



## **Crossroads South Middle School, NJ**

### **ENERGY AUDIT – FINAL REPORT CEG PROJECT NO. 9C08134**

**SOUTH BRUNSWICK BOARD OF EDUCATION  
PO BOX 181  
MONMOUTH JUNCTION, NJ 08852  
ATTN: MR. ANTHONY TONZINI  
BUSINESS ADMINSTRATOR**

### **CONCORD ENGINEERING GROUP**



**520 SOUTH BURNT MILL ROAD  
VOORHEES, NJ 08043  
TELEPHONE: (856) 427-0200  
FACSIMILE: (856) 427-6529  
[WWW.CEG-INC.NET](http://WWW.CEG-INC.NET)**

#### **CONTACTS:**

**MICHAEL FISCHETTE  
[MFISCHETTE@CEG-INC.NET](mailto:MFISCHETTE@CEG-INC.NET)**

## Table of Contents

I.	EXECUTIVE SUMMARY .....	3
II.	INTRODUCTION .....	7
III.	METHOD OF ANALYSIS.....	8
IV.	HISTORIC ENERGY CONSUMPTION/COST.....	10
A.	Energy Usage / Tariffs .....	10
B.	Energy Use Intensity (EUI) .....	15
C.	EPA Energy Benchmarking System .....	16
V.	FACILITY DESCRIPTION .....	18
VI.	MAJOR EQUIPMENT LIST .....	21
VII.	ENERGY CONSERVATION MEASURE (ECM).....	22
VIII.	RENEWABLE/DISTRIBUTED ENERGY MEASURES .....	22
IX.	ENERGY PURCHASING AND PROCUREMENT STRATEGY .....	31
X.	INSTALLATION FUNDING OPTIONS.....	35
XI.	ADDITIONAL RECOMMENDATIONS .....	37

Appendix A – Detailed Cost Breakdown per ECM

Appendix B – New Jersey Smart Start<sup>®</sup> Program Incentives

Appendix C – Major Equipment List

Appendix D – Portfolio Manager “Statement of Energy Performance”

Appendix E – Investment Grade Lighting Audit

Appendix F – Renewable / Distributed Energy Measures Calculations

Appendix G - Trane Trace 700<sup>™</sup> building simulation outputs

**REPORT DISCLAIMER**

The information contained within this report, including any attachment(s), is intended solely for use by the named addressee(s). If you are not the intended recipient, or a person designated as responsible for delivering such messages to the intended recipient, you are not authorized to disclose, copy, distribute or retain this report, in whole or in part, without written authorization from Concord Engineering Group, Inc., 520 S. Burnt Mill Road, Voorhees, NJ 08043.

This report may contain proprietary, confidential or privileged information. If you have received this report in error, please notify the sender immediately. Thank you for your anticipated cooperation.

## I. EXECUTIVE SUMMARY

This report presents the findings of an energy audit conducted for:

Crossroads South Middle School  
195 Major Road  
Monmouth Junction, NJ 08852

Municipal Contact: Anthony Tonzini (Board Administrator)

This audit was performed in connection with the New Jersey Clean Energy Local Government Energy Audit Program. These energy audits are conducted to promote the office of Clean Energy's mission, which is to use innovation and technology to solve energy and environmental problems in a way that improves the State's economy. This can be achieved through the wiser and more efficient use of energy.

The annual energy costs at this facility are as follows:

Electricity	\$ 259,603
Natural Gas	\$ 132,762
Total	\$ 392,365

The potential annual energy cost savings are shown below in Table 1. Be aware that the measures are not additive because of the interrelation of several of the measures. The cost of each measure for this level of auditing is  $\pm 20\%$  until detailed engineering, specifications, and hard proposals are obtained.

**Table 1  
Energy Conservation Measures (ECM's)**

<b>ENERGY CONSERVATION MEASURES (ECM's)</b>					
<b>ECM NO.</b>	<b>DESCRIPTION</b>	<b>NET INSTALLATION COST<sup>A</sup></b>	<b>ANNUAL SAVINGS<sup>B</sup></b>	<b>SIMPLE PAYBACK (Yrs)</b>	<b>SIMPLE LIFETIME ROI</b>
ECM #1	VARIABLE SPEED PUMPS	\$139,936	\$19,358	7.2	56.0%
ECM #2	CONTROL MODIFICATIONS	\$28,000	\$24,800	1.1	971.4%
ECM #3	CAFETERIA ROOFTOP UNIT REPLACEMENT	\$162,000	\$31,262	5.2	145.0%
ECM #4	STAGE ROOFTOP UNIT REPLACEMENT	\$63,055	\$8,866	7.1	53.8%
ECM #5	CLEAVER BROOKS BOILER REPLACEMENT	\$136,250	\$21,098	6.5	10765.3%
ECM #6	WEIL MCLAIN BOILER REPLACEMENT	\$161,500	\$46,528	3.5	10870.9%
ECM #7	HIGH EFFICIENCY FAN MOTORS	\$12,938	\$500	25.9	1.5%
<b>RENEWABLE ENERGY MEASURES (REM's)</b>					
<b>ECM NO.</b>	<b>DESCRIPTION</b>	<b>NET INSTALLATION COST</b>	<b>ANNUAL SAVINGS</b>	<b>SIMPLE PAYBACK (Yrs)</b>	<b>SIMPLE LIFETIME ROI</b>
REM #1	440 KW SOLAR PV	\$3,978,540	\$342,168	11.6	-36.7%

**Notes:** A. Cost takes into consideration applicable NJ Smart Start<sup>TM</sup> incentives.  
 B. Savings takes into consideration applicable maintenance savings.

The estimated demand and energy savings are shown below in Table 2. The information in this table corresponds to the ECM's in Table 1.

**Table 2  
Estimated Energy Savings**

<b>ENERGY CONSERVATION MEASURES (ECM's)</b>				
<b>ECM NO.</b>	<b>DESCRIPTION</b>	<b>ANNUAL UTILITY REDUCTION</b>		
		<b>ELECTRIC DEMAND (KW)</b>	<b>ELECTRIC CONSUMPTION (KWH)</b>	<b>NATURAL GAS (THERMS)</b>
ECM #1	VARIABLE SPEED PUMPS	19	97,049	0
ECM #2	CONTROL MODIFICATIONS	0	19,232	7,385
ECM #3	CAFETERIA ROOFTOP UNIT REPLACEMENT	35	315,968	-12,314
ECM #4	STAGE ROOFTOP UNIT REPLACEMENT	31	55,147	-1,063
ECM #5	CLEAVER BROOKS BOILER REPLACEMENT	11	57,404	4522
ECM #6	WEIL MCLAIN BOILER REPLACEMENT	24	153,251	11,023
ECM #7	HIGH EFFICIENCY FAN MOTORS	1	3,598	0
<b>RENEWABLE ENERGY MEASURES (REM's)</b>				
<b>ECM NO.</b>	<b>DESCRIPTION</b>	<b>ANNUAL UTILITY REDUCTION</b>		
		<b>ELECTRIC DEMAND (KW)</b>	<b>ELECTRIC CONSUMPTION (KWH)</b>	<b>NATURAL GAS (THERMS)</b>
REM #1	440 KW SOLAR PV	440	689,855	0

**Recommendations:**

Concord Engineering Group recommends the implementation of all ECM's that provide a calculated simple payback at or under ten (10) years. The potential energy and cost savings from these ECM's are economically justifiable. The following Energy Conservation Measures are recommended for the Crossroads South Middle School:

- **ECM #1:** Variable Speed HW Pumps
- **ECM #2:** Control Modifications
- **ECM #3:** Cafeteria Rooftop Unit Replacement
- **ECM #4:** Stage Rooftop Unit Replacement
- **ECM #5:** Cleaver Brooks Boiler Replacement
- **ECM #6:** Weil McLain Boiler Replacement

## II. INTRODUCTION

This comprehensive energy audit covers the Crossroads South Middle School located at 195 Major Road, Monmouth Junction, NJ. Based on our survey and the documentation available, it was determined that the building area is approximately 190,000 SF.

The first task was to collect and review one year's worth of utility energy data for electricity and natural gas. This information was used to analyze operational characteristics, calculate energy benchmarks for comparison to industry averages, estimate savings potential, and establish a baseline to monitor the effectiveness of implemented measures. A computer spreadsheet was used to enter, sum, and calculate benchmarks and to graph utility information (see Appendix A).

The Energy Use Intensity (EUI) is expressed in British Thermal Units/square foot/year (BTU/ft<sup>2</sup>/yr) and can be used to compare energy consumption to similar building types or to track consumption from year to year in the same building. The EUI is calculated by converting annual consumption of all fuels to BTU's then dividing by the area (gross square footage) of the building. EUI is a good indicator of the relative potential for energy savings. A comparatively low EUI indicates less potential for large energy savings. Blueprints (where available) were obtained from the school district and were utilized to calculate/verify the gross area of the facility.

After gathering the utility data and calculating the EUI, the next step in the audit process is obtaining Architectural and Engineering drawings (where available). By reviewing the Architectural and Engineering drawings, questions regarding the building envelope, lighting systems/controls, HVAC equipment and controls are noted. These questions are then compared to the energy usage profiles developed during the utility data gathering step. Furthermore, through the review of the architectural and engineering drawings a building profile can be defined that documents building age, type, usage, major energy consuming equipment or systems, etc. After this information is gathered the next step in the process is the site visit.

The site visit was spent inspecting the actual systems and answering specific questions from the preliminary review. The building manager provided occupancy schedules, O & M practices, the building energy management program, and other information that has an impact on energy consumption.

The post-site work includes evaluation of the information gathered during the site visit, researching possible conservation opportunities, organizing the audit into a comprehensive report, and making recommendations on mechanical, lighting and building envelope improvements.

### III. METHOD OF ANALYSIS

CEG completed the preliminary audit tasks noted in Section II preparing for the site survey. The site survey is a critical input in deciphering where energy opportunities exist within a facility. The auditor walks the entire site to inventory the building envelope (roof, windows, etc.), the heating, ventilation, and air conditioning equipment (HVAC), the lighting equipment, other facility-specific equipment, and to gain an understanding of how each facility is used.

The collected data is then processed using energy engineering calculations, Microsoft Excel spread sheets and Trane Trace 700™ building simulation software that calculate the anticipated energy usage for the proposed energy conservation measures (ECM's). The actual energy usage is entered directly from the utility bills provided by the Owner. The anticipated energy usage is compared to the actual usage to determine energy savings for the proposed ECM's.

It is pertinent to note, that the savings noted in this report are not duplicative. The savings for each recommendation may actually be higher if the individual recommendations were installed instead of the entire project. For example, the lighting module calculates the change in wattage and multiplies it by the new operating hours instead of the existing operating hours (if there was a change in the hours at all). The lighting controls module calculates the change in hours and multiplies it by the new system wattage instead of the existing wattage. Therefore, if you chose to install the recommended lighting system but not the lighting controls, the savings achieved with the new lighting system would actually be higher because there would have been no reduction in the hours of use.

The same principal follows for heating, cooling, and temperature recommendations – even with fuel switching. If there are recommendations to change the temperature settings to reduce fuel use, then the savings for the heating/cooling equipment recommendations are reduced, as well.

Our thermal module calculates the savings for temperature reductions utilizing automated engineering calculations within Microsoft Excel™ spreadsheets and Trane Trace 700™ building simulation software. The savings are calculated in “output” values – meaning energy, not fuel savings. To show fuel savings we multiply the energy values times the fuel conversion factor (these factors are different for electricity, natural gas, fuel oil, etc.) and also take into account the heating/cooling equipment efficiency. The temperature recommendation savings are lower when the heating/cooling equipment is more efficient or is using a cheaper fuel.

Thermal recommendations (insulation, windows, etc.) are evaluated by taking the difference in the thermal load due to reduced heat transfer. Again, the “thermal load” is the thermal load after the other recommendations have been accounted for.

Lastly, installation costs, refer to Appendix B, are then applied to each recommendation and simple paybacks are calculated. Costs are derived from Means Cost Data, other industry publications, and local contractors and suppliers. The NJ SmartStart Building® program incentives (refer to Appendix C) are calculated for the appropriate ECM's and subtracted from the installed cost prior to calculation of the simple payback. In addition, where applicable, maintenance cost savings are estimated and applied to the net savings. Simple return on

investment is calculated using the standard formula of the difference of gains minus investments, divided by the investments. Included within the gains are the annual energy savings, utility incentives and maintenance savings as a total sum. The calculation is completed assuming the project is 100% direct purchased by the Owner with an energy cost escalation of 2.4% for natural gas and 2.2% for electricity.

#### IV. HISTORIC ENERGY CONSUMPTION/COST

##### A. Energy Usage / Tariffs

###### Electric

Table 3 and Figure 1 represent the electrical usage for the surveyed facility from June-07 to May-08. PSE&G Electric Utility provides electricity to the facility. This electric rate has a component for consumption that is measured in kilowatt-hours (kWh). It is calculated by multiplying the wattage of the equipment times the hours that it operates. For example, a 1,000 Watt lamp operating for 5 hours would measure 5,000 Watt-hours. Since one kilowatt is equal to 1,000 Watts, the measured consumption would be 5 kWh. 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 most current rate structure available.

###### Natural Gas

Table 4 and Figure 2 show the natural gas energy usage from June-07 to May-08. Below is the average unit cost for the utilities at this facility. PSE&G Gas Utility supplies the natural gas and delivers the fuel to the burner at the facility. Below is the average unit cost for the utilities at this facility.

<u>Description</u>	<u>Average</u>
Electricity	14.6¢ / kWh (4.3¢ / kBtu)
*Natural Gas	\$1.72 / therm (1.7¢ / kBtu)

\*Note: The Natural Gas cost per Therm includes customer service charges.

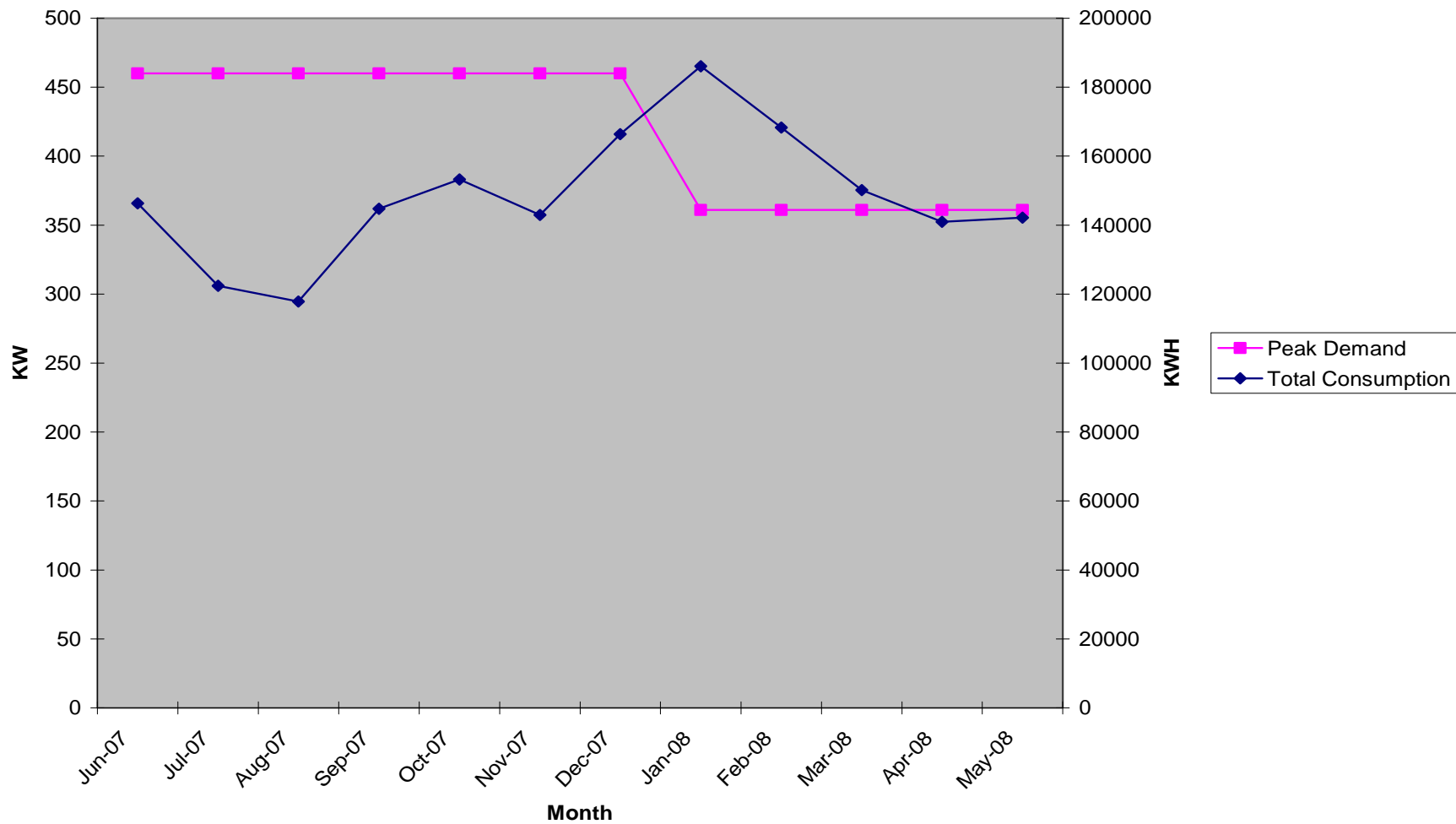
**Table 3  
Electricity Billing Data**

**Crossroads South Middle School Main Meter**

Provider	Month	Start Date	End Date	Account	Utility Type	Billing Days	Peak Demand	Units	Off Peak Usage	Units	On Peak Usage	Units	Total Consumption	Units	Total \$
PSE&G Co (14101)	Jun-07	6/1/2007	7/2/2007	6205597314	Electric	30	460	kw	50193	kwh	94880	kwh	146292	kwh	\$ 27,693.54
PSE&G Co (14101)	Jul-07	7/2/2007	8/1/2007	6205597314	Electric	31	460	kw	47489	kwh	74057	kwh	122433	kwh	\$ 22,914.63
PSE&G Co (14101)	Aug-07	8/1/2007	8/30/2007	6205597314	Electric	31	460	kw	44274	kwh	73543	kwh	117817	kwh	\$ 22,613.13
PSE&G Co (14101)	Sep-07	8/30/2007	10/1/2007	6205597314	Electric	30	460	kw	49247	kwh	95493	kwh	144740	kwh	\$ 28,015.73
PSE&G Co (14101)	Oct-07	10/1/2007	10/30/2007	6205597314	Electric	31	460	kw	48046	kwh	105220	kwh	153266	kwh	\$ 19,932.26
PSE&G Co (14101)	Nov-07	10/30/2007	11/30/2007	6205597314	Electric	30	460	kw	54623	kwh	88319	kwh	142942	kwh	\$ 18,202.17
PSE&G Co (14101)	Dec-07	11/30/2007	1/2/2008	6205597314	Electric	31	460	kw	71412	kwh	94953	kwh	166365	kwh	\$ 20,502.09
PSE&G Co (14101)	Jan-08	1/2/2008	2/2/2008	6205597314	Electric	31	361	kw	72324	kwh	113777	kwh	186101	kwh	\$ 22,991.31
PSE&G Co (14101)	Feb-08	2/2/2008	3/3/2008	6205597314	Electric	29	361	kw	67069	kwh	101258	kwh	168327	kwh	\$ 21,597.65
PSE&G Co (14101)	Mar-08	3/3/2008	4/3/2008	6205597314	Electric	31	361	kw	64270	kwh	85938	kwh	150208	kwh	\$ 18,901.76
PSE&G Co (14101)	Apr-08	4/3/2008	5/1/2008	6205597314	Electric	30	361	kw	48015	kwh	92937	kwh	140952	kwh	\$ 17,896.21
PSE&G Co (14101)	May-08	5/1/2008	6/2/2008	6205597314	Electric	31	361	kw	51051	kwh	91126	kwh	142177	kwh	\$ 18,342.41
<b>Max Peak:</b>							460	kw	<b>12 Month Total:</b>			1,781,620	kwh	\$ 259,602.89	
														<b>Avg. Cost per kwh:</b>	\$ 0.146
														<b>Avg. Cost per kBtu:</b>	\$ 0.043

**Figure 1**  
**Electricity Usage Profile**

**Crossroads South Middle School**



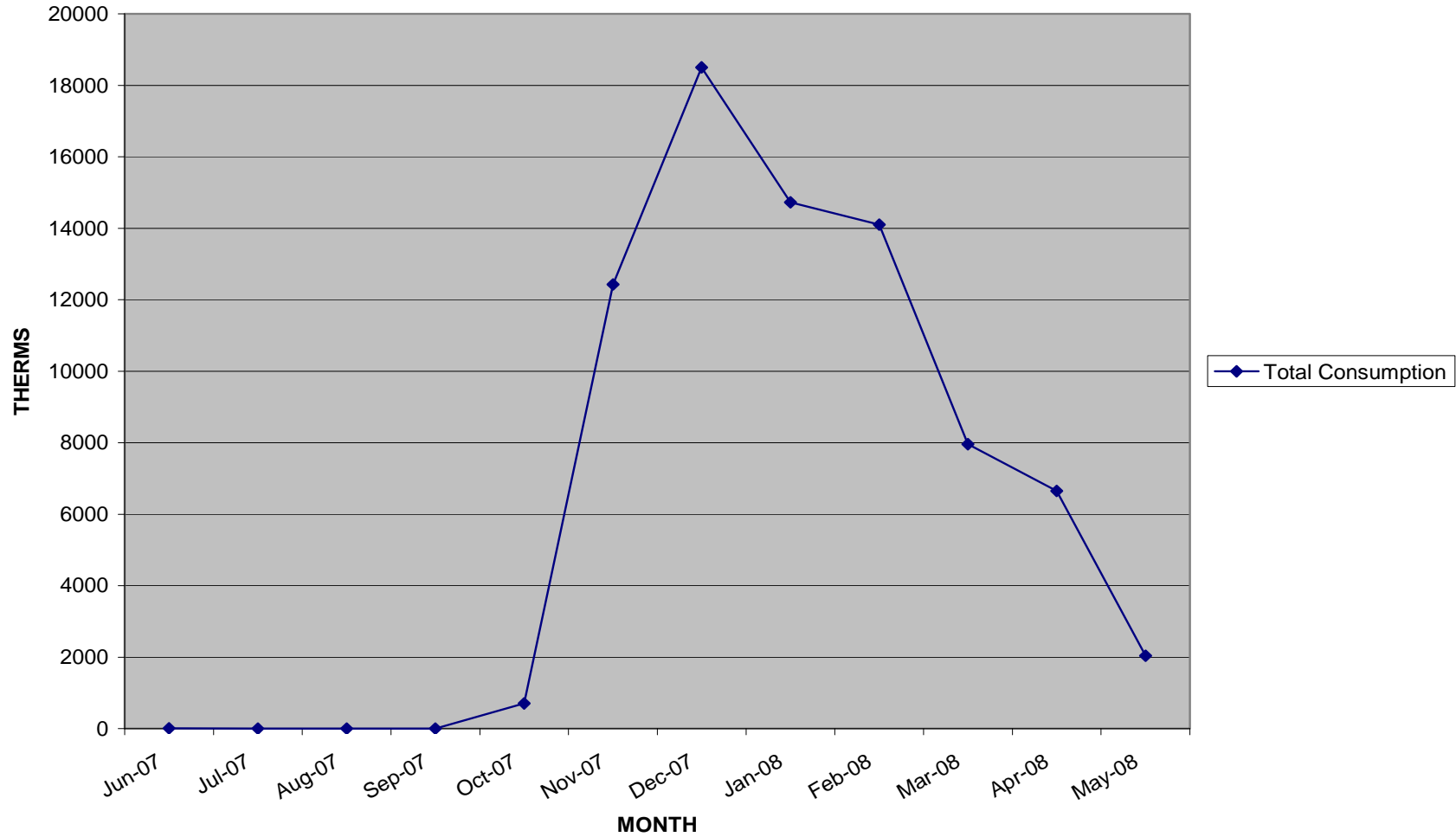
**Table 4  
Natural Gas Billing Data**

**Crossroads South Middle School      Meter #1 & 2 Combined**

Provider	Month	Start Date	End Date	Account	Utility Type	Billing Days	Consumption	Units	Total \$
PSE&G CO (14105)	Jun-07	6/6/2007	7/6/2007	Meter #1 & 2	Gas	30	10	therms	\$ 200.92
PSE&G CO (14105)	Jul-07	7/6/2007	8/6/2007	Meter #1 & 2	Gas	31	0	therms	\$ 184.06
PSE&G CO (14105)	Aug-07	8/6/2007	9/6/2007	Meter #1 & 2	Gas	31	0	therms	\$ 185.74
PSE&G CO (14105)	Sep-07	9/6/2007	10/4/2007	Meter #1 & 2	Gas	28	0	therms	\$ 184.06
PSE&G CO (14105)	Oct-07	10/4/2007	11/2/2007	Meter #1 & 2	Gas	29	700	therms	\$ 2,337.52
PSE&G CO (14105)	Nov-07	11/2/2007	12/5/2007	Meter #1 & 2	Gas	33	12430	therms	\$ 21,807.89
PSE&G CO (14105)	Dec-07	12/5/2007	1/7/2008	Meter #1 & 2	Gas	33	18500	therms	\$ 31,748.21
PSE&G CO (14105)	Jan-08	1/7/2008	2/5/2008	Meter #1 & 2	Gas	29	14730	therms	\$ 25,722.22
PSE&G CO (14105)	Feb-08	2/5/2008	3/6/2008	Meter #1 & 2	Gas	30	14100	therms	\$ 24,719.94
PSE&G CO (14105)	Mar-08	3/6/2008	4/8/2008	Meter #1 & 2	Gas	33	7960	therms	\$ 12,183.96
PSE&G CO (14105)	Apr-08	4/8/2008	5/6/2008	Meter #1 & 2	Gas	28	6650	therms	\$ 10,212.17
PSE&G CO (14105)	May-08	5/6/2008	6/5/2008	Meter #1 & 2	Gas	30	2040	therms	\$ 3,275.34
<b>12 Month Total:</b>							77,120	therms	\$ 132,762.03
<b>Average Cost per therm:</b>							\$ 1.72		
* Meter #1 - 6207329317		* Meter #2 - 6204911716							
<b>Average Cost per KBtu:</b>							\$0.0172		

**Figure 2**  
**Natural Gas Usage Profile**

**Crossroads South - Meter #1 & 2**



B. Energy Use Intensity (EUI)

The Oak Ridge National Laboratory (ORNL) Buildings Technology Center under a contract with the U.S. Department of Energy maintains a Benchmarking Building Energy Performance Program. Their website allows the user to determine how well the client’s building Energy Use Intensity compares with similar facilities throughout the U.S. and in your specific region or state.

Energy Use Intensity (EUI) is a measure of a building’s energy utilization per square foot of building. This calculation is completed by converting all utility usage (gas, electric, oil) consumed by a building over a specified time period, typically one year, to British Thermal Units (BTU) and dividing this number by the building square footage. The EUI for this facility is calculated as follows:

$$\text{Building EUI} = \frac{(\text{Electric Usage in kBtu} + \text{Gas Usage in kBtu})}{\text{Building Square Footage}}$$

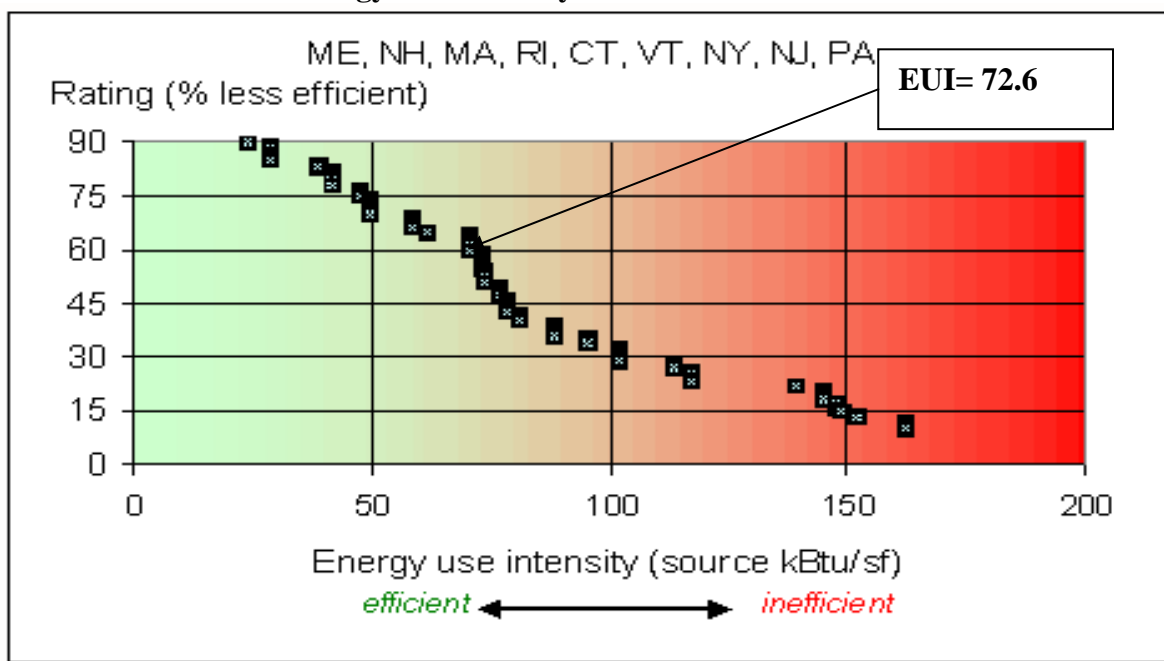
$$\text{Electric} = ((1,781,620 \text{ kWh}) * (1000 \text{ W/kWh}) * (3.414 \text{ Btu/h} / 1 \text{ W})) / (1000 \text{ Btu} / 1 \text{ kBtu}) = 6,082,450 \text{ kBtu}$$

$$\text{Gas} = ((77,120 \text{ therms}) * (100,000 \text{ Btu/h} / 1 \text{ therm})) / (1000 \text{ Btu/h} / 1 \text{ kBtu/h}) = 7,712,000 \text{ kBtu/h}$$

$$\text{Building EUI} = \frac{(6,082,450 \text{ kBtu/h} + 7,712,000 \text{ kBtu/h})}{190,000 \text{ SF}} = \frac{13,794,450 \text{ kBtu/h}}{190,000 \text{ SF}} = 72.6 \text{ kBtu/SF}$$

Crossroads South Middle School EUI = 72.6 kBtu/SF

**Figure 3**  
**Energy Use Intensity Distributions – Schools**



C. EPA Energy Benchmarking System

The United States Environmental Protection Agency (EPA) in an effort to promote energy management has created a system for benchmarking energy use amongst various end users. The benchmarking tool utilized for this analysis is entitled Portfolio Manager. The Portfolio Manager tool allows you to track and assess energy consumption via the template forms located on the ENERGY STAR website ([www.energystar.gov](http://www.energystar.gov)). The importance of benchmarking for local government municipalities is becoming more important as utility costs continue to increase and more emphasis is being placed throughout multiple arenas on carbon reduction, greenhouse gas emissions and other environmental impacts.

Based on information gathered from the ENERGY STAR website, Government agencies spend more than \$10 billion a year on energy to provide public services and meet constituent needs. Furthermore, energy use in commercial buildings and industrial facilities is responsible for more than 50 percent of U.S. carbon dioxide emissions. Therefore, it is vital that local government municipalities assess their energy usage, benchmark this usage utilizing Portfolio Manager, set priorities and goals to lessen their energy usage and move forward with these priorities and goals. Saving energy will in-turn save the environment.

In accordance with the Local Government Energy Audit Program, CEG has created an Energy Star account for the school district in order to allow access to monitor their yearly energy usage as it compares to facilities of similar type. The login page for the account can be accessed at the following web address; the username and password are also listed below:

<https://www.energystar.gov/istar/pmpam/index.cfm?fuseaction=login.login>

User Name:	southbrunswick
Password:	lgeaceg09002

Utilizing the utility bills and other information gathered during the energy audit process, CEG entered the respective data into Portfolio Manager and the following is a summary of the results:

**Table 5  
ENERGY STAR Performance Rating**

FACILITY DESCRIPTION	ENERGY PERFORMANCE RATING	NATIONAL AVERAGE
Crossroads South Middle	49	50

Specific building types are detailed on the ENERGY STAR website. Non-typical buildings are covered by an “Other” category. The “Other” category is used if your building type or a section of the building is not represented by one of the specific categories. An Energy Performance Rating cannot be calculated if more than 10% of a building is classified as “Other,” or if the building is an office with less than 5,000 square feet of floor space.

The Energy Use Intensity (EUI) is also an important tool that can be used to track the energy efficiency of the building. Baselines for improvement can be set that the municipality can strive to meet. CEG recommends that the South Brunswick School District keep their Portfolio Manager account up to date to monitor the performance of the building.

The EUI calculated in the previous section and in the Energy Star Portfolio Manager is a good indicator of the energy performance of the Crossroads South Middle School, in addition to the Energy Star Performance Rating.

The EUI distribution, Figure 3, is specific for Schools. The Crossroads South Middle School has an EUI of 72.6 rating for this type of facility. The lower the EUI the less energy the facility uses per square foot. A low EUI indicates a more efficient building. There maybe some opportunity for improvement making the facility more energy efficient and saving more on the utility costs.

**Refer to Appendix G for detailed energy benchmarking report entitled “STATEMENT OF ENERGY PERFORMANCE.”**

## V. FACILITY DESCRIPTION

The Crossroads South Middle School was originally constructed and used for the purposes of a high school. The original portion of the building was constructed in 1960 and consisted of a 2 story classroom wing, auditorium, labs, café, locker rooms and gymnasium. It is constructed of slab on grade with masonry block walls. Since the original building construction there have been many additions and alterations enlarging the building to a total of 192,000 square feet from 68,000 square feet in 1960. In 1974 an art room, media center, new cafeteria and kitchen were added to the school. The art room was added at the north end of the school with the cafeteria residing at the rear (east side) of the building. The media center was constructed in an existing courtyard. In 1981 a 60,000 square foot addition was added at the north end of the building consisting of a gymnasium, wood and metal shops, locker rooms and a greenhouse. The addition is separate from the main building and is connected to the main portion of the building via hallway. Along with the addition in 1981 there was a renovation project within the existing building which mainly consisted of ceiling and lighting replacements. In 1992 there was another interior renovation which shifted some interior walls and replaced some lighting and ceilings. In 2007 there was a mechanical project performed at the north end gym and locker rooms to add air conditioning. The school currently enrolls 1200 middle school students and has approximately 100 faculty.

### Heating Systems

The primary heating system for the facility is hot water provided by a total of 3 boilers. The first two boilers were installed in the original building in 1960 and have since been replaced with (2) Weil McLain fire tube boilers in 1981. The total output capacity of these two boilers is approximately 14,000 MBH and the boilers are roughly 75% efficient. We feel these boilers are near the end of their useful and should be replaced within the next 5 years with more efficient units. The main boilers serve a combination of terminal devices including radiant panels, finned tube radiation, unit ventilations and indoor air handling units. The boiler pumps are constant speed and operate continuously during boiler operation. We suggest replacing the boiler pump motors with high efficiency units and installing variable frequency drives to save energy.

The third boiler was added in the 1981 in the gymnasium addition and serves only the addition. The unit is a Cleaver Brooks fire tube boiler with an output of approximately 5000 MBH and is roughly 75% efficient. We feel this boiler is near the end of its useful life and should be replaced within the next 5 years with a more efficient unit. The boiler serves a combination of terminal devices including radiant panels, finned tube radiation, unit ventilations and indoor air handling units. The boiler pumps are constant speed and operate continuously during boiler operation. We suggest replacing the boiler pump motors with high efficiency units and installing variable frequency drives to save energy.

Aside from the hot water heating systems there are other heating systems serving the building in isolated areas. The library has three rooftop units with natural gas fired furnaces providing heat for the library. Also, the north gym has two large air handlers with gas furnaces for heating. The

cafeteria and kitchen units at the rear of the building are served by modular rooftop air handlers with electric heating coils. The units are old and appear near the end of their useful life. Also, the electric heating coils are very expensive to operate and we recommend replacing these units within the next two years. There are also a few electric heating coils located throughout the building for “spot” heating allowing for concise control.

### **Domestic Hot Water**

The majority of the building, aside from the north gymnasium addition, is served by a hot water generator in the boiler room. The unit is fed hot water from the existing Weil McLain boilers and has a 1300 gallon storage tank with a 1400 gallon/hour recovery rate. The unit appears to be in good condition. The gymnasium addition has two Bradford White domestic water heaters totalling 175 gallons of storage with 325 MBH gas input. Both units are 83% efficient and appear to be in good condition. One of the units was under repair at the time of our survey.

### **Cooling Systems**

Cooling for the building is provided by a number of independent air conditioning systems. The original building was built with heating and ventilating equipment only and has since been retrofitted to have air conditioning. The classrooms at the 2 story south wing have unit ventilators with split rooftop condensing units and hot water coils for heating. Most of these units have been installed within the last 5 years and appear to be in good condition. The front offices at the west side entry of the building have a mix of rooftop heat pumps and split system fan coil units. The heat pumps appear to be in poor condition and should be replaced in the next 2 years. The split system fan coil units were installed within the last 2 years and are in good condition. The library has packaged rooftop units with natural gas heating. The units appear to be in good condition. The classrooms in and around the old gym at the center core of the school have split system air handling units with outdoor rooftop condensing units which appear to be in good condition. However we do recommend upgrading all of the existing air handling unit fans with high efficiency motors.

### **Lighting System**

Typical lighting throughout the building uses fluorescent tube fixtures with energy efficient T-8 lamps and electronic ballasts. A limited number of fixtures use compact fluorescent lamps.

The exterior lighting uses mainly high intensity discharge wall mounted fixtures and pole mounted fixtures.

The existing lighting control system utilizes energy efficient occupancy sensors and “A/B” switching in most areas. Standard switching is used in remaining locations. “A/B” switching allows the occupant the ability to control approximately 50% of the lighting in an area with one switch and the remaining 50% with a separate switch if increased light levels are needed.

School “As Built” drawings indicate that the facility has recently undergone a lighting and lighting controls upgrade and this was confirmed during the field survey. The light fixtures and

lighting controls currently installed are estimated to be approximately three years old, energy efficient and are not recommended for replacement at this time.

**Refer to Appendix E for a detailed Investment Grade Lighting Audit.**

## **VI. MAJOR EQUIPMENT LIST**

Following the completion of the field survey a detailed equipment list was created. The equipment within this list is considered major energy consuming equipment whose replacement could yield substantial savings. In addition, 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 if a manufacturers 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.

Equipment denoted by an asterisk indicates an estimate of the equipment ratings due to equipment inaccessibility, worn nameplates, lack of nameplates, etc.

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

## VII. ENERGY CONSERVATION MEASURES (ECM)

### ECM # 1: Variable Speed Pumping

The existing hot water pumps are constant speed. The system has a bypass valve which allows for recirculation when terminal equipments' control valves close down. We suggest installing new pumps with variable frequency drives (VFD). The existing 2-way control valves at all of the terminal equipment can remain. The new pumps would be controlled by remote pressure sensors to keep the system charged properly. The VFD's modulate the pump's speed in order to maintain the necessary system pressure as prescribed at the BMS.

The calculations for this ECM were performed using Trane Trace 700™ building simulation software and the estimated payback is approximately 7.2 years. Outputs from the simulation software are located in Appendix G. A summary of the calculations is shown below.

<b>ECM #1 - ENERGY SAVINGS SUMMARY</b>	
<b>Installation Cost (\$):</b>	\$147,000
<b>NJ Smart Start Equipment Incentive (\$):</b>	\$7,064
<b>Net Installation Cost (\$):</b>	\$139,936
<b>Maintenance Savings (\$/Yr):</b>	\$4,800
<b>Energy Savings (\$/Yr):</b>	\$14,558
<b>Total Yearly Savings (\$/Yr):</b>	\$19,358
<b>Estimated ECM Lifetime (Yr):</b>	15
<b>Simple Payback</b>	7.2
<b>Simple Lifetime ROI</b>	56.0%
<b>Simple Lifetime Maintenance Savings</b>	\$72,000
<b>Simple Lifetime Savings</b>	\$218,370
<b>Internal Rate of Return (IRR)</b>	11%
<b>Net Present Value (NPV)</b>	\$91,158.55

## ECM # 2: Control Modifications

The existing HVAC system is controlled by a central Metasys system. We've reviewed the operating schedules of the equipment and recommend modifying some schedules to streamline the operation and save energy. The majority of the central air handling equipment provides 100% ventilation at all times when cooling and heating is required. We recommend creating occupied and unoccupied scheduling to reduce the outside air requirement during unoccupied times. Nightly maintenance does not require full ventilation along with down times such as holidays and weekends. We anticipate a savings of approximately 5% on the overall annual utility bills by modifying the controls.

The estimated payback for this ECM is approximately 1.4 years. A summary of the calculations is shown below.

<b>ECM #2 - ENERGY SAVINGS SUMMARY</b>	
<b>Installation Cost (\$):</b>	\$28,000
<b>NJ Smart Start Equipment Incentive (\$):</b>	\$0
<b>Net Installation Cost (\$):</b>	\$28,000
<b>Maintenance Savings (\$/Yr):</b>	\$4,800
<b>Energy Savings (\$/Yr):</b>	\$20,000
<b>Total Yearly Savings (\$/Yr):</b>	\$24,800
<b>Estimated ECM Lifetime (Yr):</b>	15
<b>Simple Payback</b>	1.1
<b>Simple Lifetime ROI</b>	971.4%
<b>Simple Lifetime Maintenance Savings</b>	\$72,000
<b>Simple Lifetime Savings</b>	\$300,000
<b>Internal Rate of Return (IRR)</b>	89%
<b>Net Present Value (NPV)</b>	\$268,060.79

### ECM # 3: Cafeteria Rooftop Unit Replacement

The existing cafeteria HVAC system consists of two rooftop air handlers with split condensing units. Each air handler is a Trane modular unit with a 25 ton cooling coil and an 80 kW electric heating coil. Both units were installed about 20 years ago and are near the end of their useful life. In addition the electric heating coils are very costly to run. We recommend replacing each unit with a new 25 ton packaged rooftop unit with natural gas heating. The new units would be packaged without the need for an external condensing unit.

The calculations for this ECM were performed using Trane Trace 700™ building simulation software and the estimated payback is approximately 4.9 years. Outputs from the simulation software are located in Appendix G. A summary of the calculations is shown below.

<b>ECM #3 - ENERGY SAVINGS SUMMARY</b>	
<b>Installation Cost (\$):</b>	\$165,950
<b>NJ Smart Start Equipment Incentive (\$):</b>	\$3,950
<b>Net Installation Cost (\$):</b>	\$162,000
<b>Maintenance Savings (\$/Yr):</b>	\$4,800
<b>Energy Savings (\$/Yr):</b>	\$26,462
<b>Total Yearly Savings (\$/Yr):</b>	\$31,262
<b>Estimated ECM Lifetime (Yr):</b>	15
<b>Simple Payback</b>	5.2
<b>Simple Lifetime ROI</b>	145.0%
<b>Simple Lifetime Maintenance Savings</b>	\$72,000
<b>Simple Lifetime Savings</b>	\$396,930
<b>Internal Rate of Return (IRR)</b>	18%
<b>Net Present Value (NPV)</b>	\$211,203.73

## ECM # 4: Stage Unit Replacement

The existing auditorium stage HVAC system consists of a split system with an indoor modular air handler and outdoor condensing units. The indoor unit has a 15 ton cooling coil with a 60 KW electric heating coil. The outdoor portion consists of two 7-1/2 ton condensing units joined by a manifold together at the indoor unit. The system was installed about 20 years ago and is near the end of its useful life. In addition the electric heating coil is very costly to run. We recommend replacing the system with a new 15 ton packaged rooftop unit with natural gas heating. The new unit would be packaged without the need for an external condensing unit.

The calculations for this ECM were performed using Trane Trace 700™ building simulation software and the estimated payback is approximately 14.2 years. Outputs from the simulation software are located in Appendix G. A summary of the calculations is shown below.

<b>ECM #4 - ENERGY SAVINGS SUMMARY</b>	
<b>Installation Cost (\$):</b>	\$65,425
<b>NJ Smart Start Equipment Incentive (\$):</b>	\$2,370
<b>Net Installation Cost (\$):</b>	\$63,055
<b>Maintenance Savings (\$/Yr):</b>	\$2,400
<b>Energy Savings (\$/Yr):</b>	\$6,466
<b>Total Yearly Savings (\$/Yr):</b>	\$8,866
<b>Estimated ECM Lifetime (Yr):</b>	15
<b>Simple Payback</b>	7.1
<b>Simple Lifetime ROI</b>	53.8%
<b>Simple Lifetime Maintenance Savings</b>	\$36,000
<b>Simple Lifetime Savings</b>	\$96,990
<b>Internal Rate of Return (IRR)</b>	11%
<b>Net Present Value (NPV)</b>	\$42,786.73

## ECM #5: Cleaver Brooks Boiler Replacement

### Description:

The existing boiler heating the north gymnasium wing is approximately 75% efficient and has a remaining useful life of about 2 more years. We are suggesting replacing the boiler with a new 92% efficient (97% part load eff.) boilers with fully modulating capabilities. The existing boilers do not modulate. We recommend installing 2 new Lochinvar Intellifin IBN 1700 boilers with 1700 MBH input. The total boiler output would be about 3400 MBH, slightly below the existing capacity. Our model of the existing facility indicates a need for approximately 1800 MBH of heating capacity which is less than half of the existing boiler capacity. We recommend installing redundant boilers as shown.

The calculations for this ECM were performed using Trane Trace 700™ building simulation software and the estimated payback is approximately 6.5 years. Outputs from the simulation software are located in Appendix G. A summary of the calculations is shown below.

<b>ECM #5 - ENERGY SAVINGS SUMMARY</b>	
<b>Installation Cost (\$):</b>	\$141,500
<b>NJ Smart Start Equipment Incentive (\$):</b>	\$5,250
<b>Net Installation Cost (\$):</b>	\$136,250
<b>Maintenance Savings (\$/Yr):</b>	\$4,800
<b>Energy Savings (\$/Yr):</b>	\$16,298
<b>Total Yearly Savings (\$/Yr):</b>	\$21,098
<b>Estimated ECM Lifetime (Yr):</b>	16
<b>Simple Payback</b>	6.5
<b>Simple Lifetime ROI</b>	91.4%
<b>Simple Lifetime Maintenance Savings</b>	\$76,800
<b>Simple Lifetime Savings</b>	\$260,768
<b>Internal Rate of Return (IRR)</b>	13%
<b>Net Present Value (NPV)</b>	\$128,764.13

## ECM #6: Weil McLain Boiler Replacement

### Description:

The existing boilers heating the main building, excluding the north gymnasium wing, are approximately 75% efficient and have a remaining useful life of about 2 more years. We are suggesting replacing the boilers with 92% efficient (97% part load eff.) boilers with fully modulating capabilities. The existing boilers do not modulate. We recommend installing 3 new Lochinvar Intellifin IBN 1700 boilers with 1700 MBH input. The total boiler output would be about 4700 MBH, slightly below the existing capacity. Our model of the existing facility indicates a need for approximately 2200 MBH including the domestic hot water generator load.

The calculations for this ECM were performed using Trane Trace 700™ building simulation software and the estimated payback is approximately 3.8 years. Outputs from the simulation software are located in Appendix G. A summary of the calculations is shown below.

<b>ECM #6 - ENERGY SAVINGS SUMMARY</b>	
<b>Installation Cost (\$):</b>	\$165,500
<b>NJ Smart Start Equipment Incentive (\$):</b>	\$4,000
<b>Net Installation Cost (\$):</b>	\$161,500
<b>Maintenance Savings (\$/Yr):</b>	\$4,800
<b>Energy Savings (\$/Yr):</b>	\$41,728
<b>Total Yearly Savings (\$/Yr):</b>	\$46,528
<b>Estimated ECM Lifetime (Yr):</b>	17
<b>Simple Payback</b>	3.5
<b>Simple Lifetime ROI</b>	339.2%
<b>Simple Lifetime Maintenance Savings</b>	81600
<b>Simple Lifetime Savings</b>	\$709,376
<b>Internal Rate of Return (IRR)</b>	28%
<b>Net Present Value (NPV)</b>	\$451,093.16

## ECM #7: Premium Efficiency Fan Motors

### Description:

The existing HVAC systems serving the north wing addition classrooms and the center core classrooms have standard efficiency motors in their air handling units. We suggest replacing the motors with premium efficiency motors to increase the fan efficiency which in turn saves energy.

The calculations for this ECM were performed using Trane Trace 700™ building simulation software and the estimated payback is approximately 26.2 years. Outputs from the simulation software are located in Appendix G. A summary of the calculations is shown below.

<b>ECM #7 - ENERGY SAVINGS SUMMARY</b>	
<b>Installation Cost (\$):</b>	\$13,700
<b>NJ Smart Start Equipment Incentive (\$):</b>	\$762
<b>Net Installation Cost (\$):</b>	\$12,938
<b>Maintenance Savings (\$/Yr):</b>	\$0
<b>Energy Savings (\$/Yr):</b>	\$500
<b>Total Yearly Savings (\$/Yr):</b>	\$500
<b>Estimated ECM Lifetime (Yr):</b>	18
<b>Simple Payback</b>	25.9
<b>Simple Lifetime ROI</b>	-30.4%
<b>Simple Lifetime Maintenance Savings</b>	\$0
<b>Simple Lifetime Savings</b>	\$9,000
<b>Internal Rate of Return (IRR)</b>	-4%
<b>Net Present Value (NPV)</b>	<b>(\$6,061.24)</b>

## VIII. RENEWABLE/DISTRIBUTED ENERGY MEASURES (REM #1)

Globally, renewable energy has become a priority affecting international and domestic energy policy. The State of New Jersey has taken a proactive approach, and has recently adopted in its Energy Master Plan a goal of 30% renewable energy by 2020. To help reach this goal New Jersey created the Office of Clean Energy under the direction of the Board of Public Utilities and instituted a Renewable Energy Incentive Program to provide additional funding to private and public entities for installing qualified renewable technologies. A renewable energy source can greatly reduce a building's operating expenses while producing clean environmentally friendly energy. CEG has assessed the feasibility of installing renewable energy technologies for the Crossroads South Middle School, to evaluate if there is any potential for solar or wind energy generation.

Solar energy produces clean energy and reduces a building's carbon footprint. This is accomplished via photovoltaic panels which will be mounted on all south and southwestern facades of the building. Flat roof, as well as sloped areas can be utilized; flat areas will have the panels turned to an optimum solar absorbing angle. (A structural survey of the roof would be necessary before the installation of PV panels is considered). Parking lots can also be utilized for the installation of a solar array. A truss system can be installed that is high enough to park a vehicle under the array, this way no parking lot area is lost. The state of NJ has instituted a program in which one Solar Renewable Energy Certificate (SREC) is given to the Owner for every 1000 kWh of generation. SREC's can be sold anytime on the market at their current market value. The value of the credit varies upon the current need of the power companies. The average value per credit is around \$350, this value was used in our financial calculations. This equates to \$0.35 per kWh generated.

CEG has reviewed the existing roof area of the building being audited for the purposes of determining a potential for a roof mounted photovoltaic system. A roof area of 28,278 S.F. can be utilized for a PV system on the roof. A depiction of the area utilized is shown in Appendix F following the financial calculations. Using this square footage it was determined that a system size of 442 kilowatts could be installed to help reduce the maximum peak monthly demand. The required square footage for a system of this size is approximately 28,000 S.F. and has an estimated kilowatt hour production of 689,855 KWh annually, reducing the overall electric consumption by approximately 38.7%. A detailed financial analysis can be found in Appendix F. This analysis illustrates the payback of the system over a 25 year period. The eventual degradation of the solar panels and the price of accumulated SREC's are factored into the payback.

CEG has reviewed financing options for the owner. Two options were studied and they are as follows: Self-financed and direct purchase without finance. Self-finance was calculated with 95% of the total project cost financed at a 7% interest rate over 25 years. Direct purchase involves the local government paying for 100% of the total project cost upfront. Both of these calculations include a utility inflation rate as well as the degradation of the solar panels over time. Based on our calculations the following are the payback periods for the respective method of payment:

<b>PAYMENT TYPE</b>	<b>SIMPLE PAYBACK</b>	<b>INTERNAL RATE OF RETURN</b>
Self-Finance	11.6 Years	9.2 %
Direct Purchase	11.6 Years	7.6 %

The above information is concluded as REM #1 showing installation costs, energy savings and other pertinent summarized information in Section I of this report.

Wind energy production is another option available through the Renewable Energy Incentive Program. Small wind turbines can be utilized to produce clean energy on a per building basis. Cash incentives are available per kWh of electric usage. CEG has reviewed the applicability of wind energy for South Brunswick and has determined it is not a viable option. Low average wind speeds for the area are not adequate for wind turbine generation. Typical wind turbines start producing energy at 8 mph wind speeds. South Brunswick averages 4 mph wind speeds making this application impractical.

## **IX. ENERGY PURCHASING AND PROCUREMENT STRATEGY**

### **Load Profile:**

Load Profile analysis was performed to determine the seasonal energy usage of the facility. Irregularities in the load profile will indicate potential problems within the facility. Consequently based on the profile a recommendation will be made to remedy the irregularity in energy usage. For this report, the facility's energy consumption data was gathered in table format and plotted in graph form to create the load profile. The Electric and Natural Gas Usage Profiles included within this report to reference the respective electricity and natural gas usage load profile for June 2007 through May 2008.

### Electricity:

The facility was originally constructed and used for the purposes of a high school. The original portion of the building was constructed in 1960 and consisted of a 2 story classroom wing, auditorium, labs, café, locker rooms and gymnasium. There have been many additions and alterations to the original building.

The Electric Usage Profile demonstrates a fairly flat (consistent) load profile. There is an exception in January when a peak is observed. Typically this peak would be present in the summer, but the summer (June – August) actually demonstrates usage eroding (decreasing). Consumption actually escalates beginning September and continuing through January. Summer Cooling is provided by many independent air conditioning systems. The classrooms at the 2 story south wing have unit ventilators with split rooftop condensing units. The front offices at the west side entry of the building have a mix of rooftop heat pumps and split system fan coil units. The classrooms in and around the old gym at the center core of the school have split system air handling units with outdoor rooftop condensing units. Adding to the winter electric load profile are electric heating coils disbursed throughout the building. This facility utilizes the Delivery service (LPLS and GLP), and its Commodity service (BGS) from Public Service Electric and Gas Company (PSE&G). A base-load shaping is important because a flat consumption profile will yield more competitive pricing when shopping for a Third Party Supplier.

### Natural Gas:

The Natural Gas Usage Profile demonstrates a typical heating load (November –March), and complimentary cooling load (April –October). Consequently there is a clear separation between summer and winter loads consistent with Wholesale Energy Pricing. Heating loads carry a much higher average cost because of the higher demand for natural gas during the winter. In this facility the primary heating is provided by hot water via (3) three boilers. The library also has (3) three, roof top units with natural gas fired furnaces. The kitchen and the cafeteria are heated by modular roof-top air handlers with heating coils. Domestic hot water is provided via a hot water generator in the boiler room. The unit is fed by the existing Weil McLain boilers. This facility utilizes the Delivery service (LVG) from Public Service Electric and Gas (PSE&G) while it receives its Commodity service from Woodruff Energy, the Third Party Supplier.

**Tariff Analysis:**Electricity:

South Brunswick receives electrical service through Public Service Electric and Gas Company (PSE&G) on a LPLS (Large Power Lighting Service) and GLP (General Lighting and Power Service) rate schedule.

The LPLS utility tariff is for delivery service for general purposes at secondary distribution voltages where the customers measured peak demand exceeds 150 kW in any given month and also at primary distribution voltages. Customers may either purchase electric supply from a Third Party Supplier (TPS) or from PSE&G's Basic Generation Service default service as detailed in the rate schedule. The rate schedule has a Delivery Charge; Distribution kW and kWh Charge, Societal Benefits Charge, Non-utility Generation Charge, Securitization Charge, System Control Charge, Customer Account Services Charge, Standby Fee, Base Rate Distribution Adjustment Charge, Solar Pilot Recovery Charge and RGGI Charge. The customer can elect to have the Commodity Charge serviced through the utility or by a Third Party Supplier (TPS).

The GLP utility tariff is for Delivery service for general purposes at secondary distribution voltages. Customers may either purchase electric supply from a Third Party Supplier (TPS) or from Public Service's Basic Generation Service default service as detailed in this rate schedule. This facility is currently receiving Generation service from PSE&G's Basic Generation Service.

The PSE&G Delivery service has the following charges: Service Charge, Distribution Charges, Societal Benefits Charges, Non-Utility Generation Charges, Securitization Transition Charges, System Control Charges, Customer Account Services Charges, Commercial and Industrial Energy Pricing Standby Fee (CIEP), Base Rate Distribution Kilowatt Adjustment Charge, Solar Pilot Recovery Charge and Capital Adjustment Charge.

A flat load profile will allow for a more competitive energy price when shopping for an "alternate energy source".

Natural Gas:

South Brunswick receives natural gas service through Public Service Electric and Gas Company LVG (Large Volume Gas) rate class, when not receiving commodity by a Third Party Supplier. This utility tariff is for firm delivery service for general purposes. This rate schedule has a Delivery Charge, Balancing Charge, Societal Benefits Charge, Realignment Adjustment Charge, Margin Adjustment Charge, RGGI Charge and Customer Account Service Charge. The customer can elect to have the Commodity Charge serviced through the utility or by a Third Party Supplier (TPS). It is pertinent to note, should the TPS not deliver, the customer may receive service from PSE&G under Emergency Sales Service. Emergency Sales Service carries an extremely high penalty cost of service.

Imbalances occur when Third Party Suppliers are used to supply natural gas, full-delivery is not made, and when a new supplier is contracted or the customer returns to the utility. It is important when utilizing a Third Party Supplier, that an experienced regional supplier is used. Otherwise, imbalances can occur, jeopardizing economics and scheduling.

From review of the information provided by the School District, South Brunswick is utilizing the services of a Third Party Supplier, Woodruff Energy for natural gas service. The contract is administered through the Middlesex Regional Educational Services Commission (MRESC) for the term, August 1, 2008 through July 31, 2010. The agreement is between the MRESC and South Brunswick BOE and it does not define the full and final price. Based on the limited data available, it appears that South Brunswick is paying over 20% above market price.

Additionally, the MRESC charges \$.0325 per decatherm for administering this RFP. The South Brunswick BOE could realize additional savings by evaluating a new natural gas contract. It should be noted that there was not a Woodruff Energy Contract available for review, nor a complete delivered natural gas price.

### **Recommendations:**

CEG recommends a global approach that will be consistent with all facilities. CEG's primary observation is seen in the electricity costs. South Brunswick's "weighted average price-to-compare" per kWh (kilowatt hour) for all buildings is \$.1479/kWh (kWh is the common unit of electric measure).

The price to compare is defined as the price that would be compared to the equivalent utility price extracting the utility transmission and distribution costs (wires charges). This would be a market based price that would be supplied by a Third Party Supplier (TPS) or an alternative supplier.

The average "price-to-compare" per decatherm for natural gas is \$12.50/dth (Dth is the common unit of measure). Energy commodities are among the most volatile of all commodities, however at this point and time, energy is extremely competitive. South Brunswick could see significant savings if it were to take advantage of these current market prices quickly, before energy increases. Based on last year's historical consumption (June 2007 through May 2008) and current electric rates, South Brunswick would see an improvement of over \$150,000 or over 20% annually. (Note: Savings were calculated using South Brunswick High School's Average Annual Consumption of 5,749,304 kWh's and a variance of approximately \$.03/kWh and utilizing a fixed one-year commodity contract). South Brunswick should aggregate its entire electric load to gain the most optimal energy costs. CEG recommends advisement for alternative sourcing and supply of energy on a "managed approach".

CEG's secondary recommendation coincides with South Brunswick's natural gas costs and the contract with MRESC and Woodruff Energy. CEG recognized a segment of the natural gas cost is not competitive with current market prices. Based on the current market, South Brunswick is paying approximately \$1.717 per unit above market in the PSEG territory and about \$.58 per unit above market in the Elizabethtown Gas and New Jersey Natural Gas territories. CEG recommends further advisement on these prices. South Brunswick should also consider procuring energy (natural gas) on its own. By procuring energy through the MRESC it is paying a premium of \$.0325 per unit. CEG recommends alternative sourcing strategies.

CEG has observed that there is a cost differential from Phase I. For the facilities in Phase II CEG observes improvement of up to \$100,000 in natural gas costs. Since energy prices have dropped since last we analyzed the energy costs, South Brunswick could now see an improvement of up to 60% in the variance to market based pricing.

CEG recommends that South Brunswick schedule a meeting with their current utility providers to review their utility charges and current tariff structures for electricity and natural gas. This meeting would provide insight regarding alternative procurement options that might be available to South Brunswick. Through its meeting with the Local Distribution Company (LDC), South Brunswick will learn more about the competitive supply process. South Brunswick can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at [www.nj.gov/bpu](http://www.nj.gov/bpu). South Brunswick should also consider using a billing-auditing service to further analyze the utility invoices, manage the data and use the data to manage ongoing demand-side management projects. Furthermore, CEG recommends South Brunswick pay attention to credit mechanisms, imbalances, balancing charges and commodity charges when meeting with their utility representative. In addition, South Brunswick should also ask the utility representative about alternative billing options. Some utilities allow for consolidated billing options when utilizing the service of a Third Party Supplier.

Finally, if South Brunswick frequently changes its supplier for energy (natural gas), it needs to closely monitor balancing, particularly when the contract is close to termination.

## X. INSTALLATION FUNDING OPTIONS

CEG has reviewed various funding options for the Owner to utilize in subsidizing the costs for installing the energy conservation measures noted within this report. Below are a few alternative funding methods:

- i. *Energy Savings Improvement Program (ESIP)* – Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. The “Energy Savings Improvement Program (ESIP)” law provides a flexible approach that can allow all government agencies in New Jersey to improve and reduce energy usage with minimal expenditure of new financial resources.
- ii. *Municipal Bonds* – Municipal bonds are a bond issued by a city or other local government, or their agencies. Potential issuers of municipal bonds include cities, counties, redevelopment agencies, school districts, publicly owned airports and seaports, and any other governmental entity (or group of governments) below the state level. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.
- iii. *Power Purchase Agreement* – Public Law 2008, Chapter 3 authorizes contractor of up to fifteen (15) years for contracts commonly known as “power purchase agreements.” These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system. These renewable energy systems are typically solar panels, windmills or other systems that create renewable energy. In exchange for the third party’s work of installing, maintaining and owning the renewable energy system, the contracting unit (Owner) agrees to purchase the power generated by the renewable energy system from the third party at agreed upon energy rates.

All in all, incentives provide financial motivation and much needed support for the implementation of energy conservation measures. Along with the NJ Smart Start program, the Pay for Performance Program incentives, sponsored by NJ Clean Energy Program, are applicable for this facility. The existing average operating demand above 200 KW and high energy consumption qualifies for the Pay for Performance Program. The incentive based on a 15% electrical energy reduction for this facility would qualify for an additional \$38,940 in the Pay for Performance Program. If natural gas consumption could be reduced by 15% the resultant incentive would be approximately \$19,914. This would equate to a total incentive equal to approximately \$58,854. This option is one to consider for a whole-building approach to energy reduction. The Pay for Performance Program represents a significant commitment to energy

reduction of a facility. This option should be reviewed in more detail with a Pay for Performance Program partner.

CEG recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

## **XI. 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. Use cog-belts instead of v-belts on all belt-driven fans, etc. These can reduce electrical consumption of the motor by 2-5%.
- D. Reduce lighting in specified areas where the foot candle levels are above 70 in private offices and above 30 in corridor, lobbies, etc.
- E. Provide more frequent air filter changes to decrease overall fan horsepower requirements and maintain better IAQ.
- F. Recalibrate existing sensors serving the office spaces
- G. Install a Vending Miser system to turn off the vending machines in the lunch room when not in use.
- H. Clean all light fixtures to maximize light output.
- I. Confirm that outside air economizers on the rooftop units that serve the Office Areas are functioning properly to take advantage of free cooling.

# APPENDIX

**ECM COST & SAVINGS BREAKDOWN**

CONCORD ENGINEERING GROUP

Crossroads South Middle School

ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME (Yr)	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Saving * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^N \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^N \frac{C_n}{(1+DR)^n}$
		(\$)	(\$)	(\$)	(\$)	(\$/Yr)	(\$/Yr)	(\$/Yr)		(\$)	(\$)	(%)	(Yr)	(\$)	(\$)
ECM #1	VARIABLE SPEED PUMPS	\$73,500	\$73,500	\$7,064	\$139,936	\$14,558	\$4,800	\$19,358	15	\$218,370	\$72,000	56.0%	7.2	10.90%	\$91,158.55
ECM #2	CONTROL MODIFICATIONS	\$10,650	\$17,350	\$0	\$28,000	\$20,000	\$4,800	\$24,800	15	\$300,000	\$72,000	971.4%	1.1	88.56%	\$268,060.79
ECM #3	CAFETERIA ROOFTOP UNIT REPLACEMENT	\$55,200	\$110,750	\$3,950	\$162,000	\$26,462	\$4,800	\$31,262	15	\$396,930	\$72,000	145.0%	5.2	17.60%	\$211,203.73
ECM #4	STAGE ROOFTOP UNIT REPLACEMENT	\$18,425	\$47,000	\$2,370	\$63,055	\$6,466	\$2,400	\$8,866	15	\$96,990	\$36,000	53.8%	7.1	11.20%	\$42,786.73
ECM #5	CLEAVER BROOKS BOILER REPLACEMENT	\$53,000	\$88,500	\$5,250	\$136,250	\$16,298	\$4,800	\$21,098	16	\$260,768	\$76,800	91.4%	6.5	4278673.25%	\$0.00
ECM #6	WEIL MCLAIN BOILER REPLACEMENT	\$62,000	\$103,500	\$4,000	\$161,500	\$41,728	\$4,800	\$46,528	17	\$709,376	\$81,600	339.2%	3.5	0.00%	\$0.00
ECM #7	HIGH EFFICIENCY FAN MOTORS	\$5,500	\$8,200	\$762	\$12,938	\$500	\$0	\$500	18	\$9,000	\$0	-30.4%	25.9	0.00%	\$0.00
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	440 KW SOLAR PV	\$671,000	\$3,307,540	\$0	\$3,978,540	\$100,719	\$241,449	\$342,168	25	\$2,517,975	\$6,036,225	-36.7%	11.6	7.02%	\$1,979,681.92

- 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.

<b>CONSTRUCTION COST AND REBATES</b>					
<b><u>BASE CASE - EXISTING EQUIPMENT</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
Total Cost			\$0	\$0	<b>\$0</b>
<b>ECM # 1 - VARIABLE SPEED PUMPS</b>					
<b><u>ECM # 1 - VARIABLE SPEED PUMPS</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
Hot Water Pump (20 HP) w/ VFD	2	\$20,000	\$40,000	\$40,000	\$80,000
Hot Water Pump (10 HP) w/ VFD	2	\$9,000	\$18,000	\$18,000	\$36,000
Hot Water Pump (5 HP) w/ VFD	2	\$4,500	\$9,000	\$9,000	\$18,000
Piping	1		\$5,000	\$5,000	\$10,000
Controls	1		\$1,500	\$1,500	\$3,000
VFD & Premium Motor Rebate \$/HP					<u>\$7,064</u>
<b>Total after Rebate</b>					<b>\$139,936</b>
<b>ECM # 2 - CONTROL MODIFICATIONS</b>					
<b><u>ECM # 2 - CONTROL MODIFICATIONS</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
BAS Control Upgrades	1	\$5,500	\$5,500	\$9,625	\$15,125
Software	1	\$650	\$650	\$975	\$1,625
Wiring	1	\$4,500	\$4,500	\$6,750	\$11,250
Rebate					<u>\$0</u>
<b>Total after Rebate</b>					<b>\$28,000</b>
<b>ECM # 3 - CAFÉ ROOFTOP UNIT REPLACEMENT</b>					
<b><u>ECM # 3 - CAFÉ ROOFTOP UNIT REPLACEMENT</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
(2) 25 Ton Trane SFHF-2504 Gas Fired PKG	2	\$18,800	\$37,600	\$65,800	\$103,400
Curb Adapter	2	\$3,500	\$7,000	\$10,000	\$17,000
Ductwork Modifications	2	\$2,500	\$5,000	\$5,000	\$10,000
Controls & Wiring	2	\$2,800	\$5,600	\$9,800	\$15,400
Demo & Crane (2 - PCC / ACC)	1			\$20,150	\$20,150
Rebate (\$79/Ton)	50	\$79			<u>\$3,950</u>
<b>Total after Rebate</b>					<b>\$162,000</b>
<b>ECM # 4 - STAGE ROOFTOP UNIT REPLACEMENT</b>					
<b><u>ECM # 4 - STAGE ROOFTOP UNIT REPLACEMENT</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
(1) 15 Ton Trane Gas Fired PKG	<u>1</u>	\$11,325	\$11,325	\$19,819	\$31,144
Curb Adapter	1	\$1,500	\$1,500	\$2,250	\$3,750
Ductwork Modifications	1	\$3,600	\$3,600	\$6,300	\$9,900
Controls & Wiring	1	\$2,000	\$2,000	\$3,500	\$5,500
Demo & Crane (1 - PCC / ACC(2))				\$15,070	\$15,070
Rebate (\$79/Ton)	30	\$79			<u>\$2,370</u>
<b>Total after Rebate</b>					<b>\$62,994</b>
<b>ECM # 5 - CLEAVER BROOKS BOILER REPLACEMENT</b>					
<b><u>ECM # 5 - CLEAVER BROOKS BOILER REPLACEMENT</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
1500 MBH Input Lochinvar Boiler (97% Eff.)	2	\$25,500	\$51,000	\$76,500	\$127,500

Demo Old Boiler	1			\$10,000	\$10,000
Controls	2	\$1,000	\$2,000	\$2,000	\$4,000
Boiler Rebate (\$1.75/MBH)	2				\$5,250
<b>Total after Rebate</b>					<b>\$136,250</b>

<b><u>ECM # 6 - WEIL MCLAIN BOILER REPLACEMENT</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
2000 MBH Input Lochinvar Boiler (97% Eff.)	2	\$29,500	\$59,000	\$88,500	\$147,500
Demo Old Boilers	2			\$12,000	\$12,000
Controls	2	\$1,500	\$3,000	\$3,000	\$6,000
Boiler Rebate (\$1.00/MBH)	2				\$4,000
<b>Total after Rebate</b>					<b>\$161,500</b>

<b><u>ECM # 7 - HIGH EFFICIENCY FAN MOTORS</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
(1) 1 1/2 HP	1	\$246	\$246	\$369	\$615
(4) 5 HP	4	\$355	\$1,420	\$2,130	\$3,550
(2) 10 HP	2	\$601	\$1,202	\$1,803	\$3,005
(2) 15 HP	2	\$792	\$1,584	\$2,376	\$3,960
(1) 20 HP	1	\$986	\$986	\$1,479	\$2,465
Premium Eff Motor Rebate (\$/HP)		\$762			\$762
<b>Total after Rebate</b>					<b>\$12,833</b>

<b><u>REM # 1 - 440 KW SOLAR PV</u></b>	<u>Qty</u>	<u>Unit Cost \$</u>	<u>Material \$</u>	<u>Labor \$</u>	<u>Total \$</u>
	440	\$1,525	\$671,000	\$3,307,540	\$3,978,540
<b>Total</b>					<b>\$3,978,540</b>

### Annual Maintenance Cost

ECM	Base	Additional	Solar PV	Total
<b>BASE CASE - EXISTING EQUIPMENT</b>	\$48,000	\$0	\$0	\$48,000
<b>ECM # 1 - VARIABLE SPEED PUMPS</b>	\$48,000	-\$4,800	\$0	\$43,200
<b>ECM # 2 - CONTROL MODIFICATIONS</b>	\$48,000	-\$4,800	\$0	\$43,200
<b>ECM # 3 - CAFÉ ROOFTOP UNIT REPLACEMENT</b>	\$48,000	-\$4,800	\$0	\$43,200
<b>ECM # 4 - STAGE ROOFTOP UNIT REPLACEMENT</b>	\$48,000	-\$2,400	\$0	\$45,600
<b>ECM # 5 - CLEAVER BROOKS BOILER REPLACEMENT</b>	\$48,000	-\$4,800	\$0	\$43,200
<b>ECM # 6 - WEIL MCLAIN BOILER REPLACEMENT</b>	\$48,000	-\$4,800	\$0	\$43,200
<b>ECM # 7 - HIGH EFFICIENCY FAN MOTORS</b>	\$48,000	\$0	\$0	\$48,000
<b>REM # 1 - RENEWABLE ENERGY - SOLAR PANELS</b>	\$48,000	\$0	\$1,500	\$49,500

<b>EQUIPMENT REPLACEMENT COST FOR EACH ALTERNATE</b>			
<b>BASE CASE - EXISTING EQUIPMENT</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$67,000	20	2
Existing Trane PCC / ACC (1) System - Stage	\$21,500	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$65,000	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$115,000	25	2
Existing Constant Speed Pumps	\$72,000	20	2
Existing BAS Controls System	\$70,000	15	12
Existing Fan Motors	\$5,500	18	18
New Variable Speed Pumps	\$0	20	20
New Control Upgrades & Modifications	\$0	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$0	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$0	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$0	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$0	25	25
New Premium Efficient Fan Motors	\$0	18	18
New 440 KW PV Solar Panel System	\$0	25	25
<b>ECM # 1 - VARIABLE SPEED PUMPS</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$67,000	20	2
Existing Trane PCC / ACC (1) System - Stage	\$21,500	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$65,000	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$115,000	25	2
Existing Constant Speed Pumps	\$0	20	2
Existing BAS Controls System	\$70,000	15	12
Existing Fan Motors	\$5,500	18	18
New Variable Speed Pumps	\$73,500	20	20
New Control Upgrades & Modifications	\$0	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$0	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$0	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$0	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$0	25	25
New Premium Efficient Fan Motors	\$0	18	18
New 440 KW PV Solar Panel System	\$0	25	25
<b>ECM # 2 - CONTROL MODIFICATIONS</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$67,000	20	2
Existing Trane PCC / ACC (1) System - Stage	\$21,500	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$65,000	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$115,000	25	2
Existing Constant Speed Pumps	\$72,000	20	2
Existing BAS Controls System	\$0	15	12
Existing Fan Motors	\$5,500	18	18
New Variable Speed Pumps	\$0	20	20
New Control Upgrades & Modifications	\$28,000	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$0	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$0	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$0	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$0	25	25
New Premium Efficient Fan Motors	\$0	18	18
New 440 KW PV Solar Panel System	\$0	25	25

<b>ECM # 3 - CAFÉ ROOFTOP UNIT REPLACEMENT</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$0	20	2
Existing Trane PCC / ACC (1) System - Stage	\$21,500	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$65,000	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$115,000	25	2
Existing Constant Speed Pumps	\$72,000	20	2
Existing BAS Controls System	\$70,000	15	12
Existing Fan Motors	\$5,500	18	18
New Variable Speed Pumps	\$0	20	20
New Control Upgrades & Modifications	\$0	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$55,200	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$0	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$0	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$0	25	25
New Premium Efficient Fan Motors	\$0	18	18
New 440 KW PV Solar Panel System	\$0	25	25
<b>ECM # 4 - STAGE ROOFTOP UNIT REPLACEMENT</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$67,000	20	2
Existing Trane PCC / ACC (1) System - Stage	\$0	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$65,000	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$115,000	25	2
Existing Constant Speed Pumps	\$72,000	20	2
Existing BAS Controls System	\$70,000	15	12
Existing Fan Motors	\$5,500	18	18
New Variable Speed Pumps	\$0	20	20
New Control Upgrades & Modifications	\$0	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$0	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$18,500	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$0	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$0	25	25
New Premium Efficient Fan Motors	\$0	18	18
New 440 KW PV Solar Panel System	\$0	25	25
<b>ECM # 5 - CLEAVER BROOKS BOILER REPLACEMENT</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$67,000	20	2
Existing Trane PCC / ACC (1) System - Stage	\$21,500	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$0	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$115,000	25	2
Existing Constant Speed Pumps	\$72,000	20	2
Existing BAS Controls System	\$70,000	15	12
Existing Fan Motors	\$5,500	18	18
New Variable Speed Pumps	\$0	20	20
New Control Upgrades & Modifications	\$0	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$0	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$0	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$53,000	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$0	25	25
New Premium Efficient Fan Motors	\$0	18	18
New 440 KW PV Solar Panel System	\$0	25	25

<b>ECM # 6 - WEIL MCLAIN BOILER REPLACEMENT</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$67,000	20	2
Existing Trane PCC / ACC (1) System - Stage	\$21,500	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$65,000	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$0	25	2
Existing Constant Speed Pumps	\$72,000	20	2
Existing BAS Controls System	\$70,000	15	12
Existing Fan Motors	\$5,500	18	18
New Variable Speed Pumps	\$0	20	20
New Control Upgrades & Modifications	\$0	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$0	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$0	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$0	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$62,000	25	25
New Premium Efficient Fan Motors	\$0	18	18
New 440 KW PV Solar Panel System	\$0	25	25
<b>ECM # 7 - HIGH EFFICIENCY FAN MOTORS</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$67,000	20	2
Existing Trane PCC / ACC (1) System - Stage	\$21,500	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$65,000	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$115,000	25	2
Existing Constant Speed Pumps	\$72,000	20	2
Existing BAS Controls System	\$70,000	15	12
Existing Fan Motors	\$0	18	18
New Variable Speed Pumps	\$0	20	20
New Control Upgrades & Modifications	\$0	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$0	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$0	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$0	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$0	25	25
New Premium Efficient Fan Motors	\$5,500	18	18
New 440 KW PV Solar Panel System	\$0	25	25
<b>REM # 1 - 440 KW SOLAR PV</b>			
	\$	Life	Yr Incurred
Existing Trane PCC / ACC (2) Systems - Cafeteria	\$67,000	20	2
Existing Trane PCC / ACC (1) System - Stage	\$21,500	20	2
Existing Cleaver Brooks Boiler (1) 6277 MBH	\$65,000	25	2
Existing Weil McLain Boilers (2) 5520 MBH	\$115,000	25	2
Existing Constant Speed Pumps	\$72,000	20	2
Existing BAS Controls System	\$70,000	15	12
Existing Fan Motors	\$5,500	18	18
New Variable Speed Pumps	\$0	20	20
New Control Upgrades & Modifications	\$0	15	15
New 25 Ton Gas/Electric Pkg Rooftop Units (2) Cafeteria	\$0	15	15
New 15 Ton Gas/Electric Pkg Rooftop Units (1) Stage Area	\$0	15	15
New Lochinvar Boilers (2) 1500 MBh Input (Cleaver Brooks)	\$0	25	25
New Lochinvar Boilers (2) 2000 MBh Input (Weil McLain)	\$0	25	25
New Premium Efficient Fan Motors	\$0	18	18
New 440 KW PV Solar Panel System	\$0	25	25

# 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 January, 2009:

### Electric Chillers

Water-Cooled Chillers	\$12 - \$170 per ton
Air-Cooled Chillers	\$8 - \$52 per ton

### Gas Cooling

Gas Absorption Chillers	\$185 - \$400 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

### Desiccant Systems

	\$1.00 per cfm – gas or electric
--	----------------------------------

### Electric Unitary HVAC

Unitary AC and Split Systems	\$73 - \$93 per ton
Air-to-Air Heat Pumps	\$73 - \$92 per ton
Water-Source Heat Pumps	\$81 per ton
Packaged Terminal AC & HP	\$65 per ton
Central DX AC Systems	\$40- \$72 per ton
Dual Enthalpy Economizer Controls	\$250

### Ground Source Heat Pumps

Closed Loop & Open Loop	\$370 per ton
-------------------------	---------------

### 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

**Variable Frequency Drives**

Variable Air Volume	\$65 - \$155 per hp
Chilled-Water Pumps	\$60 per hp
Compressors	\$5,250 to \$12,500 per drive

**Natural Gas Water Heating**

Gas Water Heaters ≤ 50 gallons	\$50 per unit
Gas-Fired Water Heaters >50 gallons	\$1.00 - \$2.00 per MBH
Gas-Fired Booster Water Heaters	\$17 - \$35 per MBH

**Premium Motors**

Three-Phase Motors	\$45 - \$700 per motor
--------------------	------------------------

**Prescriptive Lighting**

T-5 and T-8 Lamps w/Electronic Ballast in Existing Facilities	\$10 - \$30 per fixture, (depending on quantity)
Hard-Wired Compact Fluorescent	\$25 - \$30 per fixture
Metal Halide w/Pulse Start	\$25 per fixture
LED Exit Signs	\$10 - \$20 per fixture
T-5 and T-8 High Bay Fixtures	\$16 - \$284 per fixture

**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

**Other Equipment Incentives**

Performance Lighting	\$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2004 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive

# Crossroads South Middle School

TAG	MAKE	MODEL	TYPE	CAPACITY	EFFICIENCY	SERVES	LOCATION	REMAINING USEFUL LIFE	NOTES
AC / H -1	INTER-CITY PRODUCTS CORP.	PAMA-024G1	ROOFTOP DX COOLING, ELECTRIC HEAT	2 TONS	N/A	STORAGE ROOM	2nd FL ROOF EAST END	4 YEARS	PACKAGED ROOFTOP UNIT
AC / H -2	INTER-CITY PRODUCTS CORP.	PAMA-024G2	ROOFTOP DX COOLING, ELECTRIC HEAT	2 TONS	N/A	TYPING ROOM	2nd FLOOR ROOF EAST END	4 YEARS	PACKAGED ROOFTOP UNIT
AC / H -3	INTER-CITY PRODUCTS CORP.	PAMA-024G3	ROOFTOP DX COOLING, ELECTRIC HEAT	2 TONS	N/A	HALLWAY 2nd FL.	2nd FLOOR ROOF EAST END	4 YEARS	PACKAGED ROOFTOP UNIT
AC / H-7	TRANE	TCC-3030A1000AA	AIR COOLED CONDENSING UNIT	2.5 TONS	13 SEER	CLASSROOMS 2 nd FL SOUTHEAST SIDE	2nd FLOOR ROOF EAST END	15 YEARS	SPLIT SYSTEM MATCHED TO DX CLASSROOM UNIT VENTILATORS
AC / H-22	TRANE	TCC-3030A1000AA	AIR COOLED CONDENSING UNIT	2.5 TONS	13 SEER	BIOLOGY CLASSROOM	2nd FL ROOF MIDDLE	15 YEARS	SPLIT SYSTEM MATCHED TO DX CLASSROOM UNIT VENTILATORS
AC / H-29	TRANE	THC-060E4ROA0FF	ROOFTOP DX COOLING, ELECTRIC HEAT	5 TONS	15 SEER	CHEMISTRY	2nd FL ROOF WEST END	15 YEARS	PACKAGED ROOFTOP UNIT
AC / H-1 To 21, 23 To 28, 30 To 35	TRANE	TCC-3036A1000AA	AIR COOLED CONDENSING UNIT	3 TONS	13 SEER	CLASSROOMS 1 st & 2nd FLOORS	ROOF	20 YEARS	SPLIT SYSTEM MATCHED TO CLASSROOM UNIT VENTILATORS
RTU-36	TRANE	YCD-180B4LOCA	ROOFTOP DX COOLING, GAS HEAT	15 TONS, 202.5 MBH OUTPUT, 250 MBH INPUT	11 EER, 80.7%	LIBRARY	UPPER ROOF OVER LIBRARY	0 YEARS	PACKAGED ROOFTOP UNIT SHOULD BE REPLACED
RTU-37	TRANE	YCD-120B4LOCA	ROOFTOP DX COOLING, GAS HEAT	10 TONS	11 EER	LIBRARY	UPPER ROOF OVER LIBRARY	0 YEARS	PACKAGED ROOFTOP UNIT SHOULD BE REPLACED
RTU-38	TRANE	YCD-090D4L0BA	ROOFTOP DX COOLING, GAS HEAT	7.5 TONS, 97 MBH OUTPUT	11 EER	LIBRARY	UPPER ROOF OVER LIBRARY	0 YEARS	PACKAGED ROOFTOP UNIT SHOULD BE REPLACED
AC / H-39 To 43	TRANE	TTA-3048A4000AA	AIR COOLED CONDENSING UNIT	4 TONS	13 SEER	CLASSROOM WEST SIDE	LOWER ROOF - FRONT	20 YEARS	SPLIT SYSTEM MATCHED TO CLASSROOM UNIT VENTILATORS
AC / H-44	ARCOAIRE	CH5560VLD2	AIR COOLED CONDENSING UNIT	5 TONS	N/A	PAINTING CLASSROOM	LOWER ROOF - FRONT		INTERNATIONAL COMFORT PRODUCTS
AC / H-45	RUUD	UAKA-036CAS	AIR COOLED CONDENSING UNIT	3 TONS	N/A	MIDDLE CLASSROOM	LOWER ROOF - FRONT	12 YEARS	SPLIT SYSTEM MATCHED TO DX FAN COIL UNITS
AC / H-46	TRANE	RAUC-404-D	AIR COOLED CONDENSING UNIT	40 TONS	9.5 EER	RESOURCE OFFICE AREA	MIDDLE ROOF BY LIBRARY	2 YEARS	SPLIT SYSTEM MATCHED TO DX FAN COIL UNITS
AC / H-47	RUUD	UAKA-037CAZ	AIR COOLED CONDENSING UNIT	3 TONS	N/A	CLASSROOMS - MIDDLE CORE OF BLDG.	LOWER ROOF - EAST SIDE	10 YEARS	SPLIT SYSTEM MATCHED TO DX FAN COIL UNITS
AC / H-48	ARCOAIRE	CH5560VLD4	AIR COOLED CONDENSING UNIT	5 TONS	N/A	CLASSROOMS - MIDDLE CORE OF BLDG.	LOWER ROOF - EAST SIDE	10 YEARS	INTERNATIONAL COMFORT PRODUCTS
AC / H-49	ARCOAIRE	CH5548VLD4	AIR COOLED CONDENSING UNIT	4 TONS	N/A	DISTRIBUTIVE E.D. CLASS	LOWER ROOF - BACK SIDE	10 YEARS	INTERNATIONAL COMFORT PRODUCTS
AC / H-50	TRANE	TSC-120A4R0A29D	ROOFTOP DX COOLING, ELECTRIC HEAT	10 TONS	11.3 EER	CLASSROOMS / OFFICES - MIDDLE CORE	LOWER ROOF - EAST SIDE	12 YEARS	PACKAGED ROOFTOP UNIT
AC / H-51	TRANE	RAUC-C254BB00	AIR COOLED CONDENSING UNIT	25 TONS	9.5 EER	OFFICES - MIDDLE CORE	LOWER ROOF - EAST SIDE	1 YEAR	1990 INSTALLATION
AC / H-52	INTERNAT. COMFORT PRODUCTS	CAC240LA	AIR COOLED CONDENSING UNIT	2 TONS	10 SEER	GRAPHICS CLASSROOM	LOWER ROOF - NORTH SIDE	5 YEARS	SPLIT SYSTEM MATCHED TO DX FAN COIL UNITS
AC / H-53	TRANE	RAUC-B754-A	AIR COOLED CONDENSING UNIT	7.5 TONS	10 EER	STAGE	LOWER ROOF - NORTH SIDE MIDDLE	1 YEAR	SPLIT SYSTEM MATCHED TO DX AIR HANDLING UNIT
AC / H-54	TRANE	RAUC-B754-A	AIR COOLED CONDENSING UNIT	7.5 TONS	10 EER	STAGE	LOWER ROOF - NORTH SIDE MIDDLE	1 YEAR	SPLIT SYSTEM MATCHED TO DX AIR HANDLING UNIT
AC / H-55	TRANE	RAUC-B754-A	AIR COOLED CONDENSING UNIT	7.5 TONS	10 EER	STAGE	LOWER ROOF - NORTH SIDE MIDDLE	1 YEAR	SPLIT SYSTEM MATCHED TO DX AIR HANDLING UNIT
AC / H-56	TRANE	RAUC-C254BB00	AIR COOLED CONDENSING UNIT	25 TONS	9.5 EER	CAFETERIA	LOWER ROOF - MIDDLE BACK SIDE	1 YEAR	MATCHED WITH TRANE PCC - PENTHOUSE CLIMATE CHANGER
AC / H-57	TRANE	RAUC-C254BB00	AIR COOLED CONDENSING UNIT	25 TONS	9.5 EER	CAFETERIA	LOWER ROOF - MIDDLE BACK SIDE	1 YEAR	MATCHED WITH TRANE PCC - PENTHOUSE CLIMATE CHANGER
AC / H-58	BORG WARNER	DDUT-T060AA	ROOFTOP HEAT PUMP	5 TONS	N/A	KITCHEN	LOWER ROOF - MIDDLE BACK SIDE	1 YEAR	ELECTRIC HEAT

## Crossroads South Middle School

TAG	MAKE	MODEL	TYPE	CAPACITY	EFFICIENCY	SERVES	LOCATION	REMAINING USEFUL LIFE	NOTES
AC / H-59	TRANE	*	AIR COOLED CONDENSING UNIT	25 TONS	9.5 EER	CAFETERIA	MIDDLE ROOF EAST SIDE	1 YEAR	MATCHED WITH TRANE PCC - PENTHOUSE CLIMATE CHANGER
AC / H-60	TRANE	*	AIR COOLED CONDENSING UNIT	25 TONS	9.5 EER	CAFETERIA	MIDDLE ROOF EAST SIDE	1 YEAR	MATCHED WITH TRANE PCC - PENTHOUSE CLIMATE CHANGER
AC / H-61	ARCOAIRE	PAMD75F1	PACKAGED ROOFTOP UNIT	7.5 TONS	N/A	CLOTHING LAB	LOWER ROOF BEHIND STAGE	1 YEAR	INTER CITY PRODUCTS
AC / H-62	*	*	PACKAGED ROOFTOP UNIT	*	N/A	N/A	LOWER ROOF BEHIND STAGE	1 YEAR	GAS HEAT
AC / H-63	REZNOR	*	PACKAGED ROOFTOP UNIT	*	N/A	CHILD DEVEL.	LOWER ROOF BEHIND STAGE	2 YEARS	GAS HEAT - MUA UNIT
AC / H-64	TRANE	YCD180B4H0 HB	ROOFTOP DX COOLING, GAS HEAT	15 TONS, 284 MBH OUTPUT, 350 MBH INPUT	11 EER, 80.7%	VOCAL MUSIC CLASSROOMS	LOWER ROOF - NORTH SIDE	14 YEARS	NATURAL GAS FIRED
AC / H-65	TRANE	RAUC-C754-B	AIR COOLED CONDENSING UNIT	7.5 TONS	10 EER	BAND ROOM	LOWER ROOF OVER BAND ROOM	1 YEAR	
AC / H-66	TRANE	RAUE -B256-A	AIR COOLED CONDENSING UNIT	2.5 TONS	10 EER	BAND ROOM	LOWER ROOF OVER BAND ROOM	1 YEAR	
AC / H-67	TRANE	RAUE -B256-A	AIR COOLED CONDENSING UNIT			BAND ROOM	LOWER ROOF OVER BAND ROOM	1 YEAR	
AC / H-68	LUXAIRE	*	PACKAGED ROOFTOP UNIT	*	N/A	CHILD DEVEL.	LOWER ROOF BY STAGE - NORTH END	1 YEAR	
AC / H-69	TRANE	RAUC-C404BD03ADF1	AIR COOLED CONDENSING UNIT	40 TONS	9.5 EER	AUDITORIUM	LOWER ROOF NORTH END FRONT	2 YEARS	
AC / H-70, 72, 74, 75, 76, 77, 78	TRANE	TTA-3030A4000AA	AIR COOLED CONDENSING UNIT	2.5 TONS	13 SEER	CLASSROOMS FRONT OF BUILDING	LOWER ROOF SOUTH FRONT OF BUILDING	15 YEARS	SPLIT SYSTEM MATCHED WITH TRANE DX VERTICAL FLOOR UNIT VENTILATORS
AC / H-71	BORG WARNER	D2-PF03A-06A	PACKAGED ROOFTOP UNIT	3 TONS	N/A	CLASSROOMS FRONT OF BUILDING	LOWER ROOF SOUTH FRONT OF BUILDING	2 YEARS	SIGNIFICANT RUST ON EXTERIOR
AC / H-73	BORG WARNER	D2-PF03A-06A	PACKAGED ROOFTOP UNIT	3 TONS	N/A	CLASSROOMS FRONT OF BUILDING	LOWER ROOF SOUTH FRONT OF BUILDING	2 YEARS	SIGNIFICANT RUST ON EXTERIOR
AH-4	TRANE	CCDB06-BNBC	AIR HANDLING UNIT	3000 CFM	N/A	SPS	SPS MEZZ	5 YEARS	INSTALLED 1981
AH-5	TRANE	CCDB06-BNBC	AIR HANDLING UNIT	3000 CFM	N/A	SPS	SPS MEZZ	5 YEARS	INSTALLED 1981
AH-6	TRANE	CCDB06-BNBC	AIR HANDLING UNIT	3000 CFM	N/A	SPS	SPS MEZZ	5 YEARS	INSTALLED 1981
AH-7	TRANE	CCDB06-BNBC	AIR HANDLING UNIT	3000 CFM	N/A	SPS	SPS MEZZ	5 YEARS	INSTALLED 1981
AH-8	TRANE	CCDB08BNB C	AIR HANDLING UNIT	4000 CFM	N/A	MUSIC ROOM	CEILING OF PROP ROOM	5 YEARS	INSTALLED 1981
SAH-1	MCQUAY	LSL-22CH	AIR HANDLING UNIT		N/A	LOCKER ROOMS	MEZZ LEVEL - OVER LOCKER ROOM	7 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL
SAH-2	MCQUAY	LHD -228CH	AIR HANDLING UNIT		N/A	LOCKER ROOM OFFICES	MEZZ LEVEL - OVER LOCKER ROOM	7 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL
SAH-3	MCQUAY	LHD-228CH	AIR HANDLING UNIT		N/A	SHOP AREAS	SHOP MEZZ	7 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL
SAH-4	MCQUAY	LHD-111CH	AIR HANDLING UNIT		N/A	SHOP AREAS	SHOP MEZZ	7 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL
SAH-5	MCQUAY	LHD-111CH	AIR HANDLING UNIT		N/A	SHOP AREAS	SHOP MEZZ	7 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL
SAH-6	MCQUAY	LDH-106CH	AIR HANDLING UNIT		N/A	SHOP AREAS	SHOP MEZZ	7 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL
SAH-8	MCQUAY	*	AIR HANDLING UNIT		N/A	ELECTRIC SHOP	SHOP MEZZ	8 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL
SAH-9	MCQUAY	LDH-104CH	AIR HANDLING UNIT		N/A	SHOP AREAS	SHOP MEZZ	7 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL
FAH-1	MCQUAY	LSL-228CH	AIR HANDLING UNIT		N/A	LOCKER ROOMS & OFFICES	MEZZ LEVEL - OVER LOCKER ROOM	7 YEARS	INDOOR - FLOOR MOUNTED, DX COOLING COIL / HW HEATING COIL

## Crossroads South Middle School

TAG	MAKE	MODEL	TYPE	CAPACITY	EFFICIENCY	SERVES	LOCATION	REMAINING USEFUL LIFE	NOTES
S-AHU-1	TRANE	SFHF-404JA45	ROOFTOP DX COOLING, GAS HEAT	40 TONS	9.5 EER	GYM	PAD MOUNTED BEHIND GYM	15 YEARS	INSTALLED 2008
S-AHU-2	TRANE	SFHF-404JA46	ROOFTOP DX COOLING, GAS HEAT	41 TONS	82% HEATING	GYM	PAD MOUNTED BEHIND GYM	15 YEARS	INSTALLED 2008
B-1	CLEVER BROOKS	CB200-150	HOT WATER FIRE TUBE	6,277 MBH INPUT	N/A	GYM, LOCKER ROOMS, OFFICES	NEW BOILER ROOM BY GYM	2 YEARS	INSTALLED 4/22/1981, NATURAL GAS FIRED
B-1A	WEIL MCLAIN	2094	HOT WATER FIRE TUBE	5,520 MBH INPUT	N/A	BUILDING LOOP EXCEPT GYM	OLD BOILER ROOM	TO BE DETERMINED	B-1A & B-2A SEQUENCED FOR EQUAL OPERATING TIME VERY OLD, PROBABLY 1959 ORIGINAL BOILER.
B-2A	WEIL MCLAIN	2094 - SERIES 3	HOT WATER FIRE TUBE	6,856 MBH INPUT, 5,520 MBH OUTPUT	N/A	BUILDING LOOP EXCEPT GYM	OLD BOILER ROOM	TO BE DETERMINED	VERY OLD, PROBABLY 1959 ORIGINAL BOILER.
DHW-1	BRADFORD WHITE	D100T1993N	HOT WATER HEATER WITH STORAGE	199 MBH, 98 GALLON	83%	NOT BEING USED	NEW BOILER ROOM BY GYM	18 YEARS	
DHW-2	BRADFORD WHITE	D75T1253N	HOT WATER HEATER WITH STORAGE	125 MBH, 75 GALLON	83%	ENTIRE SCHOOL	OLD BOILER ROOM	UNDER REPAIR	113.6 GAL/HR RECOVERY, MAGNUM-HYDROJET.
P-1	ARMSTRONG	4G4030	BASE MOUNTED END SUCTION - CONSTANT SPEED	480 GPM @ 108 FT.	N/A	ENTIRE SCHOOL, EXCEPT GYM	OLD BOILER ROOM	5 YEARS	LEAD / LAG HOT WATER PUMPS RUN WITH HEATING LOAD. ONE PUMP IS STAND-BY.
P-2	ARMSTRONG	4G4030	BASE MOUNTED END SUCTION - CONSTANT SPEED	20 HP, 480 GPM @ 108 FT. HD.	N/A	ENTIRE SCHOOL, EXCEPT GYM	OLD BOILER ROOM	5 YEARS	LEAD / LAG HOT WATER PUMPS RUN WITH HEATING LOAD. ONE PUMP IS STAND-BY.
P-3	ARMSTRONG	N/A	BASE MOUNTED END SUCTION - CONSTANT SPEED	10 HP, 208 GPM @ 85 FT. HD.	N/A	GYM HEATING LOOP	NEW BOILER ROOM BY GYM	5 YEARS	LEAD / LAG HOT WATER PUMPS RUN WITH HEATING LOAD. ONE PUMP IS STAND-BY.
P-4	ARMSTRONG	N/A	BASE MOUNTED END SUCTION - CONSTANT SPEED	10 HP, 208 GPM @ 85 FT. HD.	N/A	GYM HEATING LOOP	NEW BOILER ROOM BY GYM	5 YEARS	LEAD / LAG HOT WATER PUMPS RUN WITH HEATING LOAD. ONE PUMP IS STAND-BY.
P-5	ARMSTRONG	N/A	BASE MOUNTED END SUCTION - CONSTANT SPEED	5 HP, 63 GPM @ 65 FT. HD.	N/A	SAH-1 & 2, FAH-1	MEZZ LEVEL - OVER LOCKER ROOM	5 YEARS	LEAD / LAG HOT WATER PUMPS RUN WITH HEATING LOAD. ONE PUMP IS STAND-BY.
P-6	ARMSTRONG	N/A	BASE MOUNTED END SUCTION - CONSTANT SPEED	5 HP, 63 GPM @ 65 FT. HD.	N/A	SAH-1 & 2, FAH-1	MEZZ LEVEL - OVER LOCKER ROOM	5 YEARS	LEAD / LAG HOT WATER PUMPS RUN WITH HEATING LOAD. ONE PUMP IS STAND-BY.
DHWG	SELLER ENGR.	RBWE140-VT1300	HOT WATER GENERATOR	1,300 GALLON STORAGE, 1,400 GAL./HR REC.	N/A	ENTIRE SCHOOL	OLD BOILER ROOM	5 YEARS	
DWP-1	B & G	N/A	IN-LINE PIPE MOUNTED	1/2 HP	N/A	DHWG	OLD BOILER ROOM	7 YEARS	



# STATEMENT OF ENERGY PERFORMANCE

## Crossroads South Middle School

**Building ID:** 1819611

**For 12-month Period Ending:** May 31, 2008<sup>1</sup>

**Date SEP becomes ineligible:** N/A

**Date SEP Generated:** August 20, 2009

**Facility**  
Crossroads South Middle School  
195 Major Road  
Monmouth Junction, NJ 08852

**Facility Owner**  
N/A

**Primary Contact for this Facility**  
N/A

**Year Built:** 1959

**Gross Floor Area (ft<sup>2</sup>):** 190,000

**Energy Performance Rating<sup>2</sup> (1-100)** 49

### Site Energy Use Summary<sup>3</sup>

Natural Gas (kBtu) <sup>4</sup>	7,679,097
Electricity (kBtu)	6,078,887
Total Energy (kBtu)	13,757,984

### Energy Intensity<sup>5</sup>

Site (kBtu/ft <sup>2</sup> /yr)	73
Source (kBtu/ft <sup>2</sup> /yr)	150

### Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO <sub>2</sub> e/year)	1,371
---	-------

### Electric Distribution Utility

PSE&G - Public Service Elec & Gas Co

### National Average Comparison

National Average Site EUI	72
National Average Source EUI	149
% Difference from National Average Source EUI	1%
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<sup>6</sup> for Indoor Environmental Conditions:

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

### Certifying Professional

N/A

#### Notes:

- 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.
- 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.
- Values represent energy consumption, annualized to a 12-month period.
- Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
- Values represent energy intensity, annualized to a 12-month period.
- 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) 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 in double-checking the information that the building owner or operator has entered into Portfolio Manager.

**Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.**

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	<input checked="" type="checkbox"/>
<b>Building Name</b>	Crossroads South Middle School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		<input type="checkbox"/>
<b>Type</b>	K-12 School	Is this an accurate description of the space in question?		<input type="checkbox"/>
<b>Location</b>	195 Major Road, Monmouth Junction, NJ 08852	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		<input type="checkbox"/>
<b>Single Structure</b>	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		<input type="checkbox"/>
Crossroads South Middle School (K-12 School)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	<input checked="" type="checkbox"/>
<b>Gross Floor Area</b>	190,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		<input type="checkbox"/>
<b>Open Weekends?</b>	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.		<input type="checkbox"/>
<b>Number of PCs</b>	333 (Default)	Is this the number of personal computers in the K12 School?		<input type="checkbox"/>
<b>Number of walk-in refrigeration/freezer units</b>	1	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		<input type="checkbox"/>
<b>Presence of cooking facilities</b>	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		<input type="checkbox"/>
<b>Percent Cooled</b>	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		<input type="checkbox"/>
<b>Percent Heated</b>	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		<input type="checkbox"/>

<b>Months</b>	12 (Optional)	Is this school in operation for at least 8 months of the year?	<input type="checkbox"/>
<b>High School?</b>	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'.	<input type="checkbox"/>

## ENERGY STAR® Data Checklist for Commercial Buildings

### Energy Consumption

**Power Generation Plant or Distribution Utility:** PSE&G - Public Service Elec & Gas Co

Fuel Type: Electricity		
Meter: Electricity (kWh (thousand Watt-hours)) Space(s): Entire Facility		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
05/01/2008	05/31/2008	142,177.00
04/01/2008	04/30/2008	140,952.00
03/01/2008	03/31/2008	150,208.00
02/01/2008	02/29/2008	168,327.00
01/01/2008	01/31/2008	186,101.00
12/01/2007	12/31/2007	166,365.00
11/01/2007	11/30/2007	142,942.00
10/01/2007	10/31/2007	153,266.00
09/01/2007	09/30/2007	144,740.00
08/01/2007	08/31/2007	117,817.00
07/01/2007	07/31/2007	122,433.00
06/01/2007	06/30/2007	146,292.00
<b>Electricity Consumption (kWh (thousand Watt-hours))</b>		<b>1,781,620.00</b>
<b>Electricity Consumption (kBtu)</b>		<b>6,078,887.44</b>
<b>Total Electricity Consumption (kBtu)</b>		<b>6,078,887.44</b>
<b>Is this the total Electricity consumption at this building including all Electricity meters?</b>		<input type="checkbox"/>

Fuel Type: Natural Gas		
Meter: Gas (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
04/06/2008	05/05/2008	5,260.00
03/06/2008	04/05/2008	2,840.00
02/06/2008	03/05/2008	7,710.00
01/06/2008	02/05/2008	7,580.00
12/06/2007	01/05/2008	8,670.00
11/06/2007	12/05/2007	6,880.00
10/06/2007	11/05/2007	310.00
09/06/2007	10/05/2007	0.00
08/06/2007	09/05/2007	0.00

07/06/2007	08/05/2007	0.00
06/06/2007	07/05/2007	0.00
<b>Gas Consumption (therms)</b>		<b>39,250.00</b>
<b>Gas Consumption (kBtu)</b>		<b>3,925,000.00</b>
<b>Meter: Gas #2 (therms)</b> <b>Space(s): Entire Facility</b>		
<b>Start Date</b>	<b>End Date</b>	<b>Energy Use (therms)</b>
04/06/2008	05/05/2008	1,390.00
03/06/2008	04/05/2008	5,120.00
02/06/2008	03/05/2008	6,390.00
01/06/2008	02/05/2008	7,150.00
12/06/2007	01/05/2008	9,830.00
11/06/2007	12/05/2007	5,550.00
10/06/2007	11/05/2007	390.00
09/06/2007	10/05/2007	0.00
08/06/2007	09/05/2007	0.00
07/06/2007	08/05/2007	0.00
06/06/2007	07/05/2007	10.00
<b>Gas #2 Consumption (therms)</b>		<b>35,830.00</b>
<b>Gas #2 Consumption (kBtu)</b>		<b>3,583,000.00</b>
<b>Total Natural Gas Consumption (kBtu)</b>		<b>7,508,000.00</b>
<b>Is this the total Natural Gas consumption at this building including all Natural Gas meters?</b>		<input type="checkbox"/>

<b>Additional Fuels</b>	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	<input type="checkbox"/>

### Certifying Professional

(When applying for the ENERGY STAR, this must be the same PE 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**  
 Crossroads South Middle School  
 195 Major Road  
 Monmouth Junction, NJ 08852

**Facility Owner**  
 N/A

**Primary Contact for this Facility**  
 N/A

## General Information

Crossroads South Middle School	
Gross Floor Area Excluding Parking: (ft <sup>2</sup> )	190,000
Year Built	1959
For 12-month Evaluation Period Ending Date:	May 31, 2008

## Facility Space Use Summary

Crossroads South Middle School	
Space Type	K-12 School
Gross Floor Area(ft <sup>2</sup> )	190,000
Open Weekends?	Yes
Number of PCs <sup>d</sup>	333
Number of walk-in refrigeration/freezer units	1
Presence of cooking facilities	Yes
Percent Cooled	100
Percent Heated	100
Months <sup>o</sup>	12
High School?	No
School District <sup>o</sup>	N/A

## Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 05/31/2008)	Baseline (Ending Date 05/31/2008)	Rating of 75	Target	National Average
Energy Performance Rating	49	49	75	N/A	50
Energy Intensity					
<i>Site (kBtu/ft<sup>2</sup>)</i>	73	73	57	N/A	72
<i>Source (kBtu/ft<sup>2</sup>)</i>	150	150	116	N/A	149
Energy Cost					
<i>\$/year</i>	\$ 391,836.64	\$ 391,836.64	\$ 304,445.13	N/A	\$ 389,309.01
<i>\$/ft<sup>2</sup>/year</i>	\$ 2.06	\$ 2.06	\$ 1.60	N/A	\$ 2.05
Greenhouse Gas Emissions					
MtCO <sub>2</sub> e/year	1,371	1,371	1,065	N/A	1,362
kgCO <sub>2</sub> e/ft <sup>2</sup> /year	7	7	5	N/A	7

More than 50% of your building is defined as K-12 School. Please note that your rating accounts for all of the spaces listed. The National Average column presents energy performance data your building would have if your building had an average rating of 50.

Notes:

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

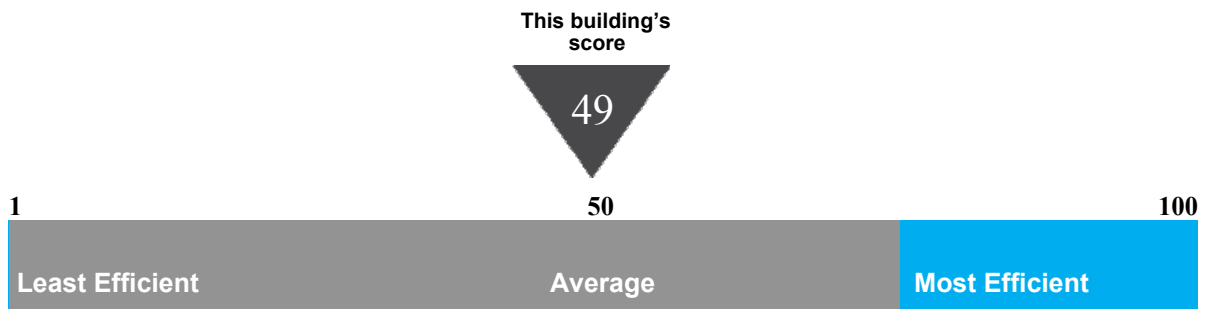
# Statement of Energy Performance

## 2008

Crossroads South Middle School  
195 Major Road  
Monmouth Junction, NJ 08852

Portfolio Manager Building ID: 1819611

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](http://energystar.gov/benchmark).



This building uses 150 kBtu per square foot per year.\*

\*Based on source energy intensity for the 12 month period ending May 2008

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](http://energystar.gov)

Date of certification



Appendix E

**Lighting Analysis**  
**Cross Roads South Middle School**

CEG Project #: 9C08134

Project Name : South Brunswick Schools Energy Audit

Address: 195 Major Road

City, State: Monmouth Junction, NJ.

Page 1 of 11

Date 2/12/10

kWh Cost \$0.146

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
<b>First Floor</b>															
Computer Science Lab	900	15	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	825	\$108.41	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Office Testing	750	4	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	220	\$24.09	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Stair	1800	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$28.91	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Custordial Closet	400	1	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	87	\$5.08	1	Existing to Remain	87	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Girls Room	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Girls Room	300	2	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	174	\$7.62	2	Existing to Remain	174	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	3	(1)32w Triple Tube CF Lamp. Hi Hat Fixture - 32w	96	\$22.71	3	Existing to Remain	96	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Room	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Room	300	2	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	174	\$7.62	2	Existing to Remain	174	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Janitor's Closet	400	1	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	55	\$3.21	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Stair	1800	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$28.91	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00

2/12/2010

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Girls Room	300	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$7.23	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Custordial Closet	400	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$6.42	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Stair	1800	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$28.91	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	18	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	990	\$234.15	18	Existing to Remain	990	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Special Education Classroom	1620	18	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	990	\$234.15	18	Existing to Remain	990	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Book Room	500	2	(3)13w CF Lamps. Surface Square' Fixture - 128w	256	\$18.69	2	Existing to Remain	256	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor	1800	5	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	275	\$72.27	5	Existing to Remain	275	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor	1800	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$216.81	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor	1800	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$43.36	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Faculty Toilet	300	2	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	216	\$9.46	2	Existing to Remain	216	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Faculty Toilet	300	1	(2)32w T8 Lamps. Plastic Fixture w/Elec. Ballast - 55w	55	\$2.41	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00

2/12/2010

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Faculty Toilet	300	2	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	216	\$9.46	2	Existing to Remain	216	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Faculty Toilet	300	1	(2)32w T8 Lamps. Plastic Fixture w/Elec. Ballast - 55w	55	\$2.41	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Librarian's Office	1800	3	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	324	\$85.15	3	Existing to Remain	324	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Library Office	1880	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$181.16	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Library Entrance	1800	1	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	108	\$28.38	1	Existing to Remain	108	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Library Entrance	1800	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$57.82	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Library Entrance	1800	4	(1)32w T8 Lamps. 6" x 4' Fixture w/Elec. Ballast - 28w	112	\$29.43	4	Existing to Remain	112	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Library Audio Room	1600	1	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	55	\$12.85	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Reading Classroom	1600	12	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	1296	\$302.75	12	Existing to Remain	1296	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$156.10	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - North	1800	5	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	275	\$72.27	5	Existing to Remain	275	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - East	1800	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$216.81	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - West	1800	22	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1210	\$317.99	22	Existing to Remain	1210	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - West	1800	16	(1)32w T8 Lamps. 6" x 4' Fixture w/Elec. Ballast - 28w	448	\$117.73	16	Existing to Remain	448	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Original Main Office New Nurse's Suite	1450	14	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	1218	\$257.85	14	Existing to Remain	1218	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Original Main Office New Nurse's Suite	1450	4	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	432	\$91.45	4	Existing to Remain	432	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Original Main Office New Nurse's Suite	1450	2	(3)13w CF Lamps. Surface Square' Fixture - 128w	256	\$54.20	2	Existing to Remain	256	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Original Main Office New Lunch Room, Toilets, Etc.	1080	20	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1100	\$173.45	20	Existing to Remain	1100	0	0	\$0.00		\$0.00	\$0.00	\$0.00

2/12/2010

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Original Main Office New Lunch Room, Toilets, Etc.	1080	3	(3)13w CF Lamps. Surface Square' Fixture - 128w	384	\$60.55	3	Existing to Remain	384	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Original Main Office New Lunch Room, Toilets, Etc.	1080	12	(1)32w Triple Tube CF Lamp. Hi Hat Fixture - 32w	384	\$60.55	12	Existing to Remain	384	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Library Book Racks	1600	86	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	9288	\$2,169.68	86	Existing to Remain	9288	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Main Office	2000	56	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	6048	\$1,766.02	56	Existing to Remain	6048	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - North	1800	20	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	1740	\$457.27	20	Existing to Remain	1740	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Lobby	1800	12	(1)32w T8 Lamps. 6" x 4' Fixture w/Elec. Ballast - 28w	336	\$88.30	12	Existing to Remain	336	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Lobby - Reception Area	1800	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$57.82	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	24	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1320	\$312.21	24	Existing to Remain	1320	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Book Room	1600	2	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	174	\$40.65	2	Existing to Remain	174	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Book Room	1600	2	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	174	\$40.65	2	Existing to Remain	174	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Girls Room	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Room	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Auditorium Lobby	1800	8	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	696	\$182.91	8	Existing to Remain	696	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Auditorium	300	36	(1)150 Inc. Lamps. Hi-hat Fixture - 150w	10800	\$473.04	36	Existing to Remain	10800	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Stage Wor Lights	200	14	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	770	\$22.48	14	Existing to Remain	770	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Music Office	500	1	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	87	\$6.35	1	Existing to Remain	87	0	0	\$0.00		\$0.00	\$0.00	\$0.00

2/12/2010

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Uniform Stage Room	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Uniform Stage Room	300	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$9.64	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Music Room	1000	48	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	2640	\$385.44	48	Existing to Remain	2640	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Passage	300	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$14.45	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Vocal Music Room	500	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$48.18	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Music Resources	500	4	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	432	\$31.54	4	Existing to Remain	432	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Auditorium Storage	300	10	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	550	\$24.09	10	Existing to Remain	550	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Storage Room	500	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$24.09	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Special Education Classroom	1620	8	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	440	\$104.07	8	Existing to Remain	440	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Special Education Classroom	1620	8	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	440	\$104.07	8	Existing to Remain	440	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - North	1800	11	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	957	\$251.50	11	Existing to Remain	957	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - West Auditorium	1800	9	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	783	\$205.77	9	Existing to Remain	783	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Child Development	1620	28	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1540	\$364.24	28	Existing to Remain	1540	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Child Development	1620	1	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	108	\$25.54	1	Existing to Remain	108	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Foods Lab	1620	23	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1265	\$299.20	23	Existing to Remain	1265	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Foods Lab	1620	1	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	108	\$25.54	1	Existing to Remain	108	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Clothing Lab	1620	24	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1320	\$312.21	24	Existing to Remain	1320	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - East	1800	6	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	522	\$137.18	6	Existing to Remain	522	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - North	1800	12	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	1044	\$274.36	12	Existing to Remain	1044	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - East	1800	3	(2)T8 "U" Lamps. Surface Fixture w/Elec. Ballast - 55w	165	\$43.36	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - East	1800	6	(1)32w T8 Lamps. 6" x 4' Fixture w/Elec. Ballast - 28w	168	\$44.15	6	Existing to Remain	168	0	0	\$0.00		\$0.00	\$0.00	\$0.00

2/12/2010

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Cafeteria	500	16	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	1728	\$126.14	16	Existing to Remain	1728	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Cafeteria	500	14	(1)32w Triple Tube CF Lamp. Hi Hat Fixture - 32w	448	\$32.70	14	Existing to Remain	448	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Cafeteria	500	30	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	3240	\$236.52	30	Existing to Remain	3240	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Commons Area	600	36	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1980	\$173.45	36	Existing to Remain	1980	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Dish Washing Area	900	2	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	174	\$22.86	2	Existing to Remain	174	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Kitchen	900	23	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	2001	\$262.93	23	Existing to Remain	2001	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Cooking	900	2	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	174	\$22.86	2	Existing to Remain	174	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Staff Dining	600	15	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	1620	\$141.91	15	Existing to Remain	1620	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Café Two	300	4	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	220	\$9.64	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Girls Café Two	300	4	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	220	\$9.64	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Ass't. Principal's Office	1600	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$25.70	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Storage Room	500	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$8.03	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Storage Room	500	2	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	216	\$15.77	2	Existing to Remain	216	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Waiting & Secretary	900	6	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	648	\$85.15	6	Existing to Remain	648	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Ass't. Principal's Office	1600	2	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	174	\$40.65	2	Existing to Remain	174	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Publication	600	4	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	432	\$37.84	4	Existing to Remain	432	0	0	\$0.00		\$0.00	\$0.00	\$0.00
School Store	600	6	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	522	\$45.73	6	Existing to Remain	522	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Distr. Ed. Classroom	1620	18	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	1566	\$370.39	18	Existing to Remain	1566	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Lockers	400	2	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	216	\$12.61	2	Existing to Remain	216	0	0	\$0.00		\$0.00	\$0.00	\$0.00

2/12/2010

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Lockers	400	1	(2)T8 "U" Lamps. Surface Fixture w/Elec. Ballast - 55w	55	\$3.21	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Graphic Arts	1400	21	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	2268	\$463.58	21	Existing to Remain	2268	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Dark room	500	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$24.09	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Drawing & Art Classroom	1620	9	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	783	\$185.20	9	Existing to Remain	783	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Two Short Corridor To Main Office	800	4	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	220	\$25.70	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	6	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	648	\$153.26	6	Existing to Remain	648	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor	1800	3	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	165	\$43.36	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Printing Classroom	1200	24	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1320	\$231.26	24	Existing to Remain	1320	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Ceramics Classroom	1200	30	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	3240	\$567.65	30	Existing to Remain	3240	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Art Classroom	1200	3	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	261	\$45.73	3	Existing to Remain	261	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Press Room	1200	4	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	348	\$60.97	4	Existing to Remain	348	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Ceramic Storage	300	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$7.23	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Craft Storage	300	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$7.23	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Career, Guidance, Worry, Conf., Etc.	1400	30	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1650	\$337.26	30	Existing to Remain	1650	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Illuminates over Balconies	1800	8	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	440	\$115.63	8	Existing to Remain	440	0	0	\$0.00		\$0.00	\$0.00	\$0.00
General Wood Shop	1400	47	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	2585	\$528.37	47	Existing to Remain	2585	0	0	\$0.00		\$0.00	\$0.00	\$0.00
General Wood Shop Mezz.	300	10	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	550	\$24.09	10	Existing to Remain	550	0	0	\$0.00		\$0.00	\$0.00	\$0.00
General Metal Shop	1400	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$168.63	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
General Metal Shop	1400	21	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	2268	\$463.58	21	Existing to Remain	2268	0	0	\$0.00		\$0.00	\$0.00	\$0.00
General Metal Shop Mezz.	300	10	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	550	\$24.09	10	Existing to Remain	550	0	0	\$0.00		\$0.00	\$0.00	\$0.00

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Drafting & Planning Classroom	1400	30	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1650	\$337.26	30	Existing to Remain	1650	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Drafting & Planning Classroom Mezz.	300	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$9.64	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Electronics Classroom	1400	38	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	2090	\$427.20	38	Existing to Remain	2090	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Electronics Classroom	1400	5	(4)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 108w	540	\$110.38	5	Existing to Remain	540	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Electronics Classroom Mezz.	300	5	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	275	\$12.05	5	Existing to Remain	275	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Equipment Storage	300	21	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1155	\$50.59	21	Existing to Remain	1155	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Equipment Storage Mezz.	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Toilet	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Toilet	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - North	1800	10	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	550	\$144.54	10	Existing to Remain	550	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - West	1800	11	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	605	\$158.99	11	Existing to Remain	605	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor - North	1800	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$216.81	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Athletic Equipment Storage	300	10	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	550	\$24.09	10	Existing to Remain	550	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Comm. Services & Misc. equipment	500	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$48.18	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boiler Room	400	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$6.42	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Electrical room	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Team Room	300	18	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	990	\$43.36	18	Existing to Remain	990	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Lockers	300	27	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1485	\$65.04	27	Existing to Remain	1485	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Staff	800	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$38.54	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Trainer	1200	12	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	660	\$115.63	12	Existing to Remain	660	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Staff	800	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$38.54	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Staff Showers	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Girls Staff Showres	300	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$4.82	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Toilets	300	4	(2)32w T8 Lamps. Plastic Fixture w/Elec. Ballast - 55w	220	\$9.64	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Girls Toilets	300	4	(2)32w T8 Lamps. Plastic Fixture w/Elec. Ballast - 55w	220	\$9.64	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Mechanical Equipment Mezz.	200	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$4.82	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Girls Team Room	300	8	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	440	\$19.27	8	Existing to Remain	440	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Mens Toilets	300	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$9.64	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Mens Toilets	300	3	(1)32w T8 Lamps. 6" x 4' Fixture w/Elec. Ballast - 28w	84	\$3.68	3	Existing to Remain	84	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Womens Toilets	300	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$9.64	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Womens Toilets	300	3	(1)32w T8 Lamps. 6" x 4' Fixture w/Elec. Ballast - 28w	84	\$3.68	3	Existing to Remain	84	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Ticket Booth	100	1	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	55	\$0.80	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Janitor's Closet	300	1	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	55	\$2.41	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Snack Bar	200	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$4.82	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Electrical room	200	1	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	55	\$1.61	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Ticket Booth	100	1	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	55	\$0.80	1	Existing to Remain	55	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Gymnasium	1200	66	(8)42w T42 Lamps. Hi-hat Fixture - 318w	20988	\$3,677.10	66	Existing to Remain	20988	0	0	\$0.00		\$0.00	\$0.00	\$0.00
<b>First Floor Summary</b>		<b>1847</b>		<b>148997</b>	<b>\$26,154</b>	<b>1847</b>		<b>148997</b>	<b>0</b>	<b>0</b>	<b>\$0</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Second Floor</b>															
Chemistry Classroom	1620	32	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1760	\$416.28	32	Existing to Remain	1760	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Science Prep.	350	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$11.24	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Storage Room	500	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$8.03	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Science Prep.	350	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$11.24	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Stair	1800	2	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	110	\$28.91	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Stair	1800	1	(3)13w CF Lamps. Surface Square' Fixture - 128w	128	\$33.64	1	Existing to Remain	128	0	0	\$0.00		\$0.00	\$0.00	\$0.00

2/12/2010

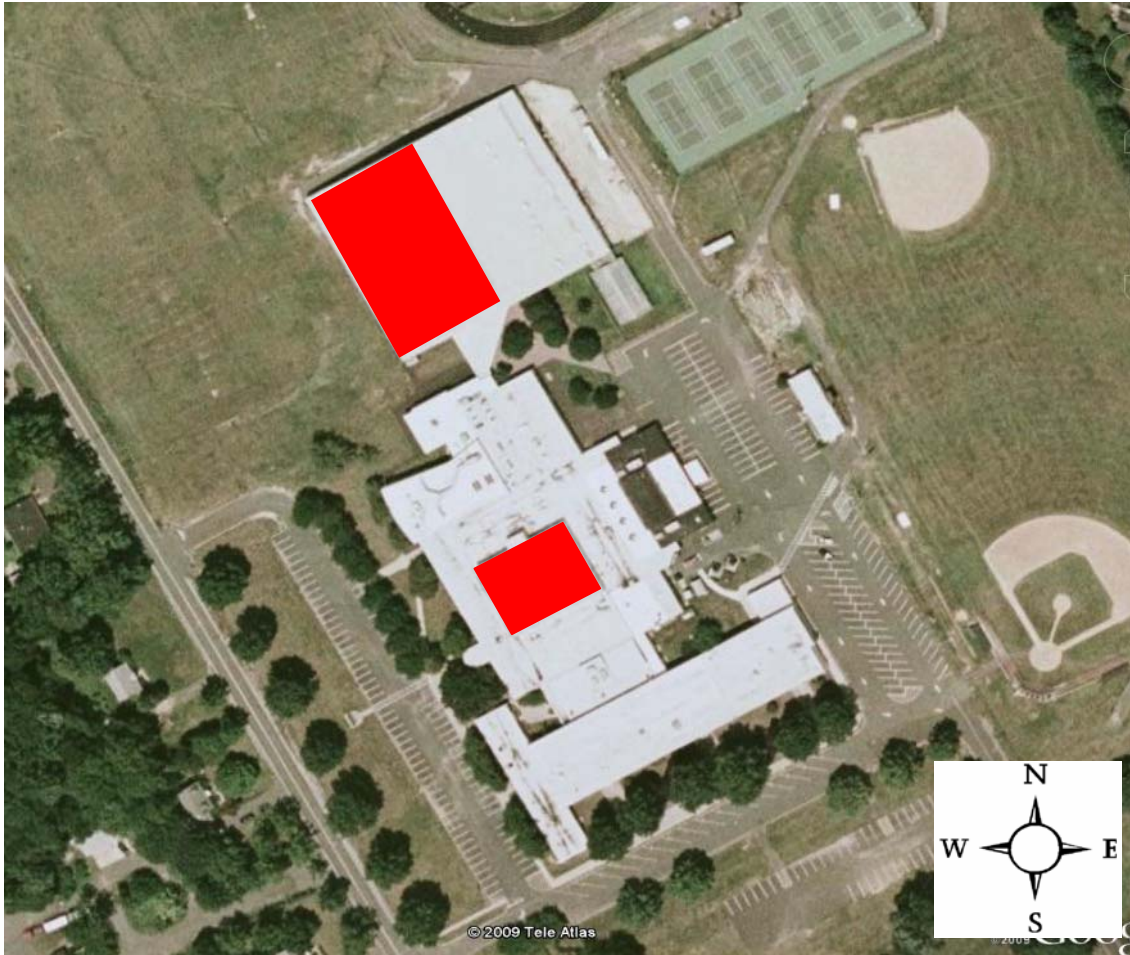
Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Faculty	600	1	(3)32w T8 Lamps. 2' x 4' Fixture w/Elec. Ballast - 87w	87	\$7.62	1	Existing to Remain	87	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Girls Room	300	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$7.23	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Biology Classroom	1620	30	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1650	\$390.26	30	Existing to Remain	1650	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Biology Classroom	1620	2	(1)32w Triple Tube CF Lamp. Hi Hat Fixture - 32w	64	\$15.14	2	Existing to Remain	64	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Science Prep.	350	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$16.86	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Science Resource	1620	9	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	495	\$117.08	9	Existing to Remain	495	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Faculty Toilet	300	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$7.23	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Janitor's Closet	300	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$7.23	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Storage Room	500	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$24.09	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Center Stair	1800	2	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	110	\$28.91	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Physics Lab	1620	24	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1320	\$312.21	24	Existing to Remain	1320	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Data Processing	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Storage Room	500	2	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	110	\$8.03	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Boys Room	300	3	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	165	\$7.23	3	Existing to Remain	165	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Faculty Workroom	900	4	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	220	\$28.91	4	Existing to Remain	220	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Business Resources	1620	8	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	440	\$104.07	8	Existing to Remain	440	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Stair	1800	2	(2)32w T8 Lamps. Pendant Fixture w/Elec. Ballast - 55w	110	\$28.91	2	Existing to Remain	110	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Stair	1800	1	(3)13w CF Lamps. Surface Square' Fixture - 128w	128	\$33.64	1	Existing to Remain	128	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Typing Classroom	1620	24	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1320	\$312.21	24	Existing to Remain	1320	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Storage Room	500	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$24.09	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Typing Classroom	1620	21	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1155	\$273.18	21	Existing to Remain	1155	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Office Practice	1620	20	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1100	\$260.17	20	Existing to Remain	1100	0	0	\$0.00		\$0.00	\$0.00	\$0.00

Fixture Location	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost		
	Usage, Hrs/Yr	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Annual Energy Cost	Fixt Qty	Lighting Fixture Description	Total Watts - Location	Energy Savings, Watts	Energy Savings, kWh/Yr	Savings/Yr, \$	Simple Payback, Yrs	Unit Cost, Installed	Total Cost, Installed	Rebate Estimate
Biology Classroom	1620	21	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1155	\$273.18	21	Existing to Remain	1155	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Biology Prep.	350	6	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	330	\$16.86	6	Existing to Remain	330	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Biology Classroom	1620	27	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1485	\$351.23	27	Existing to Remain	1485	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Science Classroom	1620	27	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1485	\$351.23	27	Existing to Remain	1485	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Science Prep.	350	14	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	770	\$39.35	14	Existing to Remain	770	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Science Classroom	1620	27	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1485	\$351.23	27	Existing to Remain	1485	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Classroom	1620	15	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	825	\$195.13	15	Existing to Remain	825	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Chemistry Classroom	1620	27	(2)32w T8 Lamps. 1' x 4' Fixture w/Elec. Ballast - 55w	1485	\$351.23	27	Existing to Remain	1485	0	0	\$0.00		\$0.00	\$0.00	\$0.00
Corridor	1800	46	(1)32w T8 Lamps. 6" x 4' Fixture w/Elec. Ballast - 28w	1288	\$338.49	46	Existing to Remain	1288	0	0	\$0.00		\$0.00	\$0.00	\$0.00
<b>Second Floor Summary</b>		<b>450</b>		<b>23640</b>	<b>\$4,987</b>	<b>450</b>		<b>23640</b>	<b>0</b>	<b>0</b>	<b>\$0</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
	<b>Totals:</b>	<b>2297</b>		<b>172637</b>	<b>\$31,140</b>	<b>2297</b>		<b>172637</b>	<b>0</b>	<b>0</b>	<b>\$0</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>COMMENTS:</b>															

<b>Project Name: Crossroads South Middle School</b> <b>Location: Monmouth Junction, NJ</b> <b>Description: Photovoltaic System 95% Financing - 20 year</b>									
<b>Simple Payback Analysis</b>									
		<b>Photovoltaic System 95% Financing - 20 year</b>							
Total Construction Cost		\$3,978,540							
Annual kWh Production		689,855							
Annual Energy Cost Reduction		\$100,719							
Annual SREC Revenue		\$241,449							
First Cost Premium		<b>\$3,978,540</b>							
Simple Payback:		<b>11.63</b> Years							
<b>Life Cycle Cost Analysis</b>									
Analysis Period (years):		25				Financing %:		95%	
Financing Term (mths):		240				Maintenance Escalation Rate:		3.0%	
Average Energy Cost (\$/kWh)		<b>\$0.146</b>				Energy Cost Escalation Rate:		3.0%	
Financing Rate:		7.00%				SREC Value (\$/kWh)		\$0.350	
Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	\$198,927	0	0	0	\$0	0	0	(198,927)	0
1	\$0	689,855	\$100,719	\$0	\$241,449	\$261,724	\$89,915	(\$9,472)	(\$208,399)
2	\$0	686,406	\$103,740	\$0	\$240,242	\$255,225	\$96,415	(\$7,657)	(\$216,056)
3	\$0	682,974	\$106,853	\$0	\$239,041	\$248,255	\$103,385	(\$5,746)	(\$221,802)
4	\$0	679,559	\$110,058	\$0	\$237,846	\$240,781	\$110,859	(\$3,736)	(\$225,538)
5	\$0	676,161	\$113,360	\$6,964	\$236,656	\$232,767	\$118,873	(\$8,588)	(\$234,126)
6	\$0	672,780	\$116,761	\$6,930	\$235,473	\$224,174	\$127,466	(\$6,335)	(\$240,461)
7	\$0	669,416	\$120,264	\$6,895	\$234,296	\$214,959	\$136,680	(\$3,975)	(\$244,436)
8	\$0	666,069	\$123,871	\$6,861	\$233,124	\$205,079	\$146,561	(\$1,504)	(\$245,941)
9	\$0	662,739	\$127,588	\$6,826	\$231,959	\$194,484	\$157,156	\$1,080	(\$244,860)
10	\$0	659,425	\$131,415	\$6,792	\$230,799	\$183,123	\$168,517	\$3,782	(\$241,078)
11	\$0	656,128	\$135,358	\$6,758	\$229,645	\$170,941	\$180,699	\$6,605	(\$234,473)
12	\$0	652,847	\$139,418	\$6,724	\$228,497	\$157,878	\$193,762	\$9,551	(\$224,922)
13	\$0	649,583	\$143,601	\$6,691	\$227,354	\$143,871	\$207,769	\$12,625	(\$212,297)
14	\$0	646,335	\$147,909	\$6,657	\$226,217	\$128,851	\$222,788	\$15,829	(\$196,468)
15	\$0	643,104	\$152,346	\$6,624	\$225,086	\$112,746	\$238,894	\$19,169	(\$177,299)
16	\$0	639,888	\$156,917	\$6,591	\$223,961	\$95,476	\$256,163	\$22,647	(\$154,652)
17	\$0	636,689	\$161,624	\$6,558	\$222,841	\$76,958	\$274,681	\$26,268	(\$128,384)
18	\$0	633,505	\$166,473	\$6,525	\$221,727	\$57,101	\$294,538	\$30,035	(\$98,349)
19	\$0	630,338	\$171,467	\$6,492	\$220,618	\$35,809	\$315,830	\$33,953	(\$64,396)
20	\$0	627,186	\$176,611	\$6,460	\$219,515	\$12,978	\$338,662	\$38,027	(\$26,370)
21	\$0	624,050	\$181,909	\$6,428	\$218,418	\$11,002	\$311,334	\$41,563	\$45,193
22	\$0	620,930	\$187,367	\$6,396	\$217,325	\$7,530	\$256,199	\$134,567	\$179,760
23	\$0	617,825	\$192,988	\$6,364	\$216,239	\$0	\$0	\$402,863	\$582,623
24	\$0	614,736	\$198,777	\$6,332	\$215,158	\$0	\$0	\$407,603	\$990,226
25	\$0	611,662	\$204,741	\$6,300	\$214,082	\$0	\$0	\$412,522	\$1,402,749
<b>Totals:</b>		13,160,987	\$2,706,353	\$107,349	\$4,606,345	\$3,253,179	\$3,779,613	\$4,347,146	(\$639,755)
<b>Net Present Value (NPV)</b>							<b>\$109,730</b>		
<b>Internal Rate of Return (IRR)</b>							<b>9.2%</b>		

Project Name: Crossroads South Middle School							
Location: Monmouth Junction, NJ							
Description: Photovoltaic System - Direct Purchase							
<b>Simple Payback Analysis</b>							
		<b>Photovoltaic System - Direct Purchase</b>					
Total Construction Cost	\$3,978,540						
Annual kWh Production	689,855						
Annual Energy Cost Reduction	\$100,719						
Annual SREC Revenue	\$241,449						
First Cost Premium		<b>\$3,978,540</b>					
Simple Payback:		<b>11.63</b>				Years	
<b>Life Cycle Cost Analysis</b>							
Analysis Period (years):	25			Financing %:	0%		
Financing Term (mths):	0			Maintenance Escalation Rate:	3.0%		
Average Energy Cost (\$/kWh)	<b>\$0.146</b>			Energy Cost Escalation Rate:	3.0%		
Financing Rate:	0.00%			SREC Value (\$/kWh)	\$0.350		
Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Net Cash Flow	Cumulative Cash Flow
0	\$3,978,540	0	0	0	\$0	(3,978,540)	0
1	\$0	689,855	\$100,719	\$0	\$241,449	\$342,168	(\$3,636,372)
2	\$0	686,406	\$103,740	\$0	\$240,242	\$343,982	(\$3,292,390)
3	\$0	682,974	\$106,853	\$0	\$239,041	\$345,893	(\$2,946,496)
4	\$0	679,559	\$110,058	\$0	\$237,846	\$347,904	(\$2,598,592)
5	\$0	676,161	\$113,360	\$6,964	\$236,656	\$343,052	(\$2,255,541)
6	\$0	672,780	\$116,761	\$6,930	\$235,473	\$345,304	(\$1,910,236)
7	\$0	669,416	\$120,264	\$6,895	\$234,296	\$347,664	(\$1,562,572)
8	\$0	666,069	\$123,871	\$6,861	\$233,124	\$350,135	(\$1,212,437)
9	\$0	662,739	\$127,588	\$6,826	\$231,959	\$352,720	(\$859,717)
10	\$0	659,425	\$131,415	\$6,792	\$230,799	\$355,422	(\$504,295)
11	\$0	656,128	\$135,358	\$6,758	\$229,645	\$358,244	(\$146,051)
12	\$0	652,847	\$139,418	\$6,724	\$228,497	\$361,191	\$215,140
13	\$0	649,583	\$143,601	\$6,691	\$227,354	\$364,264	\$579,404
14	\$0	646,335	\$147,909	\$6,657	\$226,217	\$367,469	\$946,873
15	\$0	643,104	\$152,346	\$6,624	\$225,086	\$370,809	\$1,317,682
16	\$0	639,888	\$156,917	\$6,591	\$223,961	\$374,287	\$1,691,969
17	\$0	636,689	\$161,624	\$6,558	\$222,841	\$377,907	\$2,069,876
18	\$0	633,505	\$166,473	\$6,525	\$221,727	\$381,675	\$2,451,550
19	\$0	630,338	\$171,467	\$6,492	\$220,618	\$385,593	\$2,837,143
20	\$0	627,186	\$176,611	\$6,460	\$219,515	\$389,666	\$3,226,809
21	\$1	624,050	\$181,909	\$6,428	\$218,418	\$393,899	\$3,620,709
22	\$2	620,930	\$187,367	\$6,396	\$217,325	\$398,297	\$4,019,005
23	\$3	617,825	\$192,988	\$6,364	\$216,239	\$402,863	\$4,421,868
24	\$4	614,736	\$198,777	\$6,332	\$215,158	\$407,603	\$4,829,471
25	\$5	611,662	\$204,741	\$6,300	\$214,082	\$412,522	\$5,241,993
<b>Totals:</b>		13,160,987	\$2,706,353	\$107,349	\$4,606,345	\$9,220,533	\$7,205,349
<b>Net Present Value (NPV)</b>						<b>\$5,242,018</b>	
<b>Internal Rate of Return (IRR)</b>						<b>7.6%</b>	

Building	Usable Roof Area (sq ft)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW	Total Annual kWh	Panel Weight (33 lbs)	W/SQFT
Crossroads South Middle	28,278	Sunpower SPR230	1922	14.7	28,261	442.06	689,855	63,426	15.64



Roof Area	24,000	90%	21,600 S.F.	1468 Panels	338 Kw
Roof Area	7,420	90%	<u>6,678 S.F.</u>	<u>454 Panels</u>	<u>104 Kw</u>
Total Roof Area			28,278 S.F.	1922 Panels	442 Kw

Notes:

1. Estimated kWh based on 4.68 hours full output per day per 365 day year. Actual kWh will vary day to day.

## ENERGY CONSUMPTION SUMMARY

By CAE

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
<b>BASE CASE</b>					
<b>Primary heating</b>					
Primary heating	361,770	7,385,700	61.8 %	8,620,421	11,478,954
Other Htg Accessories	53,015		1.3 %	180,941	542,878
<b>Heating Subtotal</b>	<b>414,785</b>	<b>7,385,700</b>	<b>63.1 %</b>	<b>8,801,362</b>	<b>12,021,832</b>
<b>Primary cooling</b>					
Cooling Compressor	276,129		6.8 %	942,427	2,827,564
Tower/Cond Fans	10,192		0.3 %	34,785	104,366
Condenser Pump			0.0 %	0	0
Other Clg Accessories	932		0.0 %	3,180	9,541
<b>Cooling Subtotal....</b>	<b>287,252</b>		<b>7.0 %</b>	<b>980,392</b>	<b>2,941,470</b>
<b>Auxiliary</b>					
Supply Fans	234,806		5.7 %	801,393	2,404,420
Pumps	107,800		2.6 %	367,921	1,103,873
Stand-alone Base Utilities	4,745		0.1 %	16,195	48,589
<b>Aux Subtotal....</b>	<b>347,351</b>		<b>8.5 %</b>	<b>1,185,509</b>	<b>3,556,882</b>
<b>Lighting</b>					
Lighting	824,179		20.2 %	2,812,924	8,439,615
<b>Receptacle</b>					
Receptacles	49,678		1.2 %	169,550	508,700
<b>Cogeneration</b>					
Cogeneration			0.0 %	0	0
<b>Totals</b>					
<b>Totals**</b>	<b>1,923,245</b>	<b>7,385,700</b>	<b>100.0 %</b>	<b>13,949,736</b>	<b>27,468,500</b>

\* Note: Resource Utilization factors are included in the Total Source Energy value.

\*\* Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name:  
Dataset Name: P:\PROJECTS 2009\BS09-002 SOUTH BRUNS SCHOOLS LGEA\TRACE\CROSSROADS  
SOUTH\CROSSROADSSOUTH.TRC

TRACE® 700 v6.2 calculated at 10:53 AM on 11/20/2009  
Alternative - 1 Energy Consumption Summary report page 1

## ENERGY CONSUMPTION SUMMARY

By CAE

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
<b>ECM #1 VFD PUMPS</b>					
<b>Primary heating</b>					
Primary heating	361,770	7,385,700	63.3 %	8,620,421	11,478,954
Other Htg Accessories	53,015		1.3 %	180,941	542,878
<b>Heating Subtotal</b>	<b>414,785</b>	<b>7,385,700</b>	<b>64.6 %</b>	<b>8,801,362</b>	<b>12,021,832</b>
<b>Primary cooling</b>					
Cooling Compressor	276,129		6.9 %	942,427	2,827,564
Tower/Cond Fans	10,192		0.3 %	34,785	104,366
Condenser Pump			0.0 %	0	0
Other Clg Accessories	932		0.0 %	3,180	9,541
<b>Cooling Subtotal....</b>	<b>287,252</b>		<b>7.2 %</b>	<b>980,392</b>	<b>2,941,470</b>
<b>Auxiliary</b>					
Supply Fans	234,806		5.9 %	801,393	2,404,420
Pumps	10,751		0.3 %	36,692	110,087
Stand-alone Base Utilities	4,745		0.1 %	16,195	48,589
<b>Aux Subtotal....</b>	<b>250,302</b>		<b>6.3 %</b>	<b>854,280</b>	<b>2,563,097</b>
<b>Lighting</b>					
Lighting	824,179		20.7 %	2,812,924	8,439,615
<b>Receptacle</b>					
Receptacles	49,678		1.2 %	169,550	508,700
<b>Cogeneration</b>					
Cogeneration			0.0 %	0	0
<b>Totals</b>					
<b>Totals**</b>	<b>1,826,196</b>	<b>7,385,700</b>	<b>100.0 %</b>	<b>13,618,507</b>	<b>26,474,714</b>

\* Note: Resource Utilization factors are included in the Total Source Energy value.

\*\* Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name:  
Dataset Name: P:\PROJECTS 2009\BS09-002 SOUTH BRUNS SCHOOLS LGEA\TRACE\CROSSROADS  
SOUTH\CROSSROADSSOUTH.TRC

TRACE® 700 v6.2 calculated at 10:53 AM on 11/20/2009  
Alternative - 2 Energy Consumption Summary report page 1

NOTE: ECM#2 DOESN'T HAVE A TRACE OUTPUT. CALCULATIONS WERE DONE MANUALLY.

## ENERGY CONSUMPTION SUMMARY

By CAE

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
<b>ECM #3 CAFE RTU REPLACEMENT</b>					
<b>Primary heating</b>					
Primary heating	57,271	8,617,068	62.5 %	8,812,535	9,657,058
Other Htg Accessories	53,015		1.3 %	180,941	542,878
<b>Heating Subtotal</b>	<b>110,287</b>	<b>8,617,068</b>	<b>63.8 %</b>	<b>8,993,476</b>	<b>10,199,936</b>
<b>Primary cooling</b>					
Cooling Compressor	272,429		6.6 %	929,799	2,789,676
Tower/Cond Fans	11,467		0.3 %	39,136	117,419
Condenser Pump			0.0 %	0	0
Other Clg Accessories	1,175		0.0 %	4,011	12,033
<b>Cooling Subtotal....</b>	<b>285,070</b>		<b>6.9 %</b>	<b>972,946</b>	<b>2,919,128</b>
<b>Auxiliary</b>					
Supply Fans	225,519		5.5 %	769,695	2,309,315
Pumps	107,800		2.6 %	367,921	1,103,873
Stand-alone Base Utilities	4,745		0.1 %	16,195	48,589
<b>Aux Subtotal....</b>	<b>338,063</b>		<b>8.2 %</b>	<b>1,153,810</b>	<b>3,461,776</b>
<b>Lighting</b>					
Lighting	824,179		20.0 %	2,812,924	8,439,615
<b>Receptacle</b>					
Receptacles	49,678		1.2 %	169,550	508,700
<b>Cogeneration</b>					
Cogeneration			0.0 %	0	0
<b>Totals</b>					
<b>Totals**</b>	<b>1,607,277</b>	<b>8,617,068</b>	<b>100.0 %</b>	<b>14,102,706</b>	<b>25,529,156</b>

\* Note: Resource Utilization factors are included in the Total Source Energy value.

\*\* Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

## ENERGY CONSUMPTION SUMMARY

By CAE

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
<b>ECM #4 STAGE UNIT REPLACEMENT</b>					
<b>Primary heating</b>					
Primary heating	336,033	7,491,975	62.3 %	8,638,856	11,327,278
Other Htg Accessories	53,015		1.3 %	180,941	542,878
<b>Heating Subtotal</b>	<b>389,049</b>	<b>7,491,975</b>	<b>63.6 %</b>	<b>8,819,797</b>	<b>11,870,156</b>
<b>Primary cooling</b>					
Cooling Compressor	246,916		6.1 %	842,723	2,528,421
Tower/Cond Fans	9,995		0.3 %	34,113	102,349
Condenser Pump			0.0 %	0	0
Other Clg Accessories	932		0.0 %	3,180	9,541
<b>Cooling Subtotal....</b>	<b>257,842</b>		<b>6.4 %</b>	<b>880,016</b>	<b>2,640,311</b>
<b>Auxiliary</b>					
Supply Fans	234,806		5.8 %	801,393	2,404,420
Pumps	107,800		2.7 %	367,921	1,103,873
Stand-alone Base Utilities	4,745		0.1 %	16,195	48,589
<b>Aux Subtotal....</b>	<b>347,351</b>		<b>8.6 %</b>	<b>1,185,509</b>	<b>3,556,882</b>
<b>Lighting</b>					
Lighting	824,179		20.3 %	2,812,924	8,439,615
<b>Receptacle</b>					
Receptacles	49,678		1.2 %	169,550	508,700
<b>Cogeneration</b>					
Cogeneration			0.0 %	0	0
<b>Totals</b>					
<b>Totals**</b>	<b>1,868,099</b>	<b>7,491,975</b>	<b>100.0 %</b>	<b>13,867,795</b>	<b>27,015,664</b>

\* Note: Resource Utilization factors are included in the Total Source Energy value.

\*\* Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

## ENERGY CONSUMPTION SUMMARY

By CAE

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
<b>ECM #5 CLEAVER BROOKS BOILER REPLACEMENT</b>					
<b>Primary heating</b>					
Primary heating	361,770	6,933,496	61.4 %	8,168,216	11,002,949
Other Htg Accessories	36,829		0.9 %	125,698	377,133
<b>Heating Subtotal</b>	<b>398,599</b>	<b>6,933,496</b>	<b>62.4 %</b>	<b>8,293,915</b>	<b>11,380,082</b>
<b>Primary cooling</b>					
Cooling Compressor	276,129		7.1 %	942,427	2,827,564
Tower/Cond Fans	10,192		0.3 %	34,785	104,366
Condenser Pump			0.0 %	0	0
Other Clg Accessories	932		0.0 %	3,180	9,541
<b>Cooling Subtotal....</b>	<b>287,252</b>		<b>7.4 %</b>	<b>980,392</b>	<b>2,941,470</b>
<b>Auxiliary</b>					
Supply Fans	234,806		6.0 %	801,393	2,404,420
Pumps	66,582		1.7 %	227,243	681,799
Stand-alone Base Utilities	4,745		0.1 %	16,195	48,589
<b>Aux Subtotal....</b>	<b>306,133</b>		<b>7.9 %</b>	<b>1,044,831</b>	<b>3,134,808</b>
<b>Lighting</b>					
Lighting	824,179		21.2 %	2,812,924	8,439,615
<b>Receptacle</b>					
Receptacles	49,678		1.3 %	169,550	508,700
<b>Cogeneration</b>					
Cogeneration			0.0 %	0	0
<b>Totals</b>					
<b>Totals**</b>	<b>1,865,841</b>	<b>6,933,496</b>	<b>100.0 %</b>	<b>13,301,612</b>	<b>26,404,674</b>

\* Note: Resource Utilization factors are included in the Total Source Energy value.

\*\* Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name:  
Dataset Name: P:\PROJECTS 2009\BS09-002 SOUTH BRUNS SCHOOLS LGEA\TRACE\CROSSROADS  
SOUTH\CROSSROADSSOUTH.TRC

TRACE® 700 v6.2 calculated at 10:53 AM on 11/20/2009  
Alternative - 4 Energy Consumption Summary report page 1

## ENERGY CONSUMPTION SUMMARY

By CAE

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
<b>ECM #6 WEIL MCLAIN BOILER REPLACEMENT</b>					
<b>Primary heating</b>					
Primary heating	361,770	6,283,381	61.0 %	7,518,101	10,318,618
Other Htg Accessories	27,070		0.8 %	92,391	277,202
<b>Heating Subtotal</b>	<b>388,840</b>	<b>6,283,381</b>	<b>61.8 %</b>	<b>7,610,493</b>	<b>10,595,819</b>
<b>Primary cooling</b>					
Cooling Compressor	246,916		6.8 %	842,723	2,528,421
Tower/Cond Fans	9,995		0.3 %	34,113	102,349
Condenser Pump			0.0 %	0	0
Other Clg Accessories	932		0.0 %	3,180	9,541
<b>Cooling Subtotal....</b>	<b>257,842</b>		<b>7.1 %</b>	<b>880,016</b>	<b>2,640,311</b>
<b>Auxiliary</b>					
Supply Fans	234,806		6.5 %	801,393	2,404,420
Pumps	9,904		0.3 %	33,802	101,416
Stand-alone Base Utilities	4,745		0.1 %	16,195	48,589
<b>Aux Subtotal....</b>	<b>249,455</b>		<b>6.9 %</b>	<b>851,390</b>	<b>2,554,425</b>
<b>Lighting</b>					
Lighting	824,179		22.8 %	2,812,924	8,439,615
<b>Receptacle</b>					
Receptacles	49,678		1.4 %	169,550	508,700
<b>Cogeneration</b>					
Cogeneration			0.0 %	0	0
<b>Totals</b>					
<b>Totals**</b>	<b>1,769,995</b>	<b>6,283,381</b>	<b>100.0 %</b>	<b>12,324,372</b>	<b>24,738,870</b>

\* Note: Resource Utilization factors are included in the Total Source Energy value.

\*\* Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name:  
Dataset Name: P:\PROJECTS 2009\BS09-002 SOUTH BRUNS SCHOOLS LGEA\TRACE\CROSSROADS SOUTH\CRSOUTH-B.TRC

TRACE® 700 v6.2 calculated at 04:31 PM on 11/19/2009  
Alternative - 2 Energy Consumption Summary report page 1

**ENERGY CONSUMPTION SUMMARY**  
By CAE

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
<b>ECM #7 HIGH EFF MOTORS</b>					
<b>Primary heating</b>					
Primary heating	362,285	7,388,048	61.9 %	8,624,525	11,486,695
Other Htg Accessories	53,015		1.3 %	180,941	542,878
<b>Heating Subtotal</b>	<b>415,300</b>	<b>7,388,048</b>	<b>63.2 %</b>	<b>8,805,467</b>	<b>12,029,574</b>
<b>Primary cooling</b>					
Cooling Compressor	275,771		6.8 %	941,208	2,823,906
Tower/Cond Fans	10,175		0.3 %	34,727	104,191
Condenser Pump			0.0 %	0	0
Other Clg Accessories	932		0.0 %	3,180	9,541
<b>Cooling Subtotal....</b>	<b>286,878</b>		<b>7.0 %</b>	<b>979,115</b>	<b>2,937,638</b>
<b>Auxiliary</b>					
Supply Fans	231,067		5.7 %	788,632	2,366,134
Pumps	107,800		2.6 %	367,921	1,103,873
Stand-alone Base Utilities	4,745		0.1 %	16,195	48,589
<b>Aux Subtotal....</b>	<b>343,612</b>		<b>8.4 %</b>	<b>1,172,748</b>	<b>3,518,595</b>
<b>Lighting</b>					
Lighting	824,179		20.2 %	2,812,924	8,439,615
<b>Receptacle</b>					
Receptacles	49,678		1.2 %	169,550	508,700
<b>Cogeneration</b>					
Cogeneration			0.0 %	0	0
<b>Totals</b>					
<b>Totals**</b>	<b>1,919,647</b>	<b>7,388,048</b>	<b>100.0 %</b>	<b>13,939,803</b>	<b>27,434,122</b>

\* Note: Resource Utilization factors are included in the Total Source Energy value.

\*\* Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.