ Unit}\right)$$

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$104,000
NJ Smart Start Equipment Incentive ($):	$2,322
Net Installation Cost ($):	$101,678
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,628
Total Yearly Savings ($/Yr):	$1,628
Estimated ECM Lifetime (Yr):	12
Simple Payback	62.5
Simple Lifetime ROI	-80.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$19,536
Internal Rate of Return (IRR)	-19%
Net Present Value (NPV)	($85,472.88)

ECM #6: Chiller Replacement

Description:

The Lower Middle School currently has two air cooled screw compressor chillers that are approaching their useful life expectancy. There is a 195 ton and 155 ton chiller located on the ground level surrounding the building. The estimated efficiency of the chillers is 1.13 KW/Ton at full load capacity, and an estimated 1.0 kW/Ton at part load.

This ECM includes the installation of two new high efficient variable speed air cooled chillers. The chillers are based on 190 ton and 155 ton York Model YVAA that would replace both chillers. . The owner should have a professional engineer verify heating and cooling loads prior to moving forward with this ECM.

Energy Savings Calculations:

$$Electric\,Usage = Cooling\,Tons \times \left(\frac{kW}{Ton}\right) \times Full\ Load\ Hrs.$$

$$Demand\,Savings = Cooling Tons\, x \left(Existing \frac{kW}{Ton} - \mathrm{Pr}\, oposed \frac{kW}{Ton} \right)$$

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

CHILLER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Air Cooled Chillers	High Efficiency Chiller	
Operating Capacity (Tons)	345.0	345.0	
Chiller Efficiency (KW/Ton)	1.130	1.050	
Full Load Cooling Hrs (Est.)	1,100	1,100	
Cooling Energy (kWh)	428,835	398,475	
Chiller Operating Hours (May to Sept)	3,650	3,650	
Chiller Part Load Hours Est.	1,600	1,600	
Chiller IPLV (KW/Ton)	1.000	0.550	
Chiller Part Load %	30.0%	30.0%	
Part Load Cooling Energy (kWh)	165,600	91,080	
Elec Cost ($/kWh)	0.146	0.146	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	594,435	489,555	104,880
Electric Demand (KW)	389.9	362.3	27.6
Electric Energy Cost ($)	$86,788	$71,475	$15,312
COMMENTS:			

From the **NJ Smart Start® Program appendix**, the unit falls under the category "Electric Chiller" and warrants an incentive based on efficiency (EER) at 1.04 and 1.05 KW/Ton*. The program incentives are calculated as follows:

$$\text{Smart Start®}\ Incentive = (Cooling\ Tons \times\ \$/Ton\ Incentive)$$

*ARI rating used for Smart Start, Manufacturer's data used for comparison purposes.

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$469,000
NJ Smart Start Equipment Incentive ($):	$13,490
Net Installation Cost ($):	$455,510
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$15,312
Total Yearly Savings ($/Yr):	$15,312
Estimated ECM Lifetime (Yr):	20
Simple Payback	29.7
Simple Lifetime ROI	-32.8%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$306,240
Internal Rate of Return (IRR)	-4%
Net Present Value (NPV)	($227,706.10)

ECM #7: Install VFD on Hot Water Pumps

Description:

The hot water system at the Lower Middle School utilizes four constant speed pumps to circulate hot water from the two different boiler plants throughout the building. Based on the survey of the existing equipment it appears that the hot water unit ventilators and air handling units have 3-way control valves for flow control. 3-way control valves allow constant flow of the water loop, requiring full pumping energy continuously, unlike 2-way control valves that provide flow through the heat exchanger equipment only when there is a call for heating, and allow the system to reduce flow when it is not needed.

This ECM includes the installation of Variable Frequency Drives on the two, 5 horsepower pumps in boiler room B-17 and two, 5 horsepower pumps in boiler room F-21. The VFD control is based on a differential pressure sensor in the water loop to measure demand for water. This ECM also includes replacement of the two existing pump motors in the central boiler room with inverter duty motors that meet NEMA Premium Efficiency Standard, which also helps to reduce energy consumption. Additionally, the 3-way control valves must be replaced in all the unit ventilators throughout the system to enable the variable volume system to function properly.

Energy Savings Calculations:

$$\text{Pump Power HP} = \frac{\text{Flow}_{\text{GPM}} \times \text{Head}_{\text{ft-hd.}}}{3650 \times \eta_{\text{Pump}} \times \eta_{\text{motor}}}$$

$$\text{Energy Consumption (kWh)} = \text{Motor HP} \times 0.746 \frac{\text{kW}}{\text{HP}} \times \text{Hours of operation (Hr)} \times \frac{1}{\eta_{\text{motor}}}$$

$$\text{Total Energy Consumption (kWh)} = \sum \text{Energy Consumption of Each Motor}$$

$$\text{Energy Cost (\$)} = \text{Total Comsumption(kWh)} \times \text{Average Cost of Electric} \left(\frac{\$}{\text{kWh}}\right)$$

Affinity Laws are used in order to calculate energy savings by calculating the reduced power consumption requirement based a reduction in flow. Affinity laws, are as following:

Q = Flow, n = RPM, p = total pressure

$$\frac{Q_2}{Q_1} = \frac{n_2}{n_1} \qquad \frac{p_2}{p_1} = \left(\frac{n_2}{n_1}\right)^2 \qquad \frac{HP_2}{HP_1} = \left(\frac{n_2}{n_1}\right)^3$$

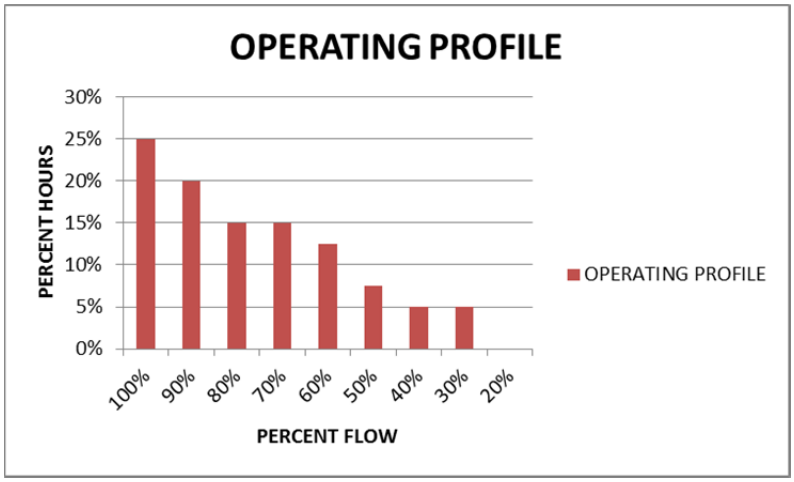
VFD Calculation for 5 Horsepower Pumps in Boiler Room B-17

HOT WATER SET #1 PUMPS VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CV Pumps	VFD Pumps	
Flow Control	Throttle	VFD	-
Motor Nameplate HP	5.0	5.0	
Flow* (GPM)	231	231	-
Head* (Ft)	52	52	-
Pump Efficiency (%)	75.0%	75.0%	-
Motor Efficiency (%)	81.5%	89.5%	8.0%
Operating Hrs	5054	5054	-
Estimated Power (HP)	5.0	4.5	0.44
Elec Cost ($/kWh)	0.146	0.146	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	22,957	11,900	11,057
Electric Energy Cost ($)	$3,352	$1,737	$1,614
COMMENTS:			

VFD Calculation for 5 Horsepower Pumps in Boiler Room F-21

HOT WATER SET #4 PUMPS VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CV Pumps	VFD Pumps	
Flow Control	Throttle	VFD	-
Motor Nameplate HP	5.0	5.0	
Flow* (GPM)	120	120	-
Head* (Ft)	78	78	-
Pump Efficiency (%)	75.0%	75.0%	-
Motor Efficiency (%)	81.5%	89.5%	8.0%
Operating Hrs	5054	5054	-
Estimated Power (HP)	3.9	3.5	0.35
Elec Cost ($/kWh)	0.146	0.146	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	17,889	11,872	6,017
Electric Energy Cost ($)	$2,612	$1,733	$878
COMMENTS:			

Estimated Operating Profile with VFD



Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$278,738
NJ Smart Start Equipment Incentive ($):	$216
Net Installation Cost ($):	$278,522
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,492
Total Yearly Savings ($/Yr):	$2,492
Estimated ECM Lifetime (Yr):	20
Simple Payback	111.8
Simple Lifetime ROI	-82.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$49,840
Internal Rate of Return (IRR)	-13%
Net Present Value (NPV)	($241,447.33)

ECM # 8: Install VFD on Chilled Water Pumps

Description:

The chilled water system at the Lower Middle School utilizes four constant speed pumps to circulate chilled water from the air cooled chillers at the mechanical rooms throughout the building. Based on the survey of the existing equipment it appears that the chilled water air handlers and unit ventilators have 3-way control valves for flow control. 3-way control valves allow constant flow of the water loop, requiring full pumping energy continuously, unlike 2-way control valves that provide flow through the heat exchanger equipment only when there is a call for cooling, and allow the system to reduce flow when it is not needed.

This ECM includes the installation of Variable Frequency Drives on the two 25 horsepower and two 15 horsepower existing chilled water pumps. The VFD control is based on a differential pressure sensor in the water loop to measure demand for water. This ECM also includes replacement of the existing 3-way valves with 2-way valves which enable the system to operate correctly.

Energy Savings Calculations:

$$\text{Pump Power HP} = \frac{\text{Flow}_{\text{GPM}} \times \text{Head}_{\text{ft-hd.}}}{3650 \times \eta_{\text{Pump}} \times \eta_{\text{motor}}}$$

$$\text{Energy Consumption (kWh)} = \text{Motor HP} \times 0.746 \frac{\text{kW}}{\text{HP}} \times \text{Hours of operation (Hr)} \times \frac{1}{\eta_{\text{motor}}}$$

$$\text{Total Energy Consumption (kWh)} = \sum \text{Energy Consumption of Each Motor}$$

$$\text{Energy Cost (\$)} = \text{Total Comsumption(kWh)} \times \text{Average Cost of Electric} \left(\frac{\$}{\text{kWh}}\right)$$

Affinity Laws are used in order to calculate energy savings by calculating the reduced power consumption requirement based a reduction in flow. Affinity laws, are as following:

Q = Flow, n = RPM, p = total pressure

$$\frac{Q_2}{Q_1} = \frac{n_2}{n_1} \qquad \frac{p_2}{p_1} = \left(\frac{n_2}{n_1}\right)^2 \qquad \frac{HP_2}{HP_1} = \left(\frac{n_2}{n_1}\right)^3$$

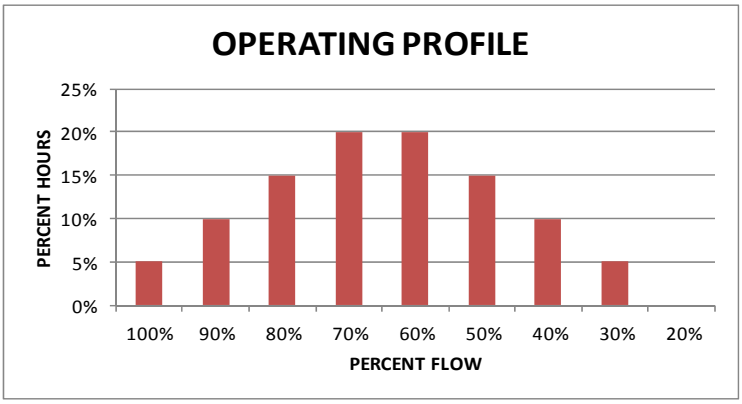
VFD Calculation for 25 HP Pump

CHILLER PUMPS VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CV Pumps	VFD Pumps	
Flow Control	Throttle	VFD	-
Motor Nameplate HP	25.0	25.0	
Flow* (GPM)	600	600	-
Head* (Ft)	106	106	-
Pump Efficiency (%)	75.0%	75.0%	-
Motor Efficiency (%)	94.1%	94.1%	0.0%
Operating Hrs	1105	1105	-
Estimated Power (HP)	22.8	22.8	0.00
Elec Cost ($/kWh)	0.146	0.146	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	19,935	7,402	12,533
Electric Energy Cost ($)	$2,911	$1,081	$1,830
COMMENTS:			

VFD Calculation for 15 HP Pump

CHILLER PUMPS VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CV Pumps	VFD Pumps	
Flow Control	Throttle	VFD	-
Motor Nameplate HP	15.0	15.0	
Flow* (GPM)	294	294	-
Head* (Ft)	105	105	-
Pump Efficiency (%)	75.0%	75.0%	-
Motor Efficiency (%)	93.0%	93.0%	0.0%
Operating Hrs	1105	1105	-
Estimated Power (HP)	11.2	11.2	0.00
Elec Cost ($/kWh)	0.146	0.146	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	9,906	4,494	5,412
Electric Energy Cost ($)	$1,446	$656	$790
COMMENTS:			

Estimated Operating Profile with VFD



Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$283,619
NJ Smart Start Equipment Incentive ($):	$1,942
Net Installation Cost ($):	$281,677
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,620
Total Yearly Savings ($/Yr):	$2,620
Estimated ECM Lifetime (Yr):	20
Simple Payback	107.5
Simple Lifetime ROI	-81.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$52,400
Internal Rate of Return (IRR)	-12%
Net Present Value (NPV)	($242,698.02)

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 systempowerusage 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.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Montgomery Township BOE - Lower Middle School

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^{n_i}}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^{n_i}}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Lighting Upgrade	$23,828	$0	$0	$23,828	$7,074	$0	$7,074	15	$106,110	$0	345.3%	3.4	29.04%	$60,620.95
ECM #2	Gym Lighting Upgrade	$8,640	$0	$3,600	$5,040	$3,129	$0	$3,129	15	$46,941	$0	831.4%	1.6	62.05%	$32,318.81
ECM #3	Lighting Controls Upgrade	$37,950	$0	$1,090	$36,860	$13,458	$0	$13,458	15	$201,870	$0	447.7%	2.7	36.15%	$123,800.73
ECM #4	Boiler Replacement	$184,910	$90,988	$10,000	$265,898	$5,264	$0	$5,264	24	$126,336	$0	-52.5%	50.5	-5.26%	($176,749.31)
ECM #5	Domestic Hot Water Replacement	$64,000	$40,000	$2,322	$101,678	$1,628	$0	$1,628	12	$19,536	$0	-80.8%	62.5	-19.26%	($85,472.88)
ECM #6	Chiller Replacement	$343,500	$125,500	$13,490	$455,510	$15,312	$0	$15,312	20	$306,240	$0	-32.8%	29.7	-3.52%	($227,706.10)
ECM #7	VFD on Hot Water Pumps	$75,173	$203,565	$216	$278,522	$2,492	$0	$2,492	20	$49,840	$0	-82.1%	111.8	-12.73%	($241,447.33)
ECM #8	VFD on Chilled Water Pumps	$79,157	$204,462	$1,942	$281,677	$2,620	$0	$2,620	20	$52,400	$0	-81.4%	107.5	-12.50%	($242,698.02)
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	724.27 KW PV System	$4,312,395	$0	$0	$4,312,395	$124,856	$329,762	$454,618	15	$6,819,268	$4,946,428	58.1%	9.5	6.36%	$1,114,803.40

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 15, 2011:

Electric Chillers

Water-Cooled Chillers	$12 - $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

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Heating

Gas Fired Boilers < 300 MBH	$300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$300 - $400 per unit, AFUE ≥ 92%

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

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	$10 per fixture (1-4 lamps)
Replacement of T12 with new T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities	$25 per fixture (1-4 lamps)
Replacement of incandescent with screw-in PAR 38 or PAR 30 (CFL) bulb	$7 per bulb
T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
Hard-Wired Compact Fluorescent	$25 - $30 per fixture
Metal Halide w/Pulse Start Including Parking Lot	$25 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $200 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 New Exit Sign Fixture Existing Facility < 75 kw Existing Facility > 75 kw	 $20 per fixture $10 per fixture
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 (2x2 Troffers only)	$100 per fixture
LED Fuel Pump Canopy	$100 per fixture
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$42 per 5 foot $65 per 6 foot

Lighting Controls – Occupancy Sensors

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

Lighting Controls – HID or Fluorescent Hi-Bay Controls

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

Premium Motors

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

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2007 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 a IRR of at least 10%.
Multi Measures Bonus	15%

APPENDIX C

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Lower Middle School

Building ID: 1498402
For 12-month Period Ending: December 31, 2011[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: February 16, 2012

Facility
Lower Middle School
373 Burnt Hill Road
Skillman, NJ 08558

Facility Owner
Montgomery Township BOE
1014 Route 601
Skillman, NJ 08558

Primary Contact for this Facility
Thomas Venanzi
1014 Route 601
Skillman, NJ 08558

Year Built: 1999
Gross Floor Area (ft²): 127,300

Energy Performance Rating[2] (1-100) 53

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	5,394,570
Natural Gas (kBtu)[4]	5,334,439
Total Energy (kBtu)	10,729,009

Energy Intensity[4]

Site (kBtu/ft²/yr)	84
Source (kBtu/ft²/yr)	185

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	1,048

Electric Distribution Utility
Public Service Electric & Gas Co

National Median Comparison

National Median Site EUI	86
National Median Source EUI	190
% Difference from National Median Source EUI	-2%
Building Type	K-12 School

Stamp of Certifying Professional

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

Meets Industry Standards[5] **for Indoor Environmental Conditions:**

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

Certifying Professional
John Marchiafava
520 S. Burnt Mill Rd.
Voorhees, NJ 08043

Notes:
1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Values represent energy intensity, annualized to a 12-month period.
5. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Lower 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	373 Burnt Hill Road, Skillman, NJ 08558	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.		☐
Lower Middle School (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	127,300 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Open Weekends?	Yes	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	371	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		☐

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

(LMS) Parking Lot (Parking)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	205,770 Sq. Ft.	Is this the total square footage of the entire parking area (enclosed + nonenclosed + open floor area)?		☐
Enclosed Floor Area	0 Sq. Ft.	Is this the total square footage of the enclosed garage space? An enclosed garage is defined as having both sides and a roof.		☐
Non-Enclosed Floor Area (w/roof)	0 Sq. Ft.	Is this the total square footage of the nonenclosed garage space? This is typically defined as the portion of the garage above ground (contains no sides but is under a roof).		☐
Open Floor Area (w/o roof)	205,770 Sq. Ft.	Is this the total square footage of the nonenclosed parking area without a roof? This is typically defined as open parking lots or the very top level of an above ground parking garage.		☐
Weekly Hours of Access	168 Hours	Is this the total number of hours per week when it is possible for a vehicle to enter or exit?		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Public Service Electric & Gas Co

Fuel Type: Electricity

Meter: E-62-127-217-69 (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
11/08/2011	12/07/2011	111,600.00
10/08/2011	11/07/2011	143,600.00
09/08/2011	10/07/2011	177,600.00
08/08/2011	09/07/2011	116,000.00
07/08/2011	08/07/2011	169,600.00
06/08/2011	07/07/2011	190,000.00
05/08/2011	06/07/2011	158,000.00
04/08/2011	05/07/2011	101,600.00
03/08/2011	04/07/2011	100,400.00
02/08/2011	03/07/2011	110,600.00
01/08/2011	02/07/2011	110,600.00
E-62-127-217-69 Consumption (kWh (thousand Watt-hours))		**1,489,600.00**
E-62-127-217-69 Consumption (kBtu (thousand Btu))		**5,082,515.20**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**5,082,515.20**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: G-62-127-217-69 (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
11/02/2011	12/01/2011	4,966.00
10/02/2011	11/01/2011	1,214.00
09/02/2011	10/01/2011	643.00
08/02/2011	09/01/2011	803.00
07/02/2011	08/01/2011	908.00
06/02/2011	07/01/2011	1,214.00
05/02/2011	06/01/2011	229.00
04/02/2011	05/01/2011	4,468.00
03/02/2011	04/01/2011	4,049.00
02/02/2011	03/01/2011	11,715.00
01/02/2011	02/01/2011	10,431.00

G-62-127-217-69 Consumption (therms)	**40,640.00**
G-62-127-217-69 Consumption (kBtu (thousand Btu))	**4,064,000.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**4,064,000.00**
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
Lower Middle School
373 Burnt Hill Road
Skillman, NJ 08558

Facility Owner
Montgomery Township BOE
1014 Route 601
Skillman, NJ 08558

Primary Contact for this Facility
Thomas Venanzi
1014 Route 601
Skillman, NJ 08558

General Information

Lower Middle School	
Gross Floor Area Excluding Parking: (ft^2)	127,300
Year Built	1999
For 12-month Evaluation Period Ending Date:	December 31, 2011

Facility Space Use Summary

Lower Middle School	
Space Type	K-12 School
Gross Floor Area(ft^2)	127,300
Open Weekends?	Yes
Number of PCs	371
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months°	12
High School?	No
School District°	N/A

(LMS) Parking Lot	
Space Type	Parking
Gross Floor Area(ft^2)	205,770
Enclosed Floor Area	0
Non-Enclosed Floor Area (w/roof)	0
Open Floor Area (w/o roof)	205,770
Weekly Hours of Access	168

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 12/31/2011)	**Baseline** (Ending Date 09/30/2006)	**Rating of 75**	**Target**	**National Median**
Energy Performance Rating	53	33	75	N/A	50
Energy Intensity					
Site (kBtu/ft^2)	84	90	69	N/A	86
Source (kBtu/ft^2)	185	212	152	N/A	190
Energy Cost					
$/year	N/A	N/A	N/A	N/A	N/A
$/$ft^2$/year	N/A	N/A	N/A	N/A	N/A
Greenhouse Gas Emissions					
$MtCO_2e$/year	1,048	1,187	860	N/A	1,075
$kgCO_2e/ft^2$/year	8	9	7	N/A	8

More than 50% of your building is defined as K-12 School. Please note that your rating accounts for all of the spaces listed. The National 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.

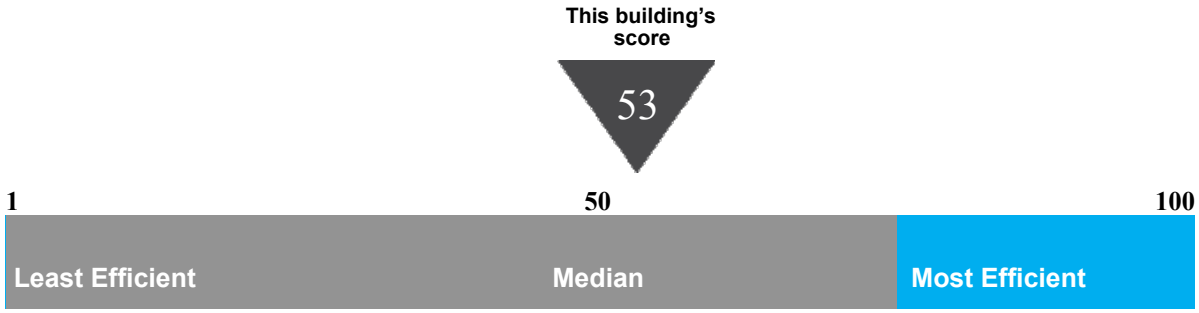
Statement of Energy Performance

2011

Lower Middle School
373 Burnt Hill Road
Skillman, NJ 08558

Portfolio Manager Building ID: 1498402

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 185 kBtu per square foot per year.*

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

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 02/16/2012

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

Montgomery Township Schools - Lower Middle School

AHUs

Tag			
Unit Type	Air Handling Unit		
Qty	-		
Location	Mechanical Areas		
Area Served	Large Rooms		
Manufacturer	McQuay		
Model #	W0589243		
Serial #	97A0004500		
Cooling Type	30% Glycol		
Cooling Capacity (Tons)	Vary		
Cooling Efficiency (SEER/EER)	Vary		
Heating Type	Hot Water		
Heating Input (MBH)	Vary		
Efficiency	-		
Fuel	Hot Water		
Approx Age	1		
ASHRAE Service Life	15		
Remaining Life	14		
Comments			

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

Montgomery Township Schools - Lower Middle School

Boilers

Tag	B-1,2	B-3,4	
Unit Type	Gas Fired Boiler	Gas Fired Boiler	
Qty	2	2	
Location	Boiler Room "B"	Boiler Room "F"	
Area Served	HW Loop	HW Loop	
Manufacturer	Burnham	Burnham	
Model #	3W-70-50-G0-BNM	3W-60-50-G0-BNM	
Serial #	24274	24271	
Input Capacity (Btu/Hr)	2,930	2,500	
Rated Output Capacity (Btu/Hr)	2,343	2,009	
Approx. Efficiency %	80.0%	80.4%	
Fuel	Nat Gas	Nat Gas	
Approx Age	15	15	
ASHRAE Service Life	25	25	
Remaining Life	10	10	
Comments	Burham Burner - KFC1C-762-G02	Burham Burner - KFC1C-782-G02	

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

Montgomery Township Schools - Lower Middle School

Chiller

Tag	ACC-1	ACC-2	
Unit Type	Air Cooled Screw Chiller	Air Cooled Screw Chiller	
Qty	1	1	
Location	Outside on Grade	Outside on Grade	
Area Served	Chiller Water Loop	Chiller Water Loop	
Manufacturer	McQuay	McQuay	
Model #	ALS195A	ALS155A	
Serial #	56M8134101	56M8133501	
Refrigerant	R-22	R-22	
Cooling Capacity (Tons)	190 Tons	155 Tons	
Cooling Efficiency (KW/Ton)	1.13 Kw/Ton	1.1 Kw/Ton	
Volts / Phase / Hz	460/3/60	460/3/60	
Fuel	Unknown	Unknown	
Chilled Water GPM / ΔT	Unknown	Unknown	
Condenser Water GPM / ΔT	Unknown	Unknown	
Approx Age	15	15	
ASHRAE Service Life	20	20	
Remaining Life	5	5	
Comments	Screw Compressor	Screw Compressor	

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Montgomery Township Schools - Lower Middle School

Domestic Water Heaters

Tag	WH-1	WH-2	WH-3
Unit Type	Domestic Hot Water	Domestic Hot Water	Domestic Hot Water
Qty	1	1	1
Location	Boiler Room	Boiler Room	Boiler Room
Area Served	Domestic Loop	Domestic Loop	Domestic Loop
Manufacturer	A.O. Smith	A.O. Smith	A.O. Smith
Model #	BTP 300-300	BTP 300-300	BTP 200-800
Serial #	SM96-65383-Y3	SM96-65383-Y3	SM96-64992-Y3
Size (Gallons)	300 Gallons	300 Gallons	200 Gallons
Input Capacity (MBH/KW)	300 MBH	300 MBH	800 MBH
Recovery (Gal/Hr)	291 GPH	291 GPH	776 GPH
Efficiency %	78%	78%	78%
Fuel	Nat Gas	Nat Gas	Nat Gas
Approx Age	15	15	15
ASHRAE Service Life	12	12	12
Remaining Life	(3)	(3)	(3)
Comments			

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Montgomery Township Schools - Lower Middle School

Pumps

Tag	P-5,5A	P-6,6A	P-1,2
Unit Type	End Suction	End Suction	End Suction
Qty	2	2	2
Location	Boiler Room	Boiler Room	Boiler Room
Area Served			
Manufacturer	Taco	Taco	Taco
Model #	FI3013E2LAJ2L0A	FI2510E2HAJ2L0A	Frame 184T
Serial #	EC69219/1	EC69219/6	F196
Horse Power	25 HP	15 HP	5
Flow	600 GPM @ 106 FTHD	294 GPM @ 105 FTHD	231 GPM @ 52 FTHD
Motor Info	Baldor	Baldor	Baldor
Electrical Power	230/460/3/60	230/460/3/60	208/230/460/3
RPM	1770 RPM	1765 RPM	1725
Motor Efficiency %	94.1%	93.0%	81.50%
Approx Age	1	1	15
ASHRAE Service Life	20	20	20
Remaining Life	19	19	5
Comments			

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

Montg

Pumps

Tag	P-3,4		
Unit Type	End Suction		
Qty	2		
Location	Boiler Room		
Area Served			
Manufacturer	Taco		
Model #	EM2513T		
Serial #			
Horse Power	5		
Flow	120 GPM @ 78 FTHD		
Motor Info	Baldor		
Electrical Power	208/230/460/3%		
RPM	1765		
Motor Efficiency %	81.50%		
Approx Age	15		
ASHRAE Service Life	20		
Remaining Life	5		
Comments			

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

APPENDIX E

Investment Grade Lighting Audit

CEG Job #: 9C11058

Project: Montgomery Twp. LGEA **Lower Montgomery Middle School** **KWH COST: $0.146**

Bldg. Sq. Ft.

ECM 1&2: Lighting Upgrade - General & Gym

EXISTING LIGHTING										PROPOSED LIGHTING										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Classroom A 1	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 2	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 3	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 4	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 7	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 8	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 9	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 10	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 12	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 13	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 14	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom A 6	2600	12	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.25	3,244.8	$473.74	12	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.03	2683.2	$391.75	$22.00	$264.00	0.22	561.6	$81.99	3.22
242.211	A 11 Guidance	2600	6	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.62	1,622.4	$236.87	6	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.52	1341.6	$195.87	$22.00	$132.00	0.11	280.8	$41.00	3.22

Investment Grade Lighting Audit

ECM 1&2: Lighting Upgrade - General & Gym

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Commons & Hall - A	3000	22	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	2.29	6,864.0	$1,002.14	22	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.89	5676	$828.70	$22.00	$484.00	0.40	1188	$173.45	2.79
242.211	Commons & Hall - A	8760	10	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.04	9,110.4	$1,330.12	10	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.86	7533.6	$1,099.91	$22.00	$220.00	0.18	1576.8	$230.21	0.96
221.11	Elec. Room	1200	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	148.8	$21.72	2	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.10	120	$17.52	$14.00	$28.00	0.02	28.8	$4.20	6.66
227.21	Restrooms	2600	2	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.13	338.0	$49.35	2	2	Sylvania Lamp FBO30/841XP/6//SS/ECO	49	0.10	254.8	$37.20	$24.00	$48.00	0.03	83.2	$12.15	3.95
222.21	Men's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806.0	$117.68	5	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$94.90	$14.00	$70.00	0.06	156	$22.78	3.07
222.21	Women's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806.0	$117.68	5	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$94.90	$14.00	$70.00	0.06	156	$22.78	3.07
221.11	Custodial Closet	1200	1	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.05	60	$8.76	$14.00	$14.00	0.01	14.4	$2.10	6.66
563	Main Lobby	3000	23	3	Recessed Down Light, (3)18w Twin PL Lamp	58	1.33	4,002.0	$584.29	23	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Green House Hall	2600	9	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.77	2,012.4	$293.81	9	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.65	1684.8	$245.98	$21.00	$189.00	0.13	327.6	$47.83	3.95
242.211	Classroom B 1	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 2	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 3	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 5	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 6	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 7	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 8	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 11	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22

Investment Grade Lighting Audit

ECM 1&2: Lighting Upgrade - General & Gym

EXISTING LIGHTING										PROPOSED LIGHTING										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Classroom B 12	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 13	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 14	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom B 4	2600	6	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.62	1,622.4	$236.87	6	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.52	1341.6	$195.87	$22.00	$132.00	0.11	280.8	$41.00	3.22
242.211	Classroom B 8	2600	8	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.83	2,163.2	$315.83	8	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.69	1788.8	$261.16	$22.00	$176.00	0.14	374.4	$54.66	3.22
242.211	Commons & Hall - B	3000	22	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	2.29	6,864.0	$1,002.14	22	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.89	5676	$828.70	$22.00	$484.00	0.40	1188	$173.45	2.79
242.211	Commons & Hall - B	8760	10	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.04	9,110.4	$1,330.12	10	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.86	7533.6	$1,099.91	$22.00	$220.00	0.18	1576.8	$230.21	0.96
221.11	Elec. Room	1200	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	148.8	$21.72	2	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.10	120	$17.52	$14.00	$28.00	0.02	28.8	$4.20	6.66
227.21	Restrooms	2600	2	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.13	338.0	$49.35	2	2	Sylvania Lamp FBO30/841XP/6//SS/ECO	49	0.10	254.8	$37.20	$24.00	$48.00	0.03	83.2	$12.15	3.95
222.21	Men's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806.0	$117.68	5	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$94.90	$14.00	$70.00	0.06	156	$22.78	3.07
222.21	Women's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806.0	$117.68	5	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$94.90	$14.00	$70.00	0.06	156	$22.78	3.07
221.11	Custodial Closet	1200	1	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.05	60	$8.76	$14.00	$14.00	0.01	14.4	$2.10	6.66
221.34	Mech Room	1200	8	2	1x4, 2 Lamp, 32w 741/ECO T8, Elect. Ballast, Pendant Mnt., No Lens	62	0.50	595.2	$86.90	8	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.40	480	$70.08	$14.00	$112.00	0.10	115.2	$16.82	6.66
242.211	Classroom C 2	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 3	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22

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ECM 1&2: Lighting Upgrade - General & Gym

EXISTING LIGHTING										PROPOSED LIGHTING										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Classroom C 4	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 6	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 7	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 8	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 9	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 11	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 12	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 13	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 14	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 15	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2,433.6	$355.31	9	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.77	2012.4	$293.81	$22.00	$198.00	0.16	421.2	$61.50	3.22
242.211	Classroom C 10	2600	6	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.62	1,622.4	$236.87	6	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.52	1341.6	$195.87	$22.00	$132.00	0.11	280.8	$41.00	3.22
242.211	Commons & Hall - C	3000	22	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	2.29	6,864.0	$1,002.14	22	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.89	5676	$828.70	$22.00	$484.00	0.40	1188	$173.45	2.79
242.211	Commons & Hall - C	8760	10	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.04	9,110.4	$1,330.12	10	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.86	7533.6	$1,099.91	$22.00	$220.00	0.18	1576.8	$230.21	0.96
221.11	Elec. Room	1200	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	148.8	$21.72	2	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.10	120	$17.52	$14.00	$28.00	0.02	28.8	$4.20	6.66

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EXISTING LIGHTING										PROPOSED LIGHTING										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
227.21	Restrooms	2600	2	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.13	338.0	$49.35	2	2	Sylvania Lamp FBO30/841XP/6//SS/ECO	49	0.10	254.8	$37.20	$24.00	$48.00	0.03	83.2	$12.15	3.95
222.21	Men's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806.0	$117.68	5	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$94.90	$14.00	$70.00	0.06	156	$22.78	3.07
222.21	Women's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806.0	$117.68	5	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$94.90	$14.00	$70.00	0.06	156	$22.78	3.07
221.11	Custodial Closet	1200	1	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.05	60	$8.76	$14.00	$14.00	0.01	14.4	$2.10	6.66
222.21	Men's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	390	$56.94	$14.00	$42.00	0.04	93.6	$13.67	3.07
222.21	Custodial Closet	1200	1	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.05	60	$8.76	$14.00	$14.00	0.01	14.4	$2.10	6.66
222.21	Women's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	390	$56.94	$14.00	$42.00	0.04	93.6	$13.67	3.07
242.211	Classroom D 4	2600	20	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	2.08	5,408.0	$789.57	20	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.72	4472	$652.91	$22.00	$440.00	0.36	936	$136.66	3.22
232.21	Classroom D 6	2600	20	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.72	4,472.0	$652.91	20	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.44	3744	$546.62	$21.00	$420.00	0.28	728	$106.29	3.95
232.21	D 6 Work Room	2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	894.4	$130.58	4	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.29	748.8	$109.32	$21.00	$84.00	0.06	145.6	$21.26	3.95
242.211	Classroom D 1	2600	18	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.87	4,867.2	$710.61	18	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.55	4024.8	$587.62	$22.00	$396.00	0.32	842.4	$122.99	3.22
232.22	Classroom D 2	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	86	1.03	2,683.2	$391.75	12	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.86	2246.4	$327.97	$21.00	$252.00	0.17	436.8	$63.77	3.95
242.211	Classroom D 3	2600	12	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.25	3,244.8	$473.74	12	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.03	2683.2	$391.75	$22.00	$264.00	0.22	561.6	$81.99	3.22
221.34	Classroom D 14	2600	36	2	1x4, 2 Lamp, 32w 741/ECO T8, Elect. Ballast, Pendant Mnt., No Lens	62	2.23	5,803.2	$847.27	36	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	1.80	4680	$683.28	$14.00	$504.00	0.43	1123.2	$163.99	3.07
221.37	Classroom D 5	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	58	0.93	2,412.8	$352.27	16	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.80	2080	$303.68	$14.00	$224.00	0.13	332.8	$48.59	4.61
232.21	MC1	2600	6	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.52	1,341.6	$195.87	6	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.43	1123.2	$163.99	$21.00	$126.00	0.08	218.4	$31.89	3.95

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ECM 1&2: Lighting Upgrade - General & Gym

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
221.34	Media Center	2600	50	2	1x4, 2 Lamp, 32w 741/ECO T8, Elect. Ballast, Pendant Mnt., No Lens	62	3.10	8,060.0	$1,176.76	50	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	2.50	6500	$949.00	$14.00	$700.00	0.60	1560	$227.76	3.07
560		2600	26	2	Recessed Down Light, 26w Quad PL Lamp	52	1.35	3,515.2	$513.22	26	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21		2600	14	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.91	2,366.0	$345.44	14	2	Sylvania Lamp FBO30/841XP/6//SS/ECO	49	0.69	1783.6	$260.41	$24.00	$336.00	0.22	582.4	$85.03	3.95
232.21	Work Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.69	1,788.8	$261.16	8	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.58	1497.6	$218.65	$21.00	$168.00	0.11	291.2	$42.52	3.95
232.21	Classroom D 7	2600	19	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.63	4,248.4	$620.27	19	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.37	3556.8	$519.29	$21.00	$399.00	0.27	691.6	$100.97	3.95
232.21	Classroom D 8	2600	19	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.63	4,248.4	$620.27	19	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.37	3556.8	$519.29	$21.00	$399.00	0.27	691.6	$100.97	3.95
232.21	Work Room	2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	894.4	$130.58	4	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.29	748.8	$109.32	$21.00	$84.00	0.06	145.6	$21.26	3.95
232.21	Classroom D 9	2600	18	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.55	4,024.8	$587.62	18	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.30	3369.6	$491.96	$21.00	$378.00	0.25	655.2	$95.66	3.95
560		2600	4	2	Recessed Down Light, 26w Quad PL Lamp	52	0.21	540.8	$78.96	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Classroom D 10	2600	18	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.55	4,024.8	$587.62	18	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	1.30	3369.6	$491.96	$21.00	$378.00	0.25	655.2	$95.66	3.95
560		2600	4	2	Recessed Down Light, 26w Quad PL Lamp	52	0.21	540.8	$78.96	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	D9 Closet	1200	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	206.4	$30.13	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	172.8	$25.23	$21.00	$42.00	0.03	33.6	$4.91	8.56
232.21	Kiln	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$65.29	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$54.66	$21.00	$42.00	0.03	72.8	$10.63	3.95
232.21	Classroom D 11	2600	10	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.86	2,236.0	$326.46	10	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.72	1872	$273.31	$21.00	$210.00	0.14	364	$53.14	3.95
222.21	Women's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	390	$56.94	$14.00	$42.00	0.04	93.6	$13.67	3.07
222.21	Men's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	390	$56.94	$14.00	$42.00	0.04	93.6	$13.67	3.07
232.21	Elec. Room	1200	3	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.26	309.6	$45.20	3	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.22	259.2	$37.84	$21.00	$63.00	0.04	50.4	$7.36	8.56
227.21	Lobby	3000	60	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	3.90	11,700.0	$1,708.20	60	2	Sylvania Lamp FBO30/841XP/6//SS/ECO	49	2.94	8820	$1,287.72	$24.00	$1,440.00	0.96	2880	$420.48	3.42
242.22	Man Office	2600	11	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.14	2,974.4	$434.26	11	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.95	2459.6	$359.10	$28.00	$308.00	0.20	514.8	$75.16	4.10

Investment Grade Lighting Audit

ECM 1&2: Lighting Upgrade - General & Gym

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.22	Hall	2600	8	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.83	2,163.2	$315.83	8	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.69	1788.8	$261.16	$28.00	$224.00	0.14	374.4	$54.66	4.10
242.22	Copy Room	2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.52	1,352.0	$197.39	5	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.43	1118	$163.23	$28.00	$140.00	0.09	234	$34.16	4.10
242.22	Work Room	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.17	447.2	$65.29	$28.00	$56.00	0.04	93.6	$13.67	4.10
242.22	VP Office	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1,081.6	$157.91	4	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.34	894.4	$130.58	$28.00	$112.00	0.07	187.2	$27.33	4.10
242.22	Conf. Room	2600	6	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.62	1,622.4	$236.87	6	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.52	1341.6	$195.87	$28.00	$168.00	0.11	280.8	$41.00	4.10
242.22	Principal's Office	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1,081.6	$157.91	4	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.34	894.4	$130.58	$28.00	$112.00	0.07	187.2	$27.33	4.10
242.22	Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.17	447.2	$65.29	$28.00	$56.00	0.04	93.6	$13.67	4.10
242.22	Testing	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1,081.6	$157.91	4	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.34	894.4	$130.58	$28.00	$112.00	0.07	187.2	$27.33	4.10
242.22	Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.17	447.2	$65.29	$28.00	$56.00	0.04	93.6	$13.67	4.10
242.22	Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.17	447.2	$65.29	$28.00	$56.00	0.04	93.6	$13.67	4.10
242.22	Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.17	447.2	$65.29	$28.00	$56.00	0.04	93.6	$13.67	4.10
242.22	Reception	2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.52	1,352.0	$197.39	5	4	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.43	1118	$163.23	$28.00	$140.00	0.09	234	$34.16	4.10
769	Gym	2600	36	1	400w MH, Clear Lens	465	16.74	43,524.0	$6,354.50	36	4	2x4 54w T5HO 4 Lamp w/Prismatic Lens	236	8.50	22089.6	$3,225.08	$240.00	$8,640.00	8.24	21434.4	$3,129.42	2.76
232.21	Girl's Locker Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.69	1,788.8	$261.16	8	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.58	1497.6	$218.65	$21.00	$168.00	0.11	291.2	$42.52	3.95
232.21	Girl's Locker Room Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$65.29	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$54.66	$21.00	$42.00	0.03	72.8	$10.63	3.95
232.21	Boy's Locker Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.69	1,788.8	$261.16	8	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.58	1497.6	$218.65	$21.00	$168.00	0.11	291.2	$42.52	3.95
232.21	Boy's Locker Room Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$65.29	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$54.66	$21.00	$42.00	0.03	72.8	$10.63	3.95
242.211	Gym Lobby	2600	7	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.73	1,892.8	$276.35	7	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.60	1565.2	$228.52	$22.00	$154.00	0.13	327.6	$47.83	3.22
2	Café	2600	48	2	2x2 2 Lamp 40w Biax Lamp	88	4.22	10,982.4	$1,603.43	48	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
2	Café	2600	16	2	2x2 2 Lamp 40w Biax Lamp	88	1.41	3,660.8	$534.48	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM 1&2: Lighting Upgrade - General & Gym

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Serving	2600	15	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.56	4,056.0	$592.18	15	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.29	3354	$489.68	$22.00	$330.00	0.27	702	$102.49	3.22
227.21		2600	6	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.39	1,014.0	$148.04	6	2	Sylvania Lamp FBO30/841XP/6//SS/ECO	49	0.29	764.4	$111.60	$24.00	$144.00	0.10	249.6	$36.44	3.95
617	Kitchen Hood	2600	2	1	Hood Light w/Globe & Cage, 100w A Lamp	100	0.20	520.0	$75.92	2	1	26w CFL Lamp	26	0.05	135.2	$19.74	$20.00	$40.00	0.15	384.8	$56.18	0.71
221.31	Receiving	2600	11	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.68	1,773.2	$258.89	11	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.55	1430	$208.78	$14.00	$154.00	0.13	343.2	$50.11	3.07
222.21	Women's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806.0	$117.68	5	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.25	650	$94.90	$14.00	$70.00	0.06	156	$22.78	3.07
221.11	Custodial Closet	1200	1	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.05	60	$8.76	$14.00	$14.00	0.01	14.4	$2.10	6.66
222.21	Men's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	0.15	390	$56.94	$14.00	$42.00	0.04	93.6	$13.67	3.07
242.211	E1 Band	2600	15	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.56	4,056.0	$592.18	15	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.29	3354	$489.68	$22.00	$330.00	0.27	702	$102.49	3.22
242.211	E2	2600	15	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.56	4,056.0	$592.18	15	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.29	3354	$489.68	$22.00	$330.00	0.27	702	$102.49	3.22
242.211	Practice Rooms (2)	1200	8	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.83	998.4	$145.77	8	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	0.69	825.6	$120.54	$22.00	$176.00	0.14	172.8	$25.23	6.98
232.21	Nurse	2600	6	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.52	1,341.6	$195.87	6	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.43	1123.2	$163.99	$21.00	$126.00	0.08	218.4	$31.89	3.95
232.21	Nurse's Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$65.29	2	3	Relamp - Sylvania Lamp FO28/841/SS/ECO	72	0.14	374.4	$54.66	$21.00	$42.00	0.03	72.8	$10.63	3.95
221.37	Classroom D 13	2600	20	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	58	1.16	3,016.0	$440.34	20	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	1.00	2600	$379.60	$14.00	$280.00	0.16	416	$60.74	4.61
221.37	Classroom D 12	2600	23	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	58	1.33	3,468.4	$506.39	23	2	Relamp - Sylvania Lamp FO28/841/SS/ECO	50	1.15	2990	$436.54	$14.00	$322.00	0.18	478.4	$69.85	4.61
242.211	Corridor - D	3000	36	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	3.74	11,232.0	$1,639.87	36	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	3.10	9288	$1,356.05	$22.00	$792.00	0.65	1944	$283.82	2.79
242.211	Corridor - D	8760	12	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.25	10,932.5	$1,596.14	12	3	Remove 1 Lamp, Relamp - Syl Lamp FO28/841/SS/ECO, Provide 95% Alum. Reflector	86	1.03	9040.32	$1,319.89	$22.00	$264.00	0.22	1892.16	$276.26	0.96
725	Exterior	4000	16	1	150w HPS Wallpack	188	3.01	12,032.0	$1,756.67	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
	Totals		1,295	412				353,645	$51,632	1,295	348			92.4	258,057	$37,676		$32,204	26.4	72,346	$10,563	3.05

CEG Job #: 9C11058
Project: Montgomery Twp. LGEA
Address: 0
0
Building SF: -

Lower Montgomery Middle School

KWH COST: $0.146

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS											SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Classroom A 1	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 2	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 3	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 4	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 7	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 8	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 9	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 10	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 12	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 13	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 14	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom A 6	2600	12	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.25	3244.8	$473.74	12	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	1.00	20%	2595.84	$378.99	$300.00	$300.00	0.25	648.96	$94.75	3.17
242.211	A 11 Guidance	2600	6	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.62	1622.4	$236.87	6	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.50	20%	1297.92	$189.50	$300.00	$300.00	0.12	324.48	$47.37	6.33
242.211	Commons & Hall - A	3000	22	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	2.29	6864	$1,002.14	22	3	Dual Technology Occupancy Sensor - Remote Mnt.	104	1.83	20%	5491.2	$801.72	$300.00	$900.00	0.46	1372.8	$200.43	4.49
242.211	Commons & Hall - A	8760	10	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.04	9110.4	$1,330.12	10	1	Watt Stopper ELCU Emergency Lighting Control Unit	104	0.31	70%	2733.12	$399.04	$600.00	$600.00	0.73	6377.28	$931.08	0.64

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
221.11	Elec. Room	1200	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	148.8	$21.72	2	0	No Change	62	0.12	0%	148.8	$21.72	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Restrooms	2600	2	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.13	338	$49.35	2	0	No Change	65	0.13	0%	338	$49.35	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Men's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806	$117.68	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.25	20%	644.8	$94.14	$150.00	$150.00	0.06	161.2	$23.54	6.37
222.21	Women's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806	$117.68	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.25	20%	644.8	$94.14	$150.00	$150.00	0.06	161.2	$23.54	6.37
221.11	Custodial Closet	1200	1	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	0	No Change	62	0.06	0%	74.4	$10.86	$0.00	$0.00	0.00	0	$0.00	0.00
563	Main Lobby	3000	23	3	Recessed Down Light, (3)18w Twin PL Lamp	58	1.33	4002	$584.29	23	2	Dual Technology Occupancy Sensor - Remote Mnt.	58	1.07	20%	3201.6	$467.43	$300.00	$600.00	0.27	800.4	$116.86	5.13
232.21	Green House Hall	2600	9	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.77	2012.4	$293.81	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	86	0.62	20%	1609.92	$235.05	$300.00	$300.00	0.15	402.48	$58.76	5.11
242.211	Classroom B 1	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 2	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 3	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 5	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 6	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 7	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 8	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 11	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 12	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS											SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Classroom B 13	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 14	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom B 4	2600	6	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.62	1622.4	$236.87	6	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.50	20%	1297.92	$189.50	$300.00	$300.00	0.12	324.48	$47.37	6.33
242.211	Classroom B 8	2600	8	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.83	2163.2	$315.83	8	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.67	20%	1730.56	$252.66	$300.00	$300.00	0.17	432.64	$63.17	4.75
242.211	Commons & Hall - B	3000	22	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	2.29	6864	$1,002.14	22	3	Dual Technology Occupancy Sensor - Remote Mnt.	104	1.83	20%	5491.2	$801.72	$300.00	$900.00	0.46	1372.8	$200.43	4.49
242.211	Commons & Hall - B	8760	10	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.04	9110.4	$1,330.12	10	1	Watt Stopper ELCU Emergency Lighting Control Unit	104	0.31	70%	2733.12	$399.04	$600.00	$600.00	0.73	6377.28	$931.08	0.64
221.11	Elec. Room	1200	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	148.8	$21.72	2	0	No Change	62	0.12	0%	148.8	$21.72	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Restrooms	2600	2	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.13	338	$49.35	2	0	No Change	65	0.13	0%	338	$49.35	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Men's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806	$117.68	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.25	20%	644.8	$94.14	$150.00	$150.00	0.06	161.2	$23.54	6.37
222.21	Women's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806	$117.68	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.25	20%	644.8	$94.14	$150.00	$150.00	0.06	161.2	$23.54	6.37
221.11	Custodial Closet	1200	1	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	0	No Change	62	0.06	0%	74.4	$10.86	$0.00	$0.00	0.00	0	$0.00	0.00
221.34	Mech Room	1200	8	2	1x4, 2 Lamp, 32w 741/ECO T8, Elect. Ballast, Pendant Mnt., No Lens	62	0.50	595.2	$86.90	8	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.40	20%	476.16	$69.52	$150.00	$150.00	0.10	119.04	$17.38	8.63
242.211	Classroom C 2	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 3	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 4	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 6	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Classroom C 7	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 8	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 9	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 11	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 12	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 13	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 14	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 15	2600	9	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.94	2433.6	$355.31	9	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.75	20%	1946.88	$284.24	$300.00	$300.00	0.19	486.72	$71.06	4.22
242.211	Classroom C 10	2600	6	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.62	1622.4	$236.87	6	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.50	20%	1297.92	$189.50	$300.00	$300.00	0.12	324.48	$47.37	6.33
242.211	Commons & Hall - C	3000	22	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	2.29	6864	$1,002.14	22	3	Dual Technology Occupancy Sensor - Remote Mnt.	104	1.83	20%	5491.2	$801.72	$300.00	$900.00	0.46	1372.8	$200.43	4.49
242.211	Commons & Hall - C	8760	10	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.04	9110.4	$1,330.12	10	1	Watt Stopper ELCU Emergency Lighting Control Unit	104	0.31	70%	2733.12	$399.04	$600.00	$600.00	0.73	6377.28	$931.08	0.64
221.11	Elec. Room	1200	2	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	148.8	$21.72	2	0	No Change	62	0.12	0%	148.8	$21.72	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Restrooms	2600	2	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.13	338	$49.35	2	0	No Change	65	0.13	0%	338	$49.35	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Men's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806	$117.68	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.25	20%	644.8	$94.14	$150.00	$150.00	0.06	161.2	$23.54	6.37
222.21	Women's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806	$117.68	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.25	20%	644.8	$94.14	$150.00	$150.00	0.06	161.2	$23.54	6.37
221.11	Custodial Closet	1200	1	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	0	No Change	62	0.06	0%	74.4	$10.86	$0.00	$0.00	0.00	0	$0.00	0.00

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS											SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
222.21	Men's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.15	20%	386.88	$56.48	$150.00	$150.00	0.04	96.72	$14.12	10.62
222.21	Custodial Closet	1200	1	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	0	No Change	62	0.06	0%	74.4	$10.86	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Women's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.15	20%	386.88	$56.48	$150.00	$150.00	0.04	96.72	$14.12	10.62
242.211	Classroom D 4	2600	20	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	2.08	5408	$789.57	20	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	104	1.66	20%	4326.4	$631.65	$450.00	$450.00	0.42	1081.6	$157.91	2.85
232.21	Classroom D 6	2600	20	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.72	4472	$652.91	20	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	86	1.38	20%	3577.6	$522.33	$450.00	$450.00	0.34	894.4	$130.58	3.45
232.21	D 6 Work Room	2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	894.4	$130.58	4	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.28	20%	715.52	$104.47	$150.00	$150.00	0.07	178.88	$26.12	5.74
242.211	Classroom D 1	2600	18	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.87	4867.2	$710.61	18	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	104	1.50	20%	3893.76	$568.49	$450.00	$450.00	0.37	973.44	$142.12	3.17
232.22	Classroom D 2	2600	12	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	86	1.03	2683.2	$391.75	12	1	Dual Technology Occupancy Sensor - Remote Mnt.	86	0.83	20%	2146.56	$313.40	$300.00	$300.00	0.21	536.64	$78.35	3.83
242.211	Classroom D 3	2600	12	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.25	3244.8	$473.74	12	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	1.00	20%	2595.84	$378.99	$300.00	$300.00	0.25	648.96	$94.75	3.17
221.34	Classroom D 14	2600	36	2	1x4, 2 Lamp, 32w 741/ECO T8, Elect. Ballast, Pendant Mnt., No Lens	62	2.23	5803.2	$847.27	36	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	62	1.79	20%	4642.56	$677.81	$450.00	$450.00	0.45	1160.64	$169.45	2.66
221.37	Classroom D 5	2600	16	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	58	0.93	2412.8	$352.27	16	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	58	0.74	20%	1930.24	$281.82	$450.00	$450.00	0.19	482.56	$70.45	6.39
232.21	MC1	2600	6	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.52	1341.6	$195.87	6	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.41	20%	1073.28	$156.70	$150.00	$150.00	0.10	268.32	$39.17	3.83
221.34	Media Center	2600	50	2	1x4, 2 Lamp, 32w 741/ECO T8, Elect. Ballast, Pendant Mnt., No Lens	62	3.10	8060	$1,176.76	50	2	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	62	2.48	20%	6448	$941.41	$450.00	$900.00	0.62	1612	$235.35	3.82
560		2600	26	2	Recessed Down Light, 26w Quad PL Lamp	52	1.35	3515.2	$513.22	26	1	Dual Technology Occupancy Sensor - Remote Mnt.	52	1.08	20%	2812.16	$410.58	$300.00	$300.00	0.27	703.04	$102.64	2.92
227.21		2600	14	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.91	2366	$345.44	14	1	Dual Technology Occupancy Sensor - Remote Mnt.	65	0.73	20%	1892.8	$276.35	$300.00	$300.00	0.18	473.2	$69.09	4.34
232.21	Work Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.69	1788.8	$261.16	8	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.55	20%	1431.04	$208.93	$150.00	$150.00	0.14	357.76	$52.23	2.87

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
232.21	Classroom D 7	2600	19	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.63	4248.4	$620.27	19	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	86	1.31	20%	3398.72	$496.21	$450.00	$450.00	0.33	849.68	$124.05	3.63
232.21	Classroom D 8	2600	19	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.63	4248.4	$620.27	19	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	86	1.31	20%	3398.72	$496.21	$450.00	$450.00	0.33	849.68	$124.05	3.63
232.21	Work Room	2600	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	894.4	$130.58	4	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.28	20%	715.52	$104.47	$150.00	$150.00	0.07	178.88	$26.12	5.74
232.21	Classroom D 9	2600	18	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.55	4024.8	$587.62	18	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	86	1.24	20%	3219.84	$470.10	$450.00	$450.00	0.31	804.96	$117.52	3.38
560		2600	4	2	Recessed Down Light, 26w Quad PL Lamp	52	0.21	540.8	$78.96	4			52	0.17	20%	432.64	$63.17			0.04	108.16	$15.79	
232.21	Classroom D 10	2600	18	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	1.55	4024.8	$587.62	18	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	86	1.24	20%	3219.84	$470.10	$450.00	$450.00	0.31	804.96	$117.52	3.38
560		2600	4	2	Recessed Down Light, 26w Quad PL Lamp	52	0.21	540.8	$78.96	4			52	0.17	20%	432.64	$63.17			0.04	108.16	$15.79	
232.21	D9 Closet	1200	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	206.4	$30.13	2	0	No Change	86	0.17	0%	206.4	$30.13	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Kiln	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$65.29	2	0	No Change	86	0.17	0%	447.2	$65.29	$0.00	$0.00	0.00	0	$0.00	0.00
232.21	Classroom D 11	2600	10	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.86	2236	$326.46	10	1	Dual Technology Occupancy Sensor - Remote Mnt.	86	0.69	20%	1788.8	$261.16	$300.00	$300.00	0.17	447.2	$65.29	4.59
222.21	Women's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.15	20%	386.88	$56.48	$150.00	$150.00	0.04	96.72	$14.12	10.62
222.21	Men's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.15	20%	386.88	$56.48	$150.00	$150.00	0.04	96.72	$14.12	10.62
232.21	Elec. Room	1200	3	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.26	309.6	$45.20	3	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.21	20%	247.68	$36.16	$150.00	$150.00	0.05	61.92	$9.04	16.59
227.21	Lobby	3000	60	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	3.90	11700	$1,708.20	60	3	Dual Technology Occupancy Sensor - Remote Mnt.	65	3.12	20%	9360	$1,366.56	$300.00	$900.00	0.78	2340	$341.64	2.63
242.22	Man Office	2600	11	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	1.14	2974.4	$434.26	11	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.92	20%	2379.52	$347.41	$300.00	$300.00	0.23	594.88	$86.85	3.45
242.22	Hall	2600	8	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.83	2163.2	$315.83	8	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.67	20%	1730.56	$252.66	$300.00	$300.00	0.17	432.64	$63.17	4.75

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.22	Copy Room	2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.52	1352	$197.39	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.42	20%	1081.6	$157.91	$150.00	$150.00	0.10	270.4	$39.48	3.80
242.22	Work Room	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.17	20%	432.64	$63.17	$150.00	$150.00	0.04	108.16	$15.79	9.50
242.22	VP Office	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1081.6	$157.91	4	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.33	20%	865.28	$126.33	$150.00	$150.00	0.08	216.32	$31.58	4.75
242.22	Conf. Room	2600	6	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.62	1622.4	$236.87	6	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.50	20%	1297.92	$189.50	$150.00	$150.00	0.12	324.48	$47.37	3.17
242.22	Principal's Office	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1081.6	$157.91	4	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.33	20%	865.28	$126.33	$150.00	$150.00	0.08	216.32	$31.58	4.75
242.22	Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.17	20%	432.64	$63.17	$150.00	$150.00	0.04	108.16	$15.79	9.50
242.22	Testing	2600	4	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.42	1081.6	$157.91	4	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.33	20%	865.28	$126.33	$150.00	$150.00	0.08	216.32	$31.58	4.75
242.22	Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.17	20%	432.64	$63.17	$150.00	$150.00	0.04	108.16	$15.79	9.50
242.22	Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.17	20%	432.64	$63.17	$150.00	$150.00	0.04	108.16	$15.79	9.50
242.22	Office	2600	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.21	540.8	$78.96	2	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.17	20%	432.64	$63.17	$150.00	$150.00	0.04	108.16	$15.79	9.50
242.22	Reception	2600	5	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	104	0.52	1352	$197.39	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.42	20%	1081.6	$157.91	$150.00	$150.00	0.10	270.4	$39.48	3.80
769	Gym	2600	36	1	400w MH, Clear Lens	465	16.74	43524	$6,354.50	36	3	Dual Technology Occupancy Sensor - Remote Mnt.	465	13.39	20%	34819.2	$5,083.60	$300.00	$900.00	3.35	8704.8	$1,270.90	0.71
232.21	Girl's Locker Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.69	1788.8	$261.16	8	1	Dual Technology Occupancy Sensor - Remote Mnt.	86	0.55	20%	1431.04	$208.93	$300.00	$300.00	0.14	357.76	$52.23	5.74
232.21	Girl's Locker Room Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$65.29	2	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.14	20%	357.76	$52.23	$150.00	$150.00	0.03	89.44	$13.06	11.49
232.21	Boy's Locker Room	2600	8	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.69	1788.8	$261.16	8	1	Dual Technology Occupancy Sensor - Remote Mnt.	86	0.55	20%	1431.04	$208.93	$300.00	$300.00	0.14	357.76	$52.23	5.74
232.21	Boy's Locker Room Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$65.29	2	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.14	20%	357.76	$52.23	$150.00	$150.00	0.03	89.44	$13.06	11.49

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS											SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.211	Gym Lobby	2600	7	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.73	1892.8	$276.35	7	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	0.58	20%	1514.24	$221.08	$300.00	$300.00	0.15	378.56	$55.27	5.43
2	Café	2600	48	2	2x2 2 Lamp 40w Biax Lamp	88	4.22	10982.4	$1,603.43	48	3	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	88	3.38	20%	8785.92	$1,282.74	$450.00	$1,350.00	0.84	2196.48	$320.69	4.21
2	Café	2600	16	2	2x2 2 Lamp 40w Biax Lamp	88	1.41	3660.8	$534.48	16	1	Daylight Sensor (Sensorswitch PP-20 & CM-PC or equal)	88	0.84	40%	2196.48	$320.69	$300.00	$300.00	0.56	1464.32	$213.79	1.40
242.211	Serving	2600	15	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.56	4056	$592.18	15	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	1.25	20%	3244.8	$473.74	$300.00	$300.00	0.31	811.2	$118.44	2.03
227.21		2600	6	2	2x2, 2 Lamp, 32w 700 series T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.39	1014	$148.04	6			65	0.31	20%	811.2	$118.44			0.08	202.8	$29.61	
617	Kitchen Hood	2600	2	1	Hood Light w/Globe & Cage, 100w A Lamp	100	0.20	520	$75.92	2	0	No Change	100	0.20	0%	520	$75.92	$0.00	$0.00	0.00	0	$0.00	0.00
221.31	Receiving	2600	11	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Pendant Mnt., Prismatic Lens	62	0.68	1773.2	$258.89	11	1	Dual Technology Occupancy Sensor - Remote Mnt.	62	0.55	20%	1418.56	$207.11	$300.00	$300.00	0.14	354.64	$51.78	5.79
222.21	Women's Room	2600	5	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	806	$117.68	5	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.25	20%	644.8	$94.14	$150.00	$150.00	0.06	161.2	$23.54	6.37
221.11	Custodial Closet	1200	1	2	1x4, 2 Lamp, 32w 700 Series T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	74.4	$10.86	1	0	No Change	62	0.06	0%	74.4	$10.86	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Men's Room	2600	3	2	2x4, 2 Lamp, 32w &41/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	483.6	$70.61	3	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.15	20%	386.88	$56.48	$150.00	$150.00	0.04	96.72	$14.12	10.62
242.211	E1 Band	2600	15	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.56	4056	$592.18	15	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	1.25	20%	3244.8	$473.74	$300.00	$300.00	0.31	811.2	$118.44	2.53
242.211	E2	2600	15	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.56	4056	$592.18	15	1	Dual Technology Occupancy Sensor - Remote Mnt.	104	1.25	20%	3244.8	$473.74	$300.00	$300.00	0.31	811.2	$118.44	2.53
242.211	Practice Rooms (2)	1200	8	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	0.83	998.4	$145.77	8	2	Dual Technology Occupancy Sensor - Switch Mnt.	104	0.67	20%	798.72	$116.61	$150.00	$300.00	0.17	199.68	$29.15	10.29
232.21	Nurse	2600	6	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.52	1341.6	$195.87	6	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.41	20%	1073.28	$156.70	$150.00	$150.00	0.10	268.32	$39.17	3.83
232.21	Nurse's Office	2600	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	447.2	$65.29	2	1	Dual Technology Occupancy Sensor - Switch Mnt.	86	0.14	20%	357.76	$52.23	$150.00	$150.00	0.03	89.44	$13.06	11.49
221.37	Classroom D 13	2600	20	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	58	1.16	3016	$440.34	20	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	58	0.93	20%	2412.8	$352.27	$450.00	$450.00	0.23	603.2	$88.07	5.11

ECM ##: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
221.37	Classroom D 12	2600	23	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	58	1.33	3468.4	$506.39	23	1	Dual Tech. Occupancy Sensor w/2 Pole Powerpack Remote Mnt.	58	1.07	20%	2774.72	$405.11	$450.00	$450.00	0.27	693.68	$101.28	4.44
242.211	Corridor - D	3000	36	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	3.74	11232	$1,639.87	36	5	Dual Technology Occupancy Sensor - Remote Mnt.	104	3.00	20%	8985.6	$1,311.90	$300.00	$1,500.00	0.75	2246.4	$327.97	4.57
242.211	Corridor - D	8760	12	4	2x4, 4 Lamp, 32w 741/ECO T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	104	1.25	10932.48	$1,596.14	12	1	Watt Stopper ELCU Emergency Lighting Control Unit	104	0.37	70%	3279.744	$478.84	$600.00	$600.00	0.87	7652.736	$1,117.30	0.54
725	Exterior	4000	16	1	150w HPS Wallpack	188	3.01	12032	$1,756.67	16	0	No Change	188	3.01	0%	12032	$1,756.67	$0.00	$0.00	0.00	0	$0.00	0.00
	Totals		1,295	412			131.8	376,609.7	$54,985	1,323	132			103.9		284,431.3	$41,526.98		$37,950	27.89	92,178	$13,458	2.82

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
Lower Middle School	47250	SHARP NU-U235F2	3082	17.5	54,060	724.27	855,180	586.7	129,136	13.40