MAGNOLIA BOARD OF EDUCATION

MAGNOLIA PUBLIC SCHOOL

ENERGY ASSESSMENT

FOR
NEW JERSEY
BOARD OF PUBLIC UTILITIES

JANUARY 2013

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CHA PROJECT NO. 24895

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REPORT DISCLAIMER

This audit was conducted in accordance with the standards developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) for a Level II audit. Cost and savings calculations for a given measure were estimated to within ±20%, and are based on data obtained from the owner, data obtained during site observations, professional experience, historical data, and standard engineering practice. Cost data does not include soft costs such as engineering fees, legal fees, project management fees, financing, etc.

A thorough walkthrough of the school was performed, which included gathering nameplate information and operating parameters for all accessible equipment and lighting systems. Unless otherwise stated, model, efficiency, and capacity information included in this report were collected directly from equipment nameplates and /or from documentation provided by the owner during the site visit. Typical operation and scheduling information was obtained from interviewing staff and spot measurements taken in the field.

1.0 EXECUTIVE SUMMARY

This energy audit is performed by CHA in connection with the New Jersey Board of Public Utilities' Local Government Energy Audit Program for the Magnolia Board of Education. The purpose of this report is to convey the findings of the energy audit to identify energy savings potential associated with major energy consumers and inefficient practices. This report details the results of the energy audit conducted for:

Building Name	Address	Square Feet	Construction Date
Magnolia Public School	420 Warwick Road Magnolia, NJ 08049	62,723	1936, 1953,1996

The potential annual energy and cost savings for each energy conservation measure (ECM) is shown in below in Table 1. Each individual measure's annual savings are dependent on that measure alone, there are no interactive effects calculated. There are three options shown for Lighting ECM savings; only one option can be chosen. Incentives shown (if any) are based only on the Smart Start Incentive Program. Other NJBPU or local utility incentives may also be available/ applicable and are discussed in Section 5.0.

Each measure recommended by CHA typically has a simple payback period of 15 years or less to be consistent with the requirements of the Energy Savings Improvement Plan (ESIP) which has a maximum payback period of 15 years. Occasionally, we will recommend an ECM that has a longer payback period, based on the need to replace that piece(s) of equipment, such as a boiler for example. If the recommended measures are implemented a total potential annual savings of $ 25,300 may be realized with an average simple payback period of 25.7 years.

Table 1: Summary of Energy Conservation Measures

Summary of Energy Conservation Measures							
Energy Conservation Measure		**Approx. Costs ($)**	**Approx. Savings ($/year)**	**Payback (Years) w/o Incentive**	**Potential Incentive ($)***	**Payback (Years) w/ Incentive**	**Recommended**
ECM 1	Window Replacements and Reduced Glazing	115,000	500	>20.0	0	>20.0	
ECM 2a	Replacement of HVAC RTUs	29,000	100	>20	900	>20	
ECM 2b	Replacement of HVAC RTUs	22,000	100	>20	500	>20	
ECM 3	Boiler and Steam System Replacement	511,000	11,500	>20.0	4,000	>20.0	X
ECM 4	Replace Window A/C units w/Energy Star Units	2,000	100	20.0	0	20.0	
ECM 5	Install Premium Motors on HW Pumps	4,000	100	>20	2,800	12.0	X
ECM 6	Replace MAUs and EFs for Gymnasium / Auditorium	80,000	1,200	>20	2,000	>20	
ECM 7	Replace DWH w/ tankless instantaneous unit	4,000	200	20.0	300	18.5	
ECM 8	Lighting Replacement / Upgrades	91,000	5,000	18.2	9,000	16.4	
ECM 9	Install Lighting Controls (occupancy sensors)	30,000	4,700	6.4	3,900	5.6	
ECM 10	Lighting Replacement s with Lighting Controls	121,000	8,700	13.9	12,900	12.4	X
ECM 11	Install Low Flow Plumbing Fixtures	33,000	5,000	6.6	0	6.6	X
ECM 12	Convert Electric Dish Washer Booster Heater to NG	15,000	900	16.7	0	16.7	

2.0 INTRODUCTION AND BACKGROUND

The Magnolia Public School is a 62,723 square foot building consisting of two floors. The building was originally constructed in 1936, with a subsequent addition in 1953 and 1996. The school includes the following spaces: classrooms, offices, multi-purpose room, kitchen, storage, toilet rooms and a media center. The school hours of operation are from 8:30 AM – 3:00 PM Monday through Friday, with various after-school activities. The school is closed on weekends. The school has approximately 430 students and 71 faculty and staff members. The school has 84 computers.

Figure 1: Magnolia Public School

3.0 UTILITY

Utilities include electricity and natural gas. Electricity is supplied and delivered by Public Service Enterprise Group (PSE&G). The business administrator is currently looking into using a 3rd party electric supplier for the 2013 school year. The school has 3 electric meters. One meter serves the majority of the building except for one addition. The second meter serves the addition that the previous meter doesn't. The last meter doesn't have anything attached. Natural gas is delivered by South Jersey Gas and supplied by Woodruff Energy. Water is paid for through New Jersey American Water.

For the 12-month period ending in October 2012, the utilities usage for the building was as follows:

Table 2: Actual Cost & Site Utility Usage

Electric		
Annual Usage	491,380	kWh/year
Annual Cost	77,036	$
Blended Rate	0.157	$/kWh
Supply Rate	0.138	$/kWh
Demand Rate	4.87	$/kW
Peak Demand	139.2	kW
Min. Demand	75.2	kW
Avg. Demand	116.1	kW
Natural Gas		
Annual Usage	46,838	Therms/year
Annual Cost	46,115	$
Rate	0.985	$/Therm
Water		
Annual Usage	545	gallons/yr
Annual Cost	8,307	$
Rate	15.256	$/gallon

Electrical usage was generally higher in the summer months when window air conditioning equipment was operational. Natural gas consumption was highest in winter months for heating. See Appendix A for a detailed utility analysis.

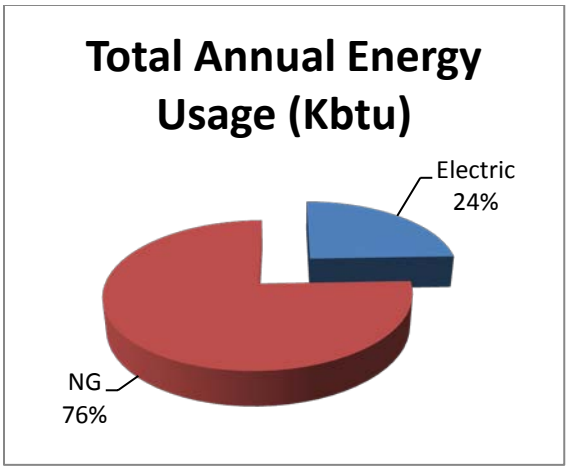


Figure 2: Annual Site Energy Usage

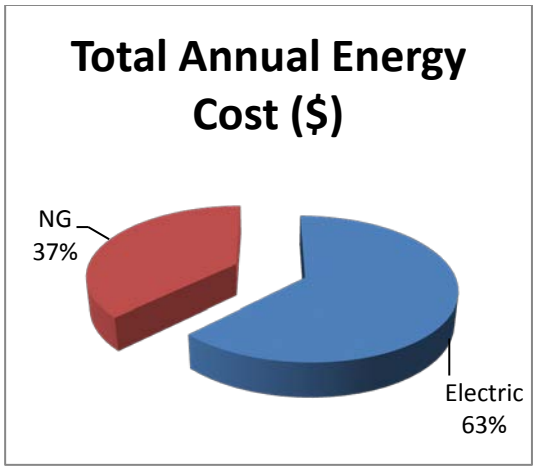


Figure 3: Annual Energy Cost

Under New Jersey's energy deregulation law, the supply portion of the electric (or natural gas) bill is separated from the delivery portion. The supply portion is open to competition so customers can shop around for the best price on their energy supplies. The electric and natural gas distribution utilities will still deliver those supplies through their wires and pipes – and respond to emergencies, should they arise – regardless of where those supplies are purchased. Purchasing energy supplies from a company other than your electric or gas utility is purely an economic decision; it has no impact on the reliability or safety of your service. Additional information on selecting a third party energy supplier is available here: http://www.state.nj.us/bpu/commercial/shopping.html. See Appendix A for a list of third-party energy suppliers licensed by the Board of Public Utilities to sell within the building's service area.

4.0 EXISTING CONDITIONS & AREAS OF ENERGY OPPORTUNITY

Energy conservation measures (ECM's) are energy savings recommendations that typically require a financial investment. Energy savings can be in the form of electrical demand (KW=kilowatts), electrical usage (Kwh=Kilowatt-hour), natural gas (Therms=100,000 BTU), propane gas (Gallons=96,500 BTU), Fuel Oil (Gallons =138,700 Btu) and water (KGAL=1000 gallons).

These recommendations are influenced by the time period that it takes to "break even "referred to as Simple Payback. Simple payback is calculated by dividing the cost of implementing the ECM by the energy cost savings (in dollars) of that ECM.

4.1 Building Envelope

The original building is built of concrete masonry units with brick veneer. The interior walls are painted block. There is currently no insulation in the walls. The other additions are constructed in similar fashion with the only difference being the 1996 addition has insulation in the walls.

Windows throughout the school building are operable aluminum framed single glazing windows. The windows seem to be in poor condition in the 1953 and 1936 portions of the building. The infiltration from these windows is significant. The windows in the 1996 addition are operable aluminum framed double pane. During the site visit it was noted in the kickoff meeting that the windows vary with age. They were installed at the time of the renovation with 1936 being the oldest. The doors were installed at the same time as the windows. They are in fair condition in the 1953 and 1936 portions of the building and good condition in the 1996.

The roof of the school is a metal decking with rubber membrane on the flat portions. The sloped portions have fiberglass shingles on the exterior. During the site visit it was noted that the roof was in fair condition.

The following energy conservation measures were identified for building envelope improvements:

4.1.1 ECM-1 Window Replacements and Reduced Glazing

The facility has 1,152 square feet of window area. These windows are constructed with aluminum frames and single pane glazing. Due to age, construction type, and condition, the windows incur excess air infiltration and provide average thermal resistance to heat transfer. An assessment considered installing aluminum frame with triple pane glazing to decrease energy losses.

The calculation uses bin hours to estimate the occupied and unoccupied bin hours. This is converted to existing energy for the occupied and unoccupied cases using the existing window U-factor and the heating and cooling temperature. The two are summed together to create the annual utility usage for the baseline. The same steps are done to calculate the proposed utility usage. The difference in heating losses through the windows resulted in annual heating.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized as follows:

ECM-1 Window Replacements and Reduced Glazing

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
115,000	0	500	500	500	0	500	(1.0)	0	>20	>20

* Incentive shown is per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities

Expected Life: 30 years

Lifetime Savings: 15,000 kWh 15,000 therms $ 15,000

This measure is not recommended.

4.2 HVAC Systems

4.2.a Heating Hot Water System

Magnolia Public School has (2) natural gas fired hot water boilers manufactured by Hydrotherm. The model number is MR-1200B. The boilers were installed in 1996 and have a heating input capacity of 1,200,000, output capacity of 960,000 MBH with a thermal efficiency to be 80%. The boilers are controlled using an OA temperature reset schedule. The boilers operate in a lead / lag fashion and maintenance personnel alternate the lead and lag boilers. These boilers serve the 1996 addition.

There is another natural gas steam boiler manufactured by H.B. Smith. The model number is 44-440 Mills and has an input of 3,350,000 btuh. It was installed in 1956 and serves the entire building except the 1996 addition. The original building is steam and consists of approximately 8 classrooms and a lunchroom.

These additions served on this boiler are hot water, which is produced by running the steam through a heat exchanger to serve the unit ventilators, unit heaters, and rooftop units. Hot water is pumped by (2) 3.0 HP that operate in lead/lag to provide heating to the original building. The 1996 addition is served by (2) 2.0 HP that also operate in lead/lag to provide heating to the original building. The classrooms are heated by unit ventilators having hot water coils. The gymnasium is heated by (2) Trane heating & ventilation (HV) unit. The Unit Ventilators and HV units were controlled by pneumatic valves, dampers and actuators. One HV unit runs at a time to condition the space.

Specifics on mechanical equipment can be found within the equipment inventory located in Appendix B.

4.2.b Direct Expansion (DX) and Split System Cooling Systems

Cooling is provided to the Media Center by a 14-ton Trane packaged electric rooftop unit. The general offices are cooled by a 7.5-ton Trane packaged rooftop unit. The hallway is conditioned with a Trane climate changer. The computer lab is conditioned with smaller residential style Mitsubishi DX split system. The blower is in the space and the condensing unit is placed on the roof. Eight (8) spaces in the building have window A/C units that provide cooling on hot days to classrooms with special needs. These units are controlled by the personnel. There is no cooling in the cafeteria or gymnasium.

Specifics on mechanical equipment can be found within the equipment inventory located in Appendix B.

The following ECMs were identified as HVAC system improvements:

4.2.1 ECM-2 Replacement of HVAC RTUs

The HVAC roof top units (RTUs) contain electric DX cooling. Each RTU is mounted on an extended curb, with gravity pressure relief dampers and full economizer dampers. Supply and return ductwork is routed down through the roof curbs to a duct distribution system above the ceilings to each space. The roof tops vary in age but most are over ten years old and several are past their useful life. It is recommended that the RTUs be replaced through attrition with higher energy efficiency ratio (EER) models. This ECM assesses the replacement of each size of RTU and gives the resulting energy savings. The total energy savings is the sum of all of the rooftop unit replacements.

The assumption of this calculation is that the operating hours, number of units, and capacity stays the same. The energy savings result from operating higher efficiency units than the existing.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-2a Replacement of HVAC RTUs (14-ton)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
29,000	0	700	0	100	0	100	(0.9)	900	>20	>20

* Incentive shown is per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities

Expected Life: 25 years

Lifetime Savings: 17,500 kWh 0 therms $ 2,500

ECM-2b Replacement of HVAC RTUs (7-ton)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
22,000	0	600	0	100	0	100	(0.9)	500	>20	>20

* Incentive shown is per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities

Expected Life: 25 years

Lifetime Savings: 15,000 kWh 0 therms $ 2,500

4.2.2 ECM-3 Boiler and Steam System Replacement

The 1936 portion of the building has one (1) H.B. Smith, 44-440 Mills steam boiler. This boiler serves the entire building except for the 1996 addition, which is served by dedicated hot water boilers. These steam boilers provide steam directly to various terminal units such as unit ventilators and also to a steam to hot water heat exchanger that produces heating hot water that serves terminal units in other parts of the building. The steam boiler efficiency is estimated to be 75% due to age of boilers and the added inefficiency of the heat exchanger needed to produce hot water. This ECM would involve replacing the existing boilers with two (2) 2,000 MBH condensing boilers and converting the steam system to hot water. Condensing boilers operate at higher efficiencies when producing lower water temperatures, typically in the 92-96% range. The increased system efficiency will result in lower natural gas usage. The proposed boiler replacement will involve piping and wiring modifications as well as new venting and combustion air ducting.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-3 Boiler and Steam System Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
511,000	0	0	11,700	11,500	0	11,500	(0.4)	4000	>20	>20

* Incentive shown is per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities

Expected Life: 25 years

Lifetime Savings: 0 kWh 65,000 therms $ 57,500

This measure is recommended due to age of boilers.

4.2.3 ECM-4 Replace Window A/C units w/Energy Star Units

The school has 8, 12,000 BTU/H window mounted A/C units. This measure assessed replacing the window A/C units with new Energy Star window A/C units installed by the maintenance staff.

The assumption of this calculation is that the operating hours and capacity stay the same. The energy saving results from operating a higher efficiency unit.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-4 Replace Window A/C units w/Energy Star Units

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
2,000	0	400	0	100	0	100	(0.6)	0	20.0	20.0

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

Expected Life: 12 years

Lifetime Savings: 4,800 kWh 0 therms $ 1,200

This measure is not recommended.

4.2.4 ECM-5 Install Premium Motors on Hot water Pumps

Hot water is pumped by (2) 3.0 HP that operate in lead/lag to provide heating to the original building. These pumps are constant volume with 86.5% efficient motors. The 1996 addition is served by (2) 2.0 HP that also operate in lead/lag to provide heating to the original building. These pumps are constant volume with 81.5% efficient motors. The hot water system pumps operate at a constant speed (constant water flows). By adding premium efficiency motors with an estimated efficiency of 87.1% for the 2 HP and 88.2% for the 3.0 HP pumps, significant electrical energy can be saved.

The calculation uses electrical nameplate data (HP) from the motor, efficiency and the runtime hours to estimate the annual electrical usage in kWh. The proposed annual electrical usage in kWh is calculated from converting the electrical nameplate data (HP) from the motor to kW using the efficiency multiplied by the runtime hours. The difference between the two values is the energy savings.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-5 Install Premium Motors on Hot water Pumps

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
4,000	0	500	0	100	0	100	(0.7)	2,800	>20	12.0

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

Expected Life: 15 years

Lifetime Savings: 7,500 kWh 0 therms $ 1,500

This measure is recommended.

4.2.5 ECM-6 Replace MAUs and EFs for Gymnasium / Auditorium

The gymnasium / auditorium have dedicated make up air units (MAUs) that supply treated air into the space. These units are interlocked with exhaust fans (EFs) to remove air from the space. The system is designed to provide ventilation air based on maximum occupancy, which occurs infrequently. By reducing the outside quantity air during lightly occupied time periods heating energy will be saved. Carbon dioxide (CO2) sensors could be installed to control quantity of ventilation air based on maintaining an acceptable CO_2 level in the space as an indicator of indoor air quality. A limit of 1000 PPM of CO_2 is recommended in ASHRAE Standard 62-2010, Ventilation for Acceptable Indoor Air Quality. Sensors will be installed to measure the building air CO_2 concentration, and the new control sequence of operation programmed into the BAS. During unoccupied periods, the outside air dampers should be closed. This ECM assesses removing the (2) MAUs and (2) EFs and replacing with (2) Heating & Ventilation Units equipped with Demand Ventilation Controls.

Bin weather data was utilized to obtain the annual operating hours required to maintain the current setpoint of 70°F. The BTU/Hr rating is calculated from the OA conditions and CFM. It is assumed that installing the controls will reduce the amount of OA to be conditioned by 20%. The energy saving is the difference in natural gas usage.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-6 Replace MAUs and EFs for Gymnasium / Auditorium

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
80,000	0	0	1,200	1,200	0	1,200	(0.8)	0	>20	>20

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

Expected Life: 15 years

Lifetime Savings: 0 kWh 18,000 therms $ 18,000

This measure is not recommended.

4.3 Control Systems

.The building control systems consists of an outdated and inefficient pneumatic temperature control system. The hydronic heating system including the classroom unit ventilators and the steam boiler utilize pneumatic control valves and damper actuators. Three air compressors provide the day/ night air pressure needed to operate the valves and dampers. . The rooftop units are controlled with stand-alone electric programmable thermostats.

Typical setpoints in the school are 68°F heating during occupied times, and 58°F heating during unoccupied times. The majority of the school is not cooled. The few window air conditioning units that are used are manually controlled by teachers in those classrooms.

There are no ECMs associated with the school's HVAC control system.

4.4 Domestic Hot Water System

Magnolia Public School has two domestic water heaters. One large domestic hot water heater located in the 1996 addition mechanical room (MER 2) and a small one located in the janitor room. The larger water heater is a Bradford White (EF100T199E3N2) natural gas fired commercial domestic hot water heater with a capacity of 100 gallons with 80% efficiency and an input of 199,999 BTU. This water heater is in fair condition. The domestic hot water heater serves the kitchen, toilet rooms and sinks located throughout the school. The small one is a 30 gallon electric water heater. It is in fair condition. This heater serves the bathrooms in the wing over by the Superintendent's office, the conference room and the teachers' lounge located above that wing.

The following ECM identifies an improvement to the school's Domestic Hot Water System:

4.4.1 ECM-6 Replace Domestic Hot Water Heater with Instantaneous unit

The school utilizes a 100 gallon, 199,999 BTU Bradford White EF100T199E3N2 domestic hot water heater (DWH). The DHW is 80% efficiency and is past it useful life according to ASHRAE. This ECM assesses replacing this DWH with a more efficient tankless type domestic water heater sized to meet the DHW requirements of the building.

According to the U.S. Department of Energy, 2.5% of stored capacity is lost every hour during DHW heater standby. This value was applied to the total volume to determine annual standby losses. Proposed efficiency was based on a typical high efficiency natural gas condensing type hot water heater. The new water heater will require water and gas piping modifications, venting, and electrical connections.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-7 Replace Domestic Hot Water Heater w/ Instantaneous unit

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
4,000	0	0	200	200	0	200	(0.4)	300	20.0	18.5

* Incentive shown is per the New Jersey SmartStart Install Program. See section 5.0 for other incentive opportunities.

Expected Life: 12 years

Lifetime Savings: 0 kWh 2,400 therms $ 2,400

This measure is not recommended.

4.5 Lighting/Electrical Systems

The majority of the lighting in the school is compact florescent lighting (CFLs) with electronic ballasts and incandescent lamps. The school utilizes 34 watt T-8 fluorescent tube fixtures for offices, multipurpose room, hallways, and classrooms and 23 W or compact fluorescent spiral bulbs or 100 W incandescent bulbs for storage closets. There are a few T-12 bulbs in the mechanical rooms and maintenance office and various restrooms. The building exterior utilizes a 400W metal halide wall packs that are controlled by a timer.

Magnolia Public School utilizes 84 computers throughout the building in classrooms, offices, media centers and computer labs. All of the computers have flat screen LCD monitors.

The following ECMs identified are improvements to Magnolia Public School's lighting and electrical system:

4.5.1 ECM-8 Lighting Replacement / Upgrades

The majority of the lighting in the school is compact florescent lighting (CFLs) with electronic ballasts and incandescent lamps. The school utilizes 34 watt T-8 fluorescent tube fixtures for offices, multipurpose room, hallways, and classrooms and 23 W or compact fluorescent spiral bulbs or 100 W incandescent bulbs for storage closets. There are a few T-12 bulbs in the mechanical rooms and maintenance office and various restrooms.

Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to estimated times of operation. The difference between energy requirements resulted in a total annual savings of 27,500 kWh with an electrical demand reduction of about 11.9 kW. These calculations are based upon 1 to 1 replacements with the fixtures. They do not take into account lumen output and square footage. A more comprehensive study may be performed to determine correct lighting levels.
Supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture, are provided in Appendix C.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-8 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
91,000	11.9	27,500	0	5,000	0	5,000	(0.2)	9,000	18.2	16.4

* Incentive shown is per the New Jersey SmartStart Install Program. See section 5.0 for other incentive opportunities.

Expected Life: 15 years

Lifetime 412,500 kWh 0 therms $ 75,000

Savings: _____ _____ _____

This measure is not recommended in lieu of ECM-10.

4.5.2 ECM-9 Install Lighting Controls (Occupancy Sensors)

Review of the comprehensive lighting survey determined that lighting in classrooms and various other spaces are typically operational, regardless of occupancy. Therefore, installing an occupancy sensor in these spaces to turn off lights when the areas are unoccupied was assessed.

This measure recommends installing occupancy sensors for the current lighting system. Using a process similar to that utilized in section 4.5.1, the energy savings for this measure was calculated by applying the known fixture wattages in the space to the estimated existing and proposed times of operation for each fixture. The difference between the two values resulted in an annual savings of 30,200 kWh.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-9 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
30,000	0.0	30,200	0	4,700	0	4,700	1.4	3,900	6.4	5.6

* Incentive shown is per the New Jersey SmartStart Install Program. See section 5.0 for other incentive opportunities.

Expected Life: 15 years

Lifetime Savings: 453,000 kWh 0 therms $70,500

This measure is not recommended in lieu of ECM-10.

4.5.3 ECM-10 Lighting Replacements with Controls (Occupancy Sensors)

This measure is a combination of ECM-8 and ECM-9; recommending replace/upgrade the current lighting fixtures to more efficient ones and installing occupancy sensors on the new lights. Interactive effects of the higher efficiency lights and occupancy sensors lead the energy and cost savings for this measure to not be cumulative or equivalent to the sum of replacing the lighting fixtures alone and installing occupancy sensors without the lighting upgrade. The calculated annual savings is 51,300 kWh with a demand reduction of 11.9 kW at a total of $8,700.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-10 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
121,000	11.9	51,300	0	8,700	0	8,700	0.1	12,900	13.9	12.4

* Incentive shown is per the New Jersey SmartStart Install Program. See section 5.0 for other incentive opportunities.

Expected Life: 15 years

Lifetime Savings: 769,500 kWh 0 therms $130,500

This measure is recommended.

4.6 Plumbing Systems

Faucets, toilets and urinals installed before the 90s consume more water than modern plumbing fixtures. On average faucets installed before the 90s have a flow rate of 3 gallons per minute (gpm), urinals consume approximately 3 gallons per flush (gpf) and toilets typically use 5.5 gpf. The plumbing fixtures in the 1996 building are a mix of older high flow fixtures and some newer low flow fixtures. The newer fixtures appear to be in good condition, the older fixtures should be considered for replacement. More water-efficient flush valves and faucets could be installed to further reduce water usage.

There aren't any showers in the school and the faucets have push buttons.

The following ECM identifies an improvement to the school's Plumbing System:

4.6.1 ECM-11 Install Low Flow Plumbing Fixtures

The facility has a mixture of older and newer style fixtures in the restrooms. The older style fixtures consume more water than modern plumbing fixtures. It was determined that there is a combination of 37 toilets and 17 urinals with an average water use of 3.5 gal/flush. Per the number of occupants, it was estimated that each toilet and faucet is utilized approximately nine times per day.

The water savings associated from replacing these fixtures with low-flow fixtures was calculated by taking the difference of the annual water usage for the proposed and base case. The basis of this calculation is the number of times each fixture is used, gallons per use, and number of fixtures. Replacing the existing fixtures in the restrooms with 1.28 kGals/flush toilets would save 300 KGal annually.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-11 Install Low Flow Plumbing Fixtures

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Water	Total						
$	kW	kWh	kgals	$	$	$		$	Years	Years
33,000	0.0	0	300	5,000	0	5,000	1.2	0	6.6	6.6

* Does not qualify for an Incentive per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

Expected Life: 15 years

Lifetime Savings: 0 kWh 4,500 kgals $75,000

This measure is recommended.

4.7 Kitchen Equipment

Cooking equipment for the kitchen within the school runs partly on electricity and partly on natural gas. This includes the exhaust hoods, stove, oven, dishwasher, and dishwasher booster heater.

The following ECMs identified are improvements to Magnolia Public School's kitchen equipment:

4.7.1 ECM-12 Convert Electric Dish Washer Booster Heater to Natural Gas

The school uses a 12.0 kW electric heater for drying dishes. This heater is used for four hours per day for 180 days per year. Utilizing natural gas for the heater was assessed.

The calculation uses electrical consumption and annual electrical cost as the baseline, which was converted to natural gas for the proposed case. The difference between the two values is the energy savings.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-12 Convert Electric Dish Washer Booster Heater to Natural Gas

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive *	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
15,000	36.0	6,000	(300)	900	0	900	1.6	0	16.7	16.7

* Does not qualify for an Incentive per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

Expected Life: 12 years

Lifetime Savings: 60,000 kWh (3,000) therms $ 9,000

This measure is not recommended.

5.0 PROJECT INCENTIVES

5.1 Incentives Overview

5.1.1 New Jersey Smart Start Program

For this energy audit, The New Jersey Smart Start Incentives are used in the energy savings calculations, where applicable. This program is intended for medium and large energy users and provides incentives for:

- Electric Chillers
- Gas Chillers
- Gas Heating
- Unitary HVAC
- Ground Source Heat Pumps
- Variable frequency Drives/ motors
- Refrigeration
- Prescriptive and performance lighting and lighting controls

The equipment is procured using a typical bid- build method, installed and paid for and then the incentives are reimbursed to the school.

If the School District wishes to and is eligible to participate in the Energy Savings Improvement Plan (ESIP) program and/or the Pay for Performance Incentive Program (P4P), It cannot participate in either the Smart Start or Direct Install Programs. Refer to appendix D for more information on the Smart Start program.

5.1.2 Direct Install Program

The Direct Install Program applies to smaller facilities that have a peak electrical demand of 150 kW or less in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric utility companies.

Direct Install is funded through New Jersey's Clean Energy Program and is designed to provide capital for building energy upgrade projects to fast track implementation. The program will pay up to 70% of the costs for lighting, HVAC, motors, refrigeration, and other equipment upgrades with higher efficiency alternatives. If a building is eligible for this funding, the Direct Install Program can reduce the implementation cost of energy conservation projects.

The Direct install programs has specific HVAC equipment and lighting requirements and are generally applicable only to smaller package HVAC units, small boilers and lighting retrofits.

The program pays a maximum amount of $75,000 per building, and up to $250,000 per customer per year. Installations must be completed by an approved Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this

energy audit. The incentive is reimbursed to the school upon successful replacement and payment of the equipment.

This school is eligible to receive funding from the Direct Install Program because the electrical demand is less than the maximum peak electrical demand of 150 kW in the last 12 month period.

Refer to appendix D for more information on this program.

5.1.3 Public Service Electric and Gas (PSE&G) Direct Install Program

The Public Service Electric and Gas (PSE&G) Direct Install Program targets government and non-profit customer facilities where the peak electrical demand does not exceed 150 kW in any of the previous 12 months. All elementary and secondary schools are considered regardless of size and rate class. Customers must be a PSE&G customer of record with separately metered PSE&G electric or gas account.

Direct Install is funded through PSE&G and is designed to provide capital for building energy upgrade projects to fast track implementation. The program will pay up to 80% of the costs for lighting retrofits including sensors and controls, refrigeration, motors, HVAC and site-specific custom projects. PSE&G makes the investment in energy efficiency upgrades easy for the client by initially covering 100% of the cost to install the recommended energy efficiency measures. The client will repay the remaining 20% of the total cost to install the energy efficiency measures, interest free, over the next two years on your PSE&G bill or one lump sum payment depending on the clients preference. If a building is eligible for this funding, the PSE&G Direct Install Program can significantly reduce the implementation cost of energy conservation projects.

Installations must be completed by a PSE&G Direct Install participating contractor which is assigned by the PSE&G project manager. More information regarding the program can be found on PSE&G's website at:
http://www.pseg.com/business/small_large_business/save_energy/gov_efficiency.jsp.
Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document once the cost proposal is approved.

This program is applicable to the school based on the program requirements.

5.1.4 New Jersey Pay For Performance Program (P4P)

The facility will be eligible for incentives from the New Jersey Office of Clean Energy. The most significant incentives are available from the New Jersey Pay for Performance (P4P) Program. The P4P program is designed for qualified energy conservation projects applied to facilities whose demand in any of the preceding 12 months exceeds 100 kW. This average minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations, however. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). If the participant is a municipal electric company customer, and a customer

of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. Available incentives are as follows:

Incentive #1: Energy Reduction Plan – This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP).

- Incentive Amount: $0.10/SF
- Minimum incentive: $5,000
- Maximum Incentive: $50,000 or 50% of Facility annual energy cost

The standard incentive pays $0.10 per square foot, up to a maximum of $50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an initial 75% incentive toward performance of the energy audit, facilities are only eligible for an additional $0.05 per square foot, up to a maximum of $25,000, rather than the standard incentive noted above.

Incentive #2: Installation of Recommended Measures – This incentive is based on projected energy savings as determined in Incentive #1 (Minimum 15% savings must be achieved), and is paid upon successful installation of recommended measures.

Electric

- Base incentive based on 15% savings: $0.09/ per projected kWh saved.
- For each % over 15% add: $0.005 per projected kWh saved.
- Maximum incentive: $0.11/ kWh per projected kWh saved

Gas

- Base incentive based on 15% savings: $0.90/ per projected Therm saved.
- For each % over 15% add: $0.05 per projected Therm saved.
- Maximum incentive: $1.25 per projected Therm saved

Incentive cap: 25% of total project cost

Incentive #3: Post-Construction Benchmarking Report – This incentive is paid after acceptance of a report proving energy savings over one year utilizing the Environmental Protection Agency (EPA) Portfolio Manager benchmarking tool.

Electric

- Base incentive based on 15% savings: $0.09/ per projected kWh saved.
- For each % over 15% add: $0.005 per projected kWh saved.
- Maximum incentive: $0.11/ kWh per projected kWh saved

Gas

- Base incentive based on 15% savings: $0.90/ per projected Therm saved.
- For each % over 15% add: $0.05 per projected Therm saved.
- Maximum incentive: $1.25 per projected Therm saved

Combining incentives #2 and #3 will provide a total of $0.18/ kWh and $1.8/therm not to exceed 50% of total project cost. Additional incentives for #2 and #3 are increased by $0.005/kWh and $0.05/therm for each percentage increase above the 15% minimum target to 20%, calculated with the EPA Portfolio Manager benchmarking tool, not to exceed 50% of total project cost.

Total P4P incentives are summarized below:

	Incentives $		
	Electric	**Gas**	**Total**
Incentive #1	$0	$0	$6,272
Incentive #2	$6,551	$16,661	$23,211
Incentive #3	$6,551	$16,661	$23,211
Total	**$13,102**	**$33,321**	**$52,695**

The current ECM's meet the minimum savings requirement of 15% for the Pay for Performance Program and therefore the building would be eligible for incentives #2 and #3. See Appendix D for additional details.

5.1.5 Energy Savings Improvement Plan (ESIP)

The Energy Savings Improvement Program (ESIP) allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. Under the recently enacted Chapter 4 of the Laws of 2009 (the law), the ESIP provides all government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.

ESIP allows local units to use "energy savings obligations" to pay for the capital costs of energy improvements to their facilities. This can be done over a maximum term of 15 years. Energy savings obligations are not considered "new general obligation debt" of a local unit and do not count against debt limits or require voter approval. They may be issued as refunding bonds or leases. Savings generated from the installation of energy conservation measures pay the principal of and interest on the bonds; for that reason, the debt service created by the ESOs is not paid from the debt service fund, but is paid from the general fund.

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. Pursuing a Local Government Energy Audit through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach. The "Local Finance Notice" outlines how local governments can develop and implement an ESIP for their facilities. The ESIP can be prepared internally if the entity has qualified staff. If not, the ESIP must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs. Refer to appendix D for more information on this program.

6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

6.1 Solar

6.1.1 Photovoltaic Rooftop Solar Power Generation

The facility was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The building's roof has sufficient room to install a large solar cell array. However, there is not sufficient room to size a system to meet the demand of the building. For this analysis we will consider an 80.0 KW system to help reduce usage.

The PVWATTS solar power generation model was utilized to calculate PV power generation; this model is provided in Appendix P.

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey solar renewable energy certificates program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. The cost of the ACP penalty for 2011 is $600; this is the amount that must be paid per SREC by the high emission producers. The expected dollar amount that will be paid to the PV producer for 2012 is expected to be $55/SREC credit. Payments that will be received from the PV producer will change from year to year dependent upon supply and demand. Renewable Energy Consultants is a third party SREC broker that has been approved by the New Jersey Clean Energy Program. As stated above there is no definitive way to calculate an exact price that will be received by the PV producer per SREC over the next 15 years. Renewable Energy Consultants estimated an average of $80/ SREC per year and this number was utilized in the cash flow for this report.

The existing load justifies the use of 80.0 kW PV solar array; where incentives can be applied from a New Jersey SREC program. The system costs for PV installations were derived from contractor budgetary pricing in the state of New Jersey for estimates of total cost of system installation. It should be noted that the cost of installation is currently about $4.00 per watt or $4,000 per kW of installed system, for an 80.0 kW system. Other cost considerations will also need to be considered. PV panels have an approximate 20 year life span; however, the inverter device that converts DC electricity to AC has a life span of 10 to 12 years and will need to be replaced multiple times during the useful life of the PV system.

The implementation cost and savings related to this ECM are presented in Appendix E and summarized as follows:

Photovoltaic (PV) Rooftop Solar Power Generation – 80.0 kW System

Budgetary Cost	Annual Utility Savings				Total Savings	New Jersey Renewable Energy Incentive*	New Jersey Renewable SREC**	Payback (without incentive)	Payback (with incentives)
	Electricity		Natural Gas	Total					
$	kW	kWh	Therms	$	$	$	$	Years	Years
320,000	80.0	102,222	0	16,662	16,662	0	8,178	19.2	12.9

** Estimated Solar Renewable Energy Certificate Program (SREC) at $55/1000 kWh

This measure is not recommended due to the long payback time. It is suggested, however, that the market for SREC credits is closely monitored. This market is fluctuating, and if the value per SREC is increased the measure could potentially show for a shorter payback in the near future.

6.1.2 Solar Thermal Hot Water Plant

Active solar thermal systems use solar collectors to gather the sun's energy to heat water, another fluid, or air. An absorber in the collector converts the sun's energy into heat. The heat is then transferred by circulating water, antifreeze, or sometimes air to another location for immediate use or storage for later utilization. Applications for active solar thermal energy include providing hot water, heating swimming pools, space heating, and preheating air in residential and commercial buildings.

A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. Systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually placed on the roof of the building, oriented south, and tilted around the site's latitude, to maximize the amount of radiation collected on a yearly basis.

Several options exist for using active solar thermal systems for space heating. The most common method involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system). The most practical system would transfer the heat from the panels to thermal storage tanks and transfer solar produced thermal energy to use for domestic hot water production. DHW is presently produced by gas-fired water heaters and, therefore, this measure would offer natural gas utility savings.

6.2 Demand Response Curtailment

Presently, Electricity is delivered by Public Service Electric and Gas (PSE&G), which receives the electricity from regional power grid RFC. PSE&G is the regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia including the State of New Jersey.

Utility Curtailment is an agreement with the utility provider's regional transmission organization and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an

emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and utility provider offers incentives to the CSP to participate in this program. Enrolling in the program will require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. Part of the program also will require that program participants reduce their required load or run emergency generators with notice to test the system.

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From July 2011 through October 2012 the facility had a peak electricity demand of 139.2 kW and a minimum of 75.2 kW. The monthly average over the observed 12 month period was 116.1 kW.

This measure is not recommended.

7.0 EPA PORTFOLIO MANAGER

The EPA Portfolio Manager benchmarking tool was used to assess the building's energy performance. Portfolio Manager provides a site and source Energy Use Intensity (EUI), as well as an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft^2/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100, with 100 being the most efficient. In order for a building to receive and Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed measures, the Energy Star rating will increase.

The site EUI is the amount of heat and electricity consumed by a building as reflected in utility bills. Site energy may be delivered to a facility in the form of primary energy, which is raw fuel burned to create heat or electricity, such as natural gas or oil; or as secondary energy, which is the product created from a raw fuel such as electricity or district steam. To provide an equitable comparison for different buildings with varying proportions of primary and secondary energy consumption, Portfolio Manager uses the convention of source EUIs. The source energy also accounts for losses incurred in production, storage, transmission, and delivery of energy to the site, which provide an equivalent measure for various types of buildings with differing energy sources. The results of the Portfolio Manager benchmarking tool are contained in the table below.

Building	Site EUI kBtu/ft^2/yr	Source EUI Btu/ft^2/yr	Energy Star Rating (1-100)
Magnolia Public School	77	127	41

The Magnolia Public School has an above average site EUI and therefore a below average Energy Star Rating Score of 41 (50 being the median score). This is most likely attributed to the poor windows and antiquated boilers. By implementing the measures discussed in this report, it is expected that the EUI can be reduced and the Energy Star Rating increased.

The Portfolio Manager account can be accessed by entering the username and password shown below at the login screen of the Portfolio Manager website (https://www.energystar.gov/istar/pmpam/).
Username: [redacted]
Password: [redacted]

A full EPA Energy Star Portfolio Manager Report is located in Appendix G.

The user name and password for the building's EPA Portfolio Manager Account has been provided to Ralph Johnson, Principal.

8.0 CONCLUSIONS & RECOMMENDATIONS

The LGEA energy audit conducted by CHA at the Magnolia Public School identified potential annual savings of $25,300 may be realized for the recommended ECMs, with a summary of the costs, savings, and paybacks as follows:

Summary of Energy Conservation Measures							
Energy Conservation Measure		**Approx. Costs ($)**	**Approx. Savings ($/year)**	**Payback (Years) w/o Incentive**	**Potential Incentive ($)***	**Payback (Years) w/ Incentive**	**Recommended**
ECM 3	Boiler and Steam System Replacement	511,000	11,500	>20.0	4,000	>20.0	X
ECM 5	Install Premium Motors on HW Pumps	4,000	100	>20	2,800	12.0	X
ECM 9	Lighting Replacement s with Lighting Controls	121,000	8,700	13.9	12,900	12.4	X
ECM 10	Install Low Flow Plumbing Fixtures	33,000	5,000	6.6	0	6.6	X

APPENDIX A

Utility Usage Analysis

Magnolia Board of Education
420 Warwick Road Magnolia, NJ 08049

Annual Utilities

12-month Summary

Electric		
Annual Usage	491,380	kWh/yr
Annual Cost	77,036	$
Blended Rate	0.157	$/kWh
Consumption Rate	0.138	$/kWh
Demand Rate	4.87	$/kW
Peak Demand	139.2	kW
Min. Demand	75.2	kW
Avg. Demand	116.1	kW
Gas		
Annual Usage	46,838	therms/yr
Annual Cost	46,115	$
Rate	0.985	$/therm
Water		
Annual Usage	545	gallons/yr
Annual Cost	8,307	$
Rate	15.256	$/gallon

Magnolia Board of Education
420 Warwick Road Magnolia, NJ 08049

Utility Bills: Account Numbers

Account Number	School Building	Location	Type	Notes
20343000103	Magnolia School	420 Warwick Road Magnolia, NJ 08049	Gas	
6535613208	Magnolia School	420 Warwick Road Magnolia, NJ 08049	Electric	
6728486801	Magnolia School	420 Warwick Road Magnolia, NJ 08049	Electric	
6662954608	Magnolia School	420 Warwick Road Magnolia, NJ 08049	Electric	
Combined	Magnolia School	420 Warwick Road Magnolia, NJ 08049	Water	

Magnolia Board of Education
420 Warwick Road Magnolia, NJ 08049

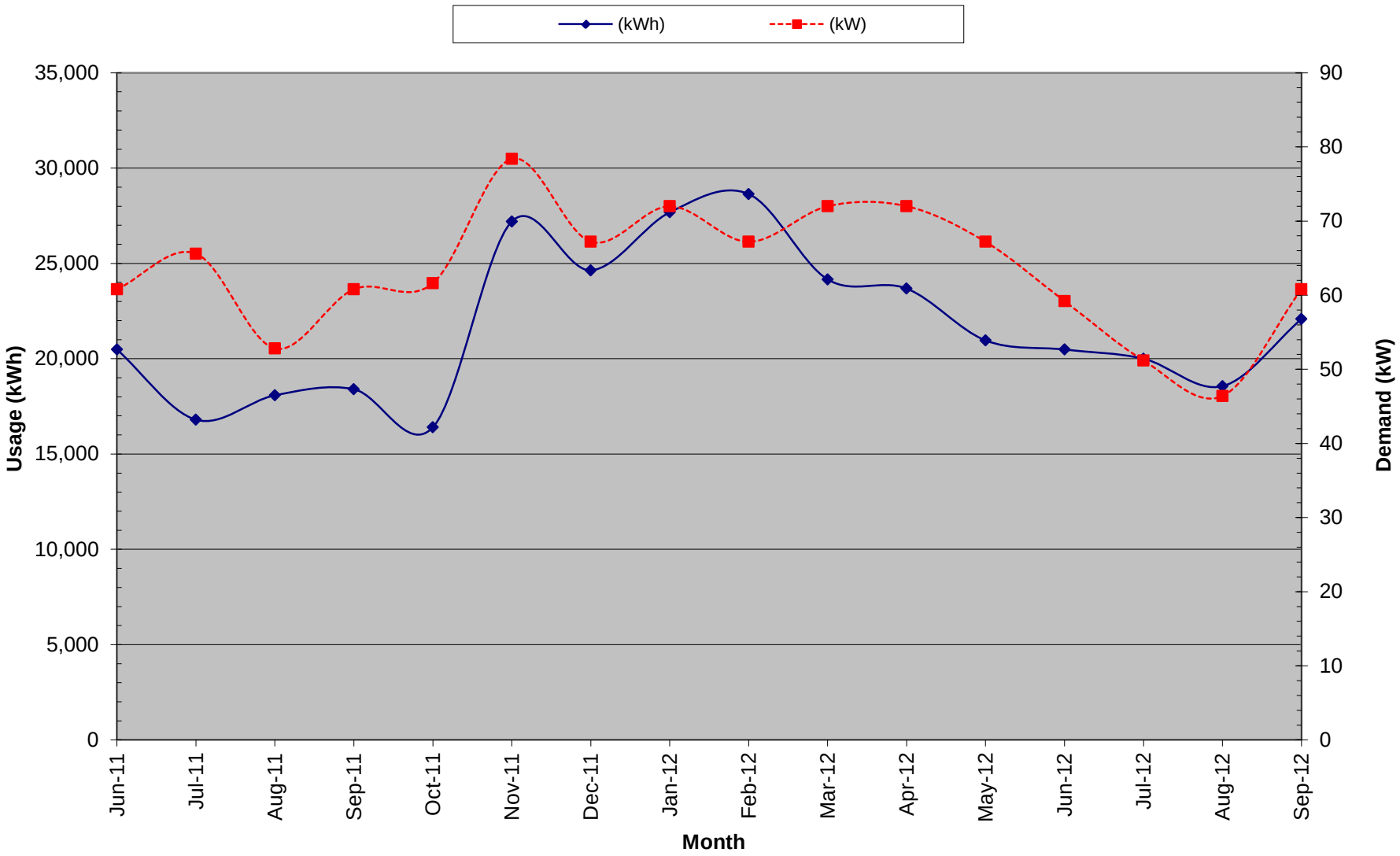
For Service at: **Magnolia School**
Account No.: **6535613208** **Delivery -** Public Service Electric & Gas
Meter No.: **9193042** **Supplier -** Public Service Electric & Gas
Electric Service

* averaged values

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Delivery ($)	Supplier ($)	Total ($)	Consumption ($)	Demand ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
June-11	20,480	60.80	1,489.00	2,215.28	3,704.28	2,981.87	722.41	0.18	0.15	11.88
July-11	16,800	65.60	1,412.84	1,981.56	3,394.40	2,613.05	781.35	0.20	0.16	11.91
August-11	18,080	52.80	1,322.80	2,174.05	3,496.85	2,858.01	638.84	0.19	0.16	12.10
September-11	18,400	60.80	1,431.62	2,109.29	3,540.91	2,805.28	735.63	0.19	0.15	12.10
October-11	16,400	61.60	775.97	1,696.30	2,472.27	2,211.30	260.97	0.15	0.13	4.24
November-11	27,200	78.40	1,195.65	2,592.77	3,788.42	3,456.28	332.14	0.14	0.13	4.24
December-11	24,640	67.20	1,069.25	2,389.29	3,458.54	3,173.85	284.69	0.14	0.13	4.24
January-12	27,680	72.00	1,195.42	2,755.17	3,950.59	3,645.56	305.03	0.14	0.13	4.24
February-12	28,640	67.20	1,207.32	2,953.64	4,160.96	3,876.27	284.69	0.15	0.14	4.24
March-12	24,160	72.00	1,084.03	2,392.59	3,476.62	3,171.59	305.03	0.14	0.13	4.24
April-12	23,680	72.00	1,068.64	2,351.54	3,420.18	3,115.15	305.03	0.14	0.13	4.24
May-12	20,960	67.20	961.09	2,129.71	3,090.80	2,806.11	284.69	0.15	0.13	4.24
June-12	20,480	59.20	1,193.01	2,056.80	3,249.80	2,797.72	452.09	0.16	0.14	7.64
July-12	20,000	51.20	1,424.92	1,983.88	3,408.80	2,789.32	619.48	0.17	0.14	12.10
August-12	18,560	46.40	1,310.11	1,838.10	3,148.21	2,586.81	561.40	0.17	0.14	12.10
September-12	22,080	60.80	1,625.75	2,071.54	3,697.29	2,961.66	735.63	0.17	0.13	12.10
October-12	24,640	69.60	1,410.70	2,332.16	3,742.86	3,208.97	533.89	0.15	0.13	7.67
Total (All)	**348,240**	**78.40**	**$19,767.42**	**$35,691.51**	**$59,201.78**	**$51,058.80**	**$8,142.98**	**$0.170**	**$0.147**	**$8.02**
Total (last 12-months)	**348,240**	**78.40**	**$19,767.42**	**$35,691.51**	**$59,201.78**	**$51,058.80**	**$8,142.98**	**$0.170**	**$0.147**	**$8.02**
Notes	1	2	3	4	5	6	7	8	9	10

1.) Number of kWh of electric energy used per month
2.) Number of kW of power measured
3.) Electric charges from Delivery provider
4.) Electric charges from Supply provider
5.) Total charges (Delivery + Supplier)
6.) Charges based on the number of kWh of electric energy used
7.) Charges based on the number of kW of power measured
8.) Total Charges ($) / Consumption (kWh)
9.) Consumption Charges ($) / Consumption (kWh)
10.) Demand Charges ($) / Demand (kW)

Electric Usage - Magnolia School - 6535613208



Utility Data -Magnolia
Electric Graph-1

Magnolia Board of Education
420 Warwick Road Magnolia, NJ 08049

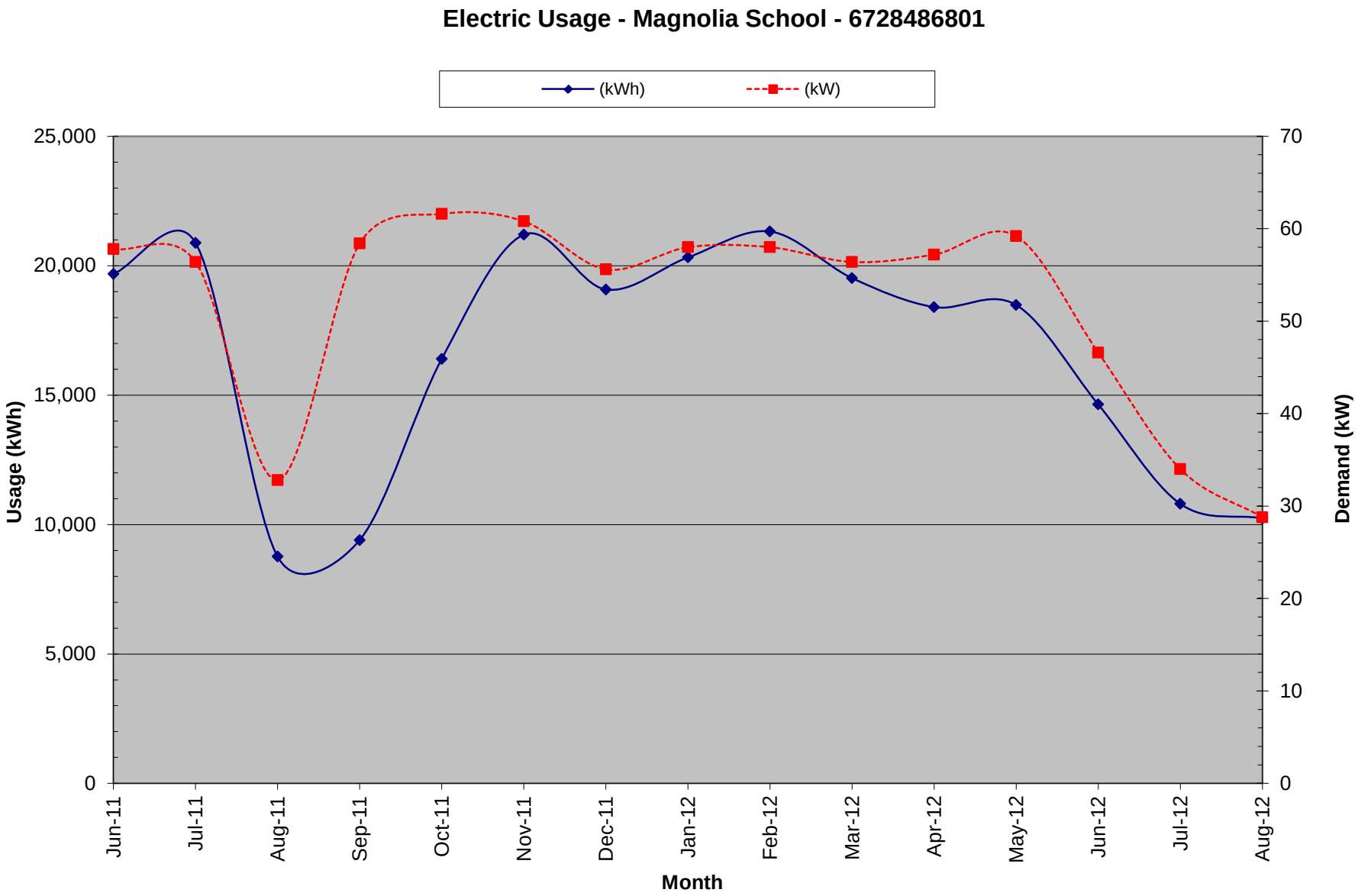
For Service at: **Magnolia School**
Account No.: **6728486801**
Meter No.: **9193041**
Electric Service

Delivery - Public Service Electric & Gas
Supplier - Public Service Electric & Gas

* averaged values

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Delivery ($)	Supplier ($)	Total ($)	Consumption ($)	Demand ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
June-11	19,680	57.80	1,151.64	2,067.19	3,218.83	2,757.54	461.29	0.16	0.14	7.98
July-11	20,880	56.40	1,455.60	2,274.65	3,730.25	3,058.47	671.78	0.18	0.15	11.91
August-11	8,760	32.80	730.50	1,219.14	1,949.64	1,552.78	396.86	0.22	0.18	12.10
September-11	9,400	58.40	1,064.29	1,231.53	2,295.82	1,589.23	706.59	0.24	0.17	12.10
October-11	16,400	61.60	775.97	1,696.30	2,472.27	2,211.30	260.97	0.15	0.13	4.24
November-11	21,200	60.80	931.57	2,049.24	2,980.81	2,723.23	257.58	0.14	0.13	4.24
December-11	19,080	55.60	844.06	1,880.92	2,724.98	2,489.43	235.55	0.14	0.13	4.24
January-12	20,320	58.00	900.52	2,072.50	2,973.02	2,727.31	245.71	0.15	0.13	4.24
February-12	21,320	58.00	933.66	2,245.32	3,178.98	2,933.26	245.72	0.15	0.14	4.24
March-12	19,520	56.40	869.17	1,950.29	2,819.46	2,580.52	238.94	0.14	0.13	4.24
April-12	18,400	57.20	836.65	1,858.85	2,695.50	2,453.17	242.33	0.15	0.13	4.24
May-12	18,480	59.20	847.68	1,859.72	2,707.40	2,456.60	250.80	0.15	0.13	4.24
June-12	14,640	46.60	848.01	1,539.52	2,387.52	2,056.44	331.09	0.16	0.14	7.10
July-12	10,800	34.00	848.33	1,219.31	2,067.64	1,656.27	411.37	0.19	0.15	12.10
August-12	10,240	28.80	763.52	1,156.70	1,920.22	1,571.76	348.46	0.19	0.15	12.10
September-12	16,040	60.80	1,383.45	2,947.90	4,331.35	3,595.72	735.63	0.27	0.22	12.10
October-12	18,620	60.80	1,157.51	2,498.57	3,656.08	3,159.48	496.61	0.20	0.17	8.17
Total (All)	**265,160**	**61.60**	**$15,184.62**	**$29,269.07**	**$48,109.77**	**$41,572.50**	**$4,956.58**	**$0.181**	**$0.157**	**$6.34**
Total (last 12-months)	**265,160**	**61.60**	**$15,184.62**	**$29,269.07**	**$48,109.77**	**$41,572.50**	**$4,956.58**	**$0.181**	**$0.157**	**$6.34**
Notes	1	2	3	4	5	6	7	8	9	10

1.) Number of kWh of electric energy used per month
2.) Number of kW of power measured
3.) Electric charges from Delivery provider
4.) Electric charges from Supply provider
5.) Total charges (Delivery + Supplier)
6.) Charges based on the number of kWh of electric energy used
7.) Charges based on the number of kW of power measured
8.) Total Charges ($) / Consumption (kWh)
9.) Consumption Charges ($) / Consumption (kWh)
10.) Demand Charges ($) / Demand (kW)



Utility Data -Magnolia
Electric Graph-2

Magnolia Board of Education
420 Warwick Road Magnolia, NJ 08049

For Service at: **Magnolia School**
Account No.: **6662954608**
Meter No.: **Unmetered**
Electric Service

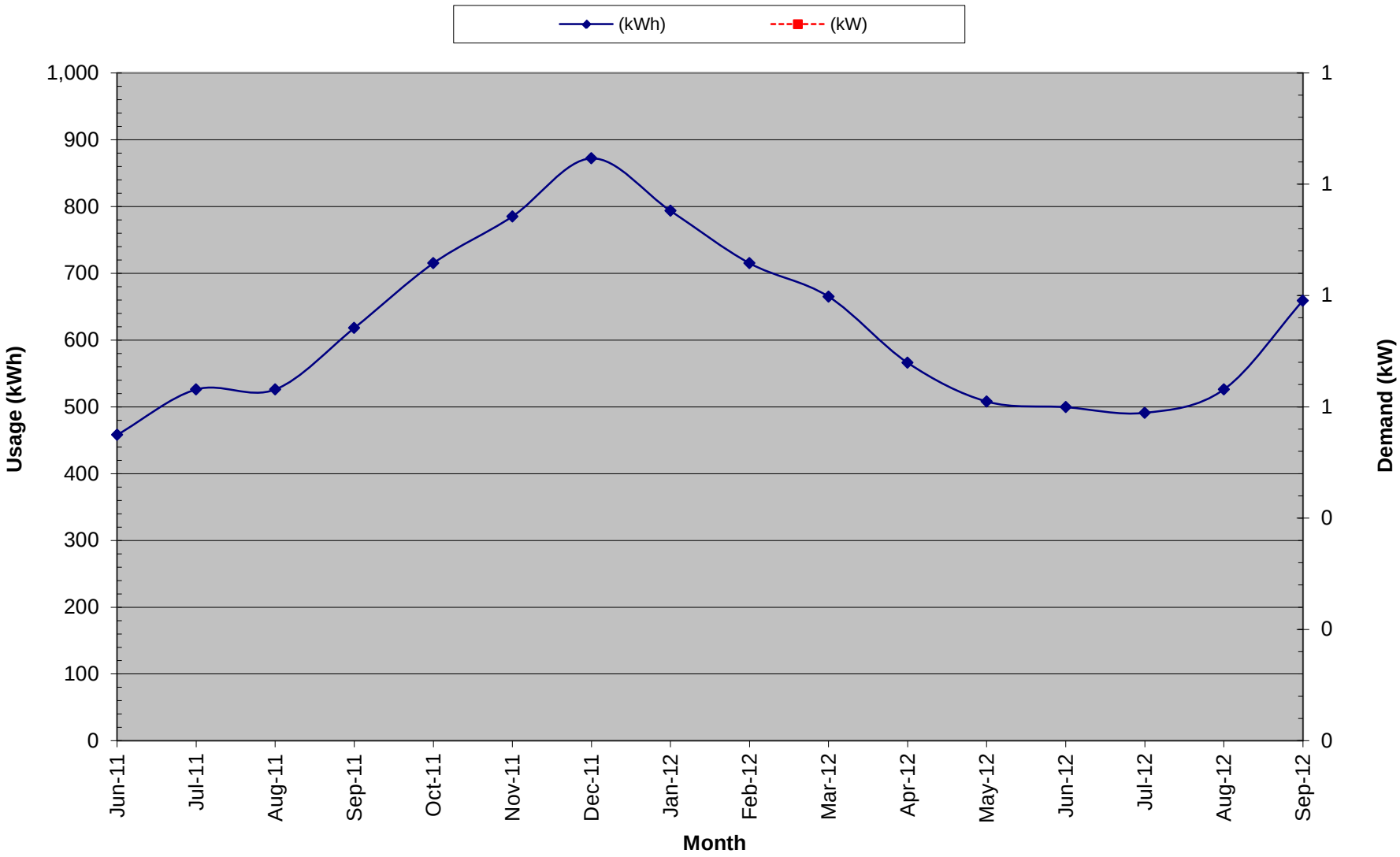
Delivery - Public Service Electric & Gas
Supplier - Public Service Electric & Gas

* averaged values

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Delivery ($)	Supplier ($)	Total ($)	Consumption ($)	Demand ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
June-11	458		109.24	30.60	139.84	139.84		0.31	0.31	#DIV/0!
July-11	526		111.50	37.76	149.26	149.26		0.28	0.28	#DIV/0!
August-11	526		111.58	39.91	151.49	151.49		0.29	0.29	#DIV/0!
September-11	618		114.56	42.54	157.10	157.10		0.25	0.25	#DIV/0!
October-11	715		117.71	46.81	164.52	164.52		0.23	0.23	#DIV/0!
November-11	785		120.40	51.27	171.67	171.67		0.22	0.22	#DIV/0!
December-11	872		123.32	180.60	303.92	303.92		0.35	0.35	#DIV/0!
January-12	794		120.95	116.68	237.62	237.62		0.30	0.30	#DIV/0!
February-12	715		118.57	52.75	171.32	171.32		0.24	0.24	#DIV/0!
March-12	665		116.89	43.91	160.80	160.80		0.24	0.24	#DIV/0!
April-12	566		113.56	37.62	151.18	151.18		0.27	0.27	#DIV/0!
May-12	508		111.61	33.37	144.98	144.98		0.29	0.29	#DIV/0!
June-12	500		111.70	86.55	198.25	198.25		0.40	0.40	#DIV/0!
July-12	491		111.79	139.73	251.52	251.52		0.51	0.51	#DIV/0!
August-12	526		113.05	141.56	254.61	254.61		0.48	0.48	#DIV/0!
September-12	659		117.74	35.29	153.03	153.03		0.23	0.23	#DIV/0!
October-12	722		119.07	43.28	162.35	162.35		0.22	0.22	#DIV/0!
Total (All)	**9,923**	**0.00**	**$1,844.17**	**$1,116.95**	**$2,961.11**	**$2,961.11**	**$0.00**	**$0.298**	**$0.298**	**#DIV/0!**
Total (last 12-months)	**9,923**	**0.00**	**$1,844.17**	**$1,116.95**	**$2,961.11**	**$2,961.11**	**$0.00**	**$0.298**	**$0.298**	**#DIV/0!**
Notes	1	2	3	4	5	6	7	8	9	10

1.) Number of kWh of electric energy used per month
2.) Number of kW of power measured
3.) Electric charges from Delivery provider
4.) Electric charges from Supply provider
5.) Total charges (Delivery + Supplier)
6.) Charges based on the number of kWh of electric energy used
7.) Charges based on the number of kW of power measured
8.) Total Charges ($) / Consumption (kWh)
9.) Consumption Charges ($) / Consumption (kWh)
10.) Demand Charges ($) / Demand (kW)

Electric Usage - Magnolia School - 6662954608



Utility Data -Magnolia
Electric Graph-3

Magnolia Board of Education
420 Warwick Road Magnolia, NJ 08049

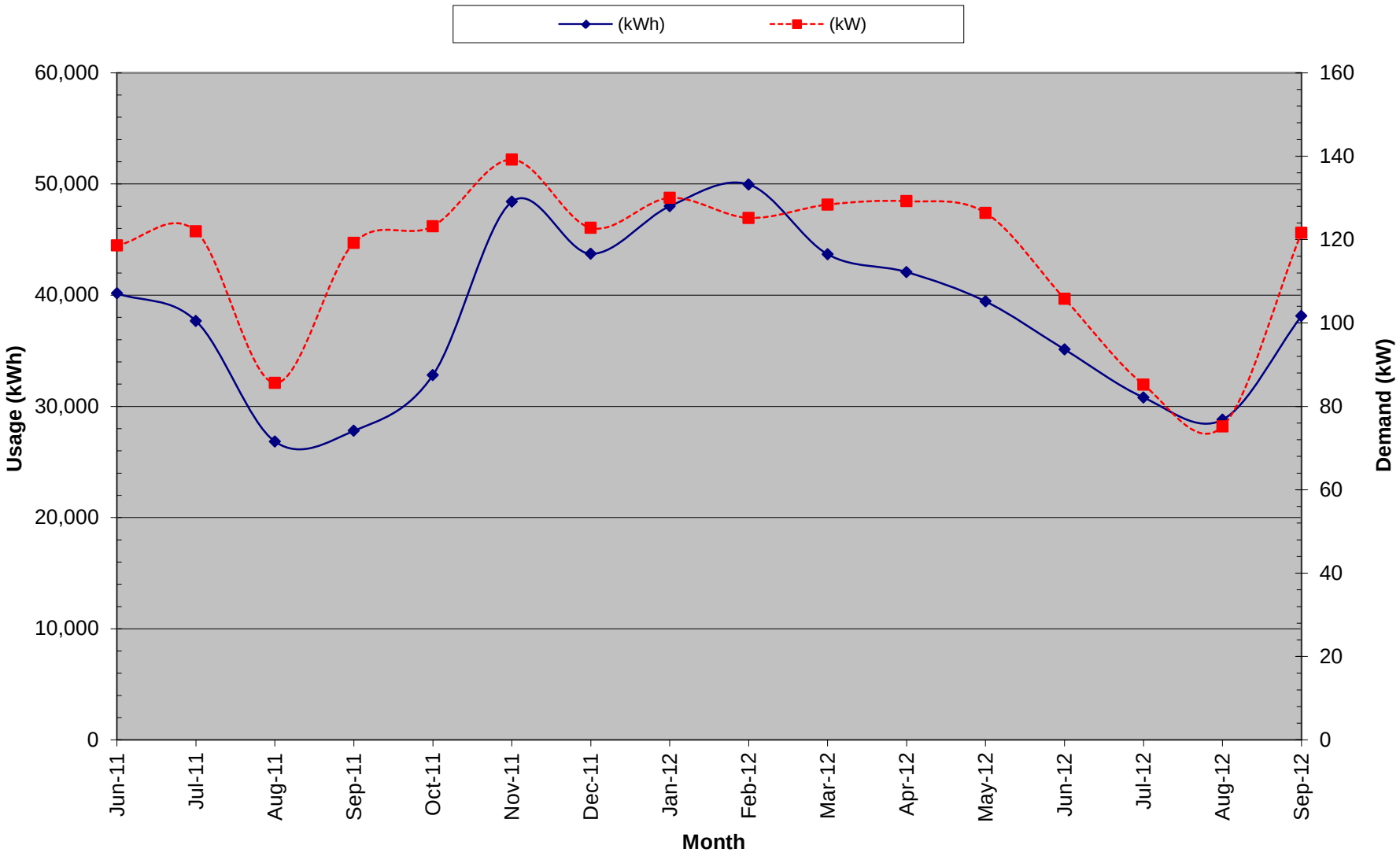
***Use This Sheet For Calcs**

For Service at: **Magnolia School**
Account No.: **Combined** **Delivery -** Public Service Electric & Gas
Meter No.: **Combined** **Supplier -** Public Service Electric & Gas
Electric Service

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption ($/kWh)**	**Demand ($/kW)**
June-11	40,160	118.60	2,640.64	4,282.47	6,923.11	5,739.41	1,183.70	0.17	0.14	9.98
July-11	37,680	122.00	2,868.44	4,256.21	7,124.65	5,671.52	1,453.13	0.19	0.15	11.91
August-11	26,840	85.60	2,053.30	3,393.19	5,446.49	4,410.79	1,035.70	0.20	0.16	12.10
September-11	27,800	119.20	2,495.91	3,340.82	5,836.73	4,394.51	1,442.22	0.21	0.16	12.10
October-11	32,800	123.20	1,551.94	3,392.60	4,944.54	4,422.60	521.94	0.15	0.13	4.24
November-11	48,400	139.20	2,127.22	4,642.01	6,769.23	6,179.51	589.72	0.14	0.13	4.24
December-11	43,720	122.80	1,913.31	4,270.21	6,183.52	5,663.28	520.24	0.14	0.13	4.24
January-12	48,000	130.00	2,095.94	4,827.67	6,923.61	6,372.87	550.74	0.14	0.13	4.24
February-12	49,960	125.20	2,140.98	5,198.96	7,339.94	6,809.53	530.41	0.15	0.14	4.24
March-12	43,680	128.40	1,953.20	4,342.88	6,296.08	5,752.11	543.97	0.14	0.13	4.24
April-12	42,080	129.20	1,905.29	4,210.39	6,115.68	5,568.32	547.36	0.15	0.13	4.24
May-12	39,440	126.40	1,808.77	3,989.43	5,798.20	5,262.71	535.49	0.15	0.13	4.24
June-12	35,120	105.80	2,041.01	3,596.31	5,637.32	4,854.15	783.17	0.16	0.14	7.40
July-12	30,800	85.20	2,273.25	3,203.19	5,476.44	4,445.59	1,030.85	0.18	0.14	12.10
August-12	28,800	75.20	2,073.63	2,994.80	5,068.43	4,158.57	909.86	0.18	0.14	12.10
September-12	38,120	121.60	3,009.20	5,019.44	8,028.64	6,557.38	1,471.26	0.21	0.17	12.10
October-12	43,260	130.40	2,568.21	4,830.73	7,398.94	6,368.45	1,030.49	0.17	0.15	7.90
Total (All)	**656,660**	**139.20**	**$37,520.24**	**$69,791.30**	**$107,311.54**	**$92,631.29**	**$14,680.25**	**$0.163**	**$0.141**	**$7.38**
Total (last 12-months)	**491,380**	**139.20**	**$25,910.01**	**$51,126.02**	**$77,036.03**	**$67,992.47**	**$9,043.56**	**$0.157**	**$0.138**	**$4.87**
Notes	1	2	3	4	5	6	7	8	9	10

1.) Number of kWh of electric energy used per month
2.) Number of kW of power measured
3.) Electric charges from Delivery provider
4.) Electric charges from Supply provider
5.) Total charges (Delivery + Supplier)
6.) Charges based on the number of kWh of electric energy used
7.) Charges based on the number of kW of power measured
8.) Total Charges ($) / Consumption (kWh)
9.) Consumption Charges ($) / Consumption (kWh)
10.) Demand Charges ($) / Demand (kW)

Electric Usage - Magnolia School - Combined



Utility Data -Magnolia
Electric Graph-Combined

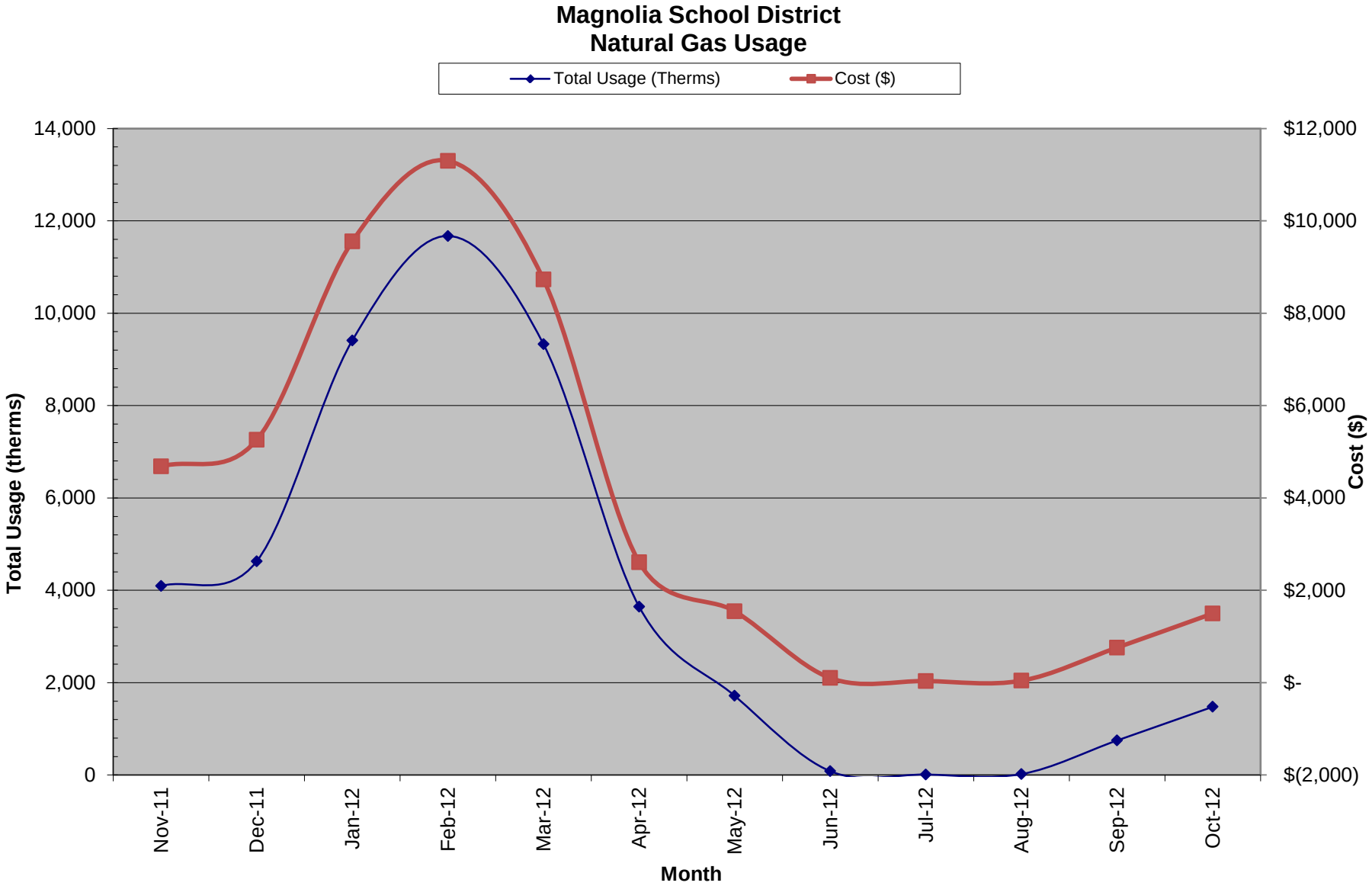
Magnolia Board of Education
420 Warwick Road Magnolia, NJ 08049

Natural Gas Service
Delivery - South Jersey Gas
Supplier - Woodruff Energy

For Service at: **Magnolia School**
Account No.: **20343000103**
Meter No.: **362635**

*averaged values

		Provider Charges			Unit Costs		
Month	**Consumption (Therms)**	**Delivery ($)**	**Supply ($)**	**Total ($)**	**Blended ($/Therm)**	**Delivery ($/Therm)**	**Supply ($/Therm)**
November-11	4,096.00	$ 2,056.96	$ 2,624.73	$ 4,681.69	$ 1.14	$ 0.50	$ 0.64
December-11	4,628.48	$ 2,309.50	$ 2,948.65	$ 5,258.15	$ 1.14	$ 0.50	$ 0.64
January-12	9,410.56	$ 4,679.90	$ 4,874.74	$ 9,554.64	$ 1.02	$ 0.50	$ 0.52
February-12	11,673.60	$ 5,764.65	$ 5,534.87	$ 11,299.52	$ 0.97	$ 0.49	$ 0.47
March-12	9,327.99	$ 4,574.94	$ 4,153.75	$ 8,728.69	$ 0.94	$ 0.49	$ 0.45
April-12	3,646.20	$ 1,085.18	$ 1,522.80	$ 2,607.98	$ 0.72	$ 0.30	$ 0.42
May-12	1,715.09	$ 859.81	$ 687.46	$ 1,547.27	$ 0.90	$ 0.50	$ 0.40
June-12	82.96	$ 64.30	$ 36.79	$ 101.09	$ 1.22	$ 0.78	$ 0.44
July-12	10.44	$ 30.50	$ 5.02	$ 35.52	$ 3.40	$ 2.92	$ 0.48
August-12	20.92	$ 33.21	$ 9.69	$ 42.90	$ 2.05	$ 1.59	$ 0.46
September-12	748.86	$ 411.87	$ 347.83	$ 759.70	$ 1.01	$ 0.55	$ 0.46
October-12	1,476.80	$ 811.85	$ 685.96	$ 1,497.81	$ 1.01	$ 0.55	$ 0.46
Total (All)	**46,837.90**	**$ 22,682.67**	**$ 23,432.29**	**$ 46,114.96**	**$ 0.98**	**$ 0.48**	**$ 0.50**



Utility Data -Magnolia
Gas Graph

Magnolia Board of Education
420 Warwick Road Magnolia, NJ 08049

For Service at: **Magnolia School**
Account No.: **Combined Meters:** **18-0665830-6**
18-0735106-7
18-0665829-8
18-0735105-9

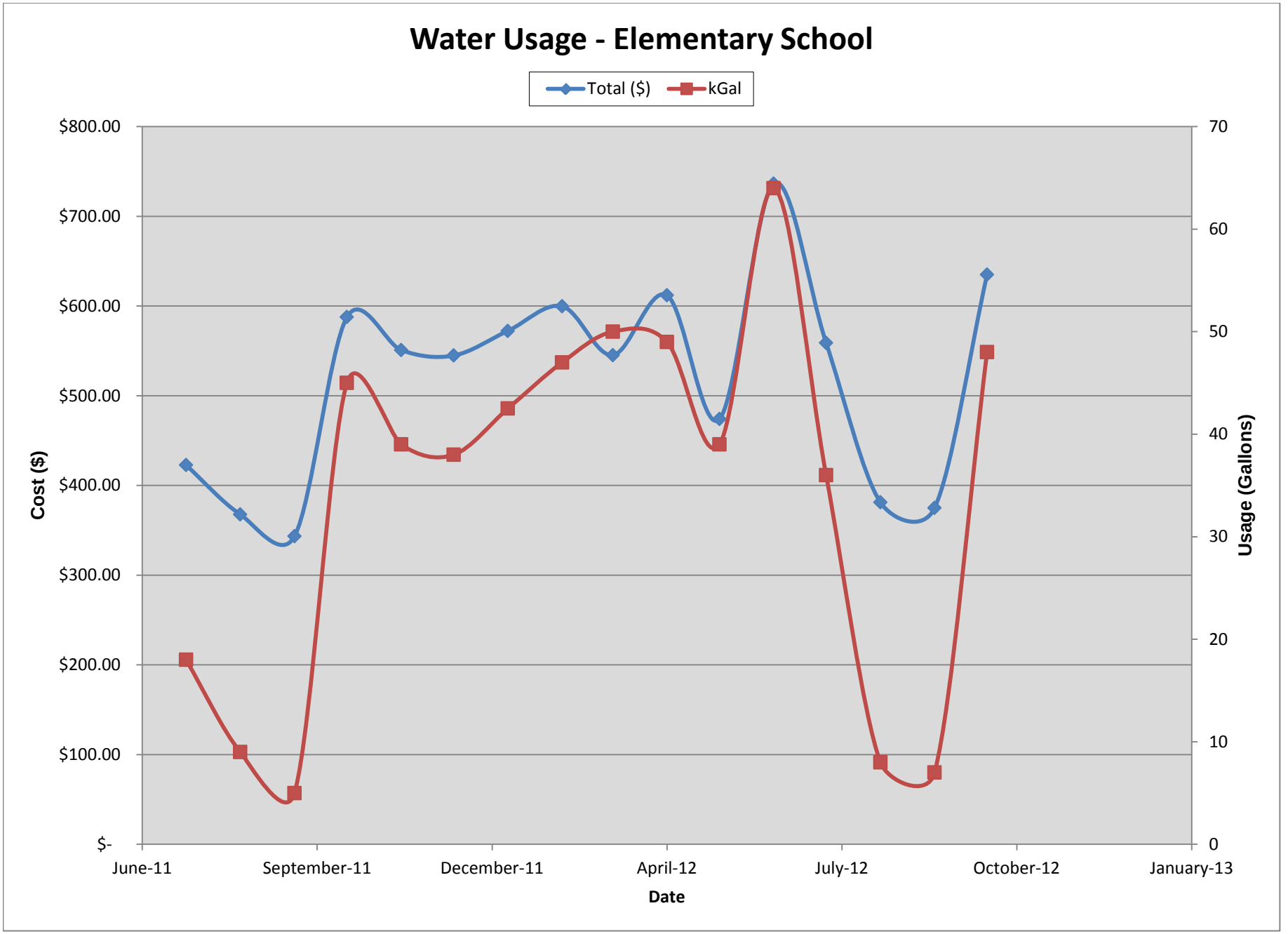
Water
Delivery - **New Jersey American Water**
Supplier - **New Jersey American Water** **average value**

Month	Total ($)	kGal	$/kGal
July-11	$ 422.76	18	$ 23.487
August-11	$ 367.78	9	$ 40.864
September-11	$ 343.35	5	$ 68.670
October-11	$ 587.64	45	$ 13.059
November-11	$ 550.92	39	$ 14.126
December-11	$ 544.82	38	$ 14.337
January-12	$ 572.29	42.5	$ 13.466
February-12	$ 599.76	47	$ 12.761
March-12	$ 545.25	50	$ 10.905
April-12	$ 611.97	49	$ 12.489
May-12	$ 473.96	39	$ 12.153
June-12	$ 736.47	64	$ 11.507
July-12	$ 558.86	36	$ 15.524
August-12	$ 381.25	8	$ 47.656
September-12	$ 374.91	7	$ 53.559
October-12	$ 634.96	48	$ 13.228
Total	**$ 8,306.95**	**544.5**	**$ 15.256**

Sewer

Month	Total ($)	Gallons	$/Gallon
		fixed	
		fixed	
		fixed	
		fixed	
Total	**$ -**	**544.5**	**$ -**

Combined Sewer and Water: $ 15.256 per gallon


Water Usage - Elementary School
Total ($)
kGal
$800.00
$700.00
$600.00
$500.00
$400.00
$300.00
$200.00
$100.00
$-
Cost ($)
70
60
50
40
30
20
10
0
Usage (Gallons)
June-11
September-11
December-11
April-12
July-12
October-12
January-13
Date

APPENDIX B

Equipment Inventory

New Jersey BPU Energy Audit Program
CHA Project #24895
Magnolia BOE - NJBPU
Magnolia Public School
Original Construction Date: 1936
Renovation/Addtion Date: 1953, 1996

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size/Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
RTU-1A	1	Trane	TCD180	-	AHU / NG	4,020 CFM, 5.0 HP, 1,250 OA, 14 Ton	Roof	Media Center	1996	9	
RTU-2	1	Trane	TCD102	K281023760	AHU / NG	2230 CFM, 2 HP. 450 OA, 7.5 Ton	Roof	Offices	1996	9	
RTU-3	1	Trane	PCCB-AACFCGA0B	K95J70908	AHU / NG	4095 CFM, 7.5 HP, 1495 OA	Roof	Corridor	1996	9	
MUA-1, MUA-2	2	Trane	GRAA80GDLADN7GD 305U0J	#1: A95G39450, #2: A95G39451	AHU / NG	7,500 CFM, 100% OA	Roof	Gym	1996	4	
MUA-3	1	Captive Aire	HMUA-6-12	28114	3 HP, NG	3 HP, 3,300 CFM	Roof	Kitchen Hood	1996	4	
EF-5	1	Greenheck	Cube-220-300G	95H11245	Hood Exhaust / Electric	4,300 CFm, 3 HP	Roof	Kitchen Hood	1996	4	
B-2, B-3	1	Hydrotherm	1200B	#1: MSJ-2362, #2: MSJ-2410	Heating / NG	1,200,000 input, 960,000 out, 80%	MER 2	1996 Addition	1996	4	Hot Water
B-1	1	H.B. Smith	44-440 Mills	6906	Heating / NG	3, 350,000 btu/hr input	MER 1	School	1936	-	Steam
DHW	1	Bradford White	EF100T199E3N2	CL8473925	Heating / NG	100 Gallons, 199,999 Input, 80%	MER 2	1996 Addition and various parts of school	1996	-	
P-1, P-2	2	B&G	2x2x7	#1: 1952883, #2: 1952882	Heating / Electric	2 HP, 80 GPM, 81.5%	MER 2	1996 Addition	1996	-4	
P-3, P-4	2	B&G	-	-	Heating / Hot Water	3 HP, 86.5%	MER 1	School	-	-	
UV	40	Nesbitt	-	-	Heating / Hot Water	1.5 Ton	100/200 Roof	School	1936	-	
UV	15	AireDale	VUCW	-	Condenser	1.5 Ton	100/200 Roof	School	1996	4	

Energy Audit of Magnolia BOE
CHA Project No. 24895
Existing Lighting

Cost of Electricity: **$0.163** **$/kWh**
$7.32 **$/kW**

			EXISTING CONDITIONS									
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Retrofit Control	Annual kWh	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	Retrofit control device	(kW/space) * (Annual Hours)	Notes
13	Gym MER	Mechanical Room	5	S 32 P F 2 (ELE)	F42LL	60	0.30	SW	1000	NONE	300	
12	MER	Mechanical Room	3	1B 35 C F 2 (MAG)	F42EE	72	0.22	SW	1000	NONE	216	
12	Maintainence Office	Offices	2	1B 35 C F 2 (MAG)	F42EE	72	0.14	SW	1800	C-OCC	259	
12	Maintainence Storage	Storage Areas	3	1B 35 C F 2 (MAG)	F42EE	72	0.22	SW	1000	C-OCC	216	
13	Maintainence Stair	Stairway	1	S 32 P F 2 (ELE)	F42LL	60	0.06	SW	3200	C-OCC	192	
201	Kitchen	Kitchen	11	T 32 R F 3 (ELE)	F43ILL/2	90	0.99	SW	1040	C-OCC	1,030	
201	Kitchen Office	Offices	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	1800	C-OCC	162	
201	Kitchen Vestibule	Hallways	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	2600	C-OCC	702	
201	Kitchen TR	Restroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2400	C-OCC	216	
201	Utility Washroom	Storage/Janitor	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	1000	C-OCC	90	
201	S6	Storage Areas	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	1000	C-OCC	180	
201	S7	Storage Areas	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	1000	C-OCC	90	
13	Computer Room	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
13	24A	Classrooms	5	S 32 P F 2 (ELE)	F42LL	60	0.30	SW	2400	C-OCC	720	
13	24B	Classrooms	5	S 32 P F 2 (ELE)	F42LL	60	0.30	SW	2400	C-OCC	720	
13	27	Classrooms	21	S 32 P F 2 (ELE)	F42LL	60	1.26	SW	2400	C-OCC	3,024	
13	26	Classrooms	21	S 32 P F 2 (ELE)	F42LL	60	1.26	SW	2400	C-OCC	3,024	
13	29	Classrooms	21	S 32 P F 2 (ELE)	F42LL	60	1.26	SW	2400	C-OCC	3,024	
13	28	Classrooms	21	S 32 P F 2 (ELE)	F42LL	60	1.26	SW	2400	C-OCC	3,024	
13	31	Classrooms	21	S 32 P F 2 (ELE)	F42LL	60	1.26	SW	2400	C-OCC	3,024	
13	30	Classrooms	21	S 32 P F 2 (ELE)	F42LL	60	1.26	SW	2400	C-OCC	3,024	
117	Stair	Stairway	7	CF 23	CFS23/1	23	0.16	SW	3200	C-OCC	515	
13	2nd Floor Corridor	Hallways	9	S 32 P F 2 (ELE)	F42LL	60	0.54	SW	2600	C-OCC	1,404	
13	Boys TR	Restroom	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
7	Boys TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
117	Storage	Storage Areas	3	CF 23	CFS23/1	23	0.07	SW	1000	C-OCC	69	
13	Girls TR	Restroom	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
7	Girls TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
65	Storage	Storage Areas	1	I 100	I100/1	100	0.10	SW	1000	C-OCC	100	
117	Janitor's Closet	Storage/Janitor	1	CF 23	CFS23/1	23	0.02	SW	1000	C-OCC	23	
13	Faculty Room	Classrooms	5	S 32 P F 2 (ELE)	F42LL	60	0.30	SW	2400	C-OCC	720	
7	Men's Faculty TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
7	Women's Faculty TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
13	Corridor	Hallways	3	S 32 P F 2 (ELE)	F42LL	60	0.18	SW	2600	C-OCC	468	
201	Stair	Stairway	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	3200	C-OCC	864	
13	Storage	Storage Areas	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	1000	C-OCC	120	
117	Bathroom	Restroom	1	CF 23	CFS23/1	23	0.02	SW	2400	C-OCC	55	
65	Storage	Storage Areas	1	I 100	I100/1	100	0.10	SW	1000	C-OCC	100	
13	Girl's TR	Restroom	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
7	Girls TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
13	17	Classrooms	16	S 32 P F 2 (ELE)	F42LL	60	0.96	SW	2400	C-OCC	2,304	
117	17A	Classrooms	1	CF 23	CFS23/1	23	0.02	SW	2400	C-OCC	55	
13	16	Classrooms	14	S 32 P F 2 (ELE)	F42LL	60	0.84	SW	2400	C-OCC	2,016	
13	19	Classrooms	14	S 32 P F 2 (ELE)	F42LL	60	0.84	SW	2400	C-OCC	2,016	
13	18	Classrooms	14	S 32 P F 2 (ELE)	F42LL	60	0.84	SW	2400	C-OCC	2,016	
13	21	Classrooms	14	S 32 P F 2 (ELE)	F42LL	60	0.84	SW	2400	C-OCC	2,016	
13	20	Classrooms	14	S 32 P F 2 (ELE)	F42LL	60	0.84	SW	2400	C-OCC	2,016	
13	23	Classrooms	14	S 32 P F 2 (ELE)	F42LL	60	0.84	SW	2400	C-OCC	2,016	
13	22	Classrooms	14	S 32 P F 2 (ELE)	F42LL	60	0.84	SW	2400	C-OCC	2,016	
13	Corridor	Hallways	13	S 32 P F 2 (ELE)	F42LL	60	0.78	SW	2600	C-OCC	2,028	
13	Corridor	Hallways	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2600	C-OCC	1,560	
13	Boy's TR	Restroom	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
7	Boy's TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
13	15	Classrooms	14	S 32 P F 2 (ELE)	F42LL	60	0.84	SW	2400	C-OCC	2,016	
13	14B	Classrooms	8	S 32 P F 2 (ELE)	F42LL	60	0.48	SW	2400	C-OCC	1,152	
13	Conference Room	Conference	6	S 32 P F 2 (ELE)	F42LL	60	0.36	SW	1200	C-OCC	432	
117	Storage	Storage Areas	1	CF 23	CFS23/1	23	0.02	SW	1000	C-OCC	23	
7	TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
13	Child Study Office	Offices	9	S 32 P F 2 (ELE)	F42LL	60	0.54	SW	1800	C-OCC	972	
7	Child Study Office TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
13	Central Office	Offices	4	S 32 P F 2 (ELE)	F42LL	60	0.24	SW	1800	C-OCC	432	
13	Superintendent Office	Offices	4	S 32 P F 2 (ELE)	F42LL	60	0.24	SW	1800	C-OCC	432	
13	Business Office	Offices	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	1800	C-OCC	216	
13	Corridor	Hallways	5	S 32 P F 2 (ELE)	F42LL	60	0.30	SW	2600	C-OCC	780	
13	12	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
7	12 TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
13	11	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
13	Vestibule	Hallways	1	S 32 P F 2 (ELE)	F42LL	60	0.06	SW	2600	C-OCC	156	
13	10	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
13	9	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
7	Corridor	Hallways	6	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.36	SW	2600	C-OCC	936	

Energy Audit of Magnolia BOE
CHA Project No. 24895
Existing Lighting

Cost of Electricity: **$0.163** **$/kWh**
$7.32 **$/kW**

			EXISTING CONDITIONS									
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Retrofit Control	Annual kWh	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	Retrofit control device	(kW/space) * (Annual Hours)	Notes
13	Corridor	Hallways	3	S 32 P F 2 (ELE)	F42LL	60	0.18	SW	2600	C-OCC	468	
13	4	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
13	3	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
13	2	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
117	Storage	Storage Areas	1	CF 23	CFS23/1	23	0.02	SW	1000	C-OCC	23	
7	Girls TR	Restroom	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.12	SW	2400	C-OCC	288	
13	1	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
18	Classroom	Classrooms	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	2400	C-OCC	538	
13	Vestibule	Hallways	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2600	C-OCC	312	
13	Corridor	Hallways	5	S 32 P F 2 (ELE)	F42LL	60	0.30	SW	2600	C-OCC	780	
7	Corridor	Hallways	4	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.24	SW	2600	C-OCC	624	
18	Cafeteria	Cafeteria	16	T 32 R F 4 (ELE)	F44ILL	112	1.79	SW	1600	NONE	2,867	
13	8	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
18	Classroom	Classrooms	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	2400	C-OCC	538	
7	Boy's TR	Classrooms	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.18	SW	2400	C-OCC	432	
65	Janitor's Closet	Storage/Janitor	1	I 100	I100/1	100	0.10	SW	1000	C-OCC	100	
13	7	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
13	6	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
7	Corridor	Hallways	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.12	SW	2600	C-OCC	312	
13	Corridor	Hallways	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2600	C-OCC	312	
13	5	Classrooms	10	S 32 P F 2 (ELE)	F42LL	60	0.60	SW	2400	C-OCC	1,440	
7	TR	Restroom	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	
201	Corridor	Hallways	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.45	SW	2600	C-OCC	1,170	
201	Main Office	Offices	8	T 32 R F 3 (ELE)	F43ILL/2	90	0.72	SW	1800	C-OCC	1,296	
201	Principal Office	Offices	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	1800	C-OCC	324	
201	Nurse	Offices	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.45	SW	1800	C-OCC	810	
201	Nurse TR	Restroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2400	C-OCC	216	
146	Gym / Auditorium	Gynasium	18	High Bay MH 400	MH400/1	458	8.24	Breaker	2600	NONE	21,434	
13	Girls Locker	Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.18	SW	800	C-OCC	144	
13	Boys Locker	Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.18	SW	800	C-OCC	144	
13	S5	Storage Areas	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	1000	C-OCC	120	
201	PE Office	Offices	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	1800	C-OCC	324	
146	Stage	Classrooms	3	High Bay MH 400	MH400/1	458	1.37	Breaker	2400	NONE	3,298	
13	Stage	Classrooms	4	S 32 P F 2 (ELE)	F42LL	60	0.24	Breaker	2400	NONE	576	
201	Music	Classrooms	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.17	SW	2400	C-OCC	2,808	
201	Instrument	Classrooms	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.44	SW	2400	C-OCC	3,456	
201	Storage	Storage Areas	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	1000	C-OCC	90	
201	Storage	Storage Areas	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	1000	C-OCC	90	
201	TR	Restroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2400	C-OCC	216	
201	Corridor	Hallways	11	T 32 R F 3 (ELE)	F43ILL/2	90	0.99	SW	2600	C-OCC	2,574	
201	Staff TR	Restroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2400	C-OCC	216	
201	Group Instruction	Classrooms	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	2400	C-OCC	432	
201	Media Center	Classrooms	22	T 32 R F 3 (ELE)	F43ILL/2	90	1.98	SW	2400	C-OCC	4,752	
25	Media Center	Classrooms	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.08	SW	2400	C-OCC	202	
201	Media Center Storage	Storage Areas	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	1000	C-OCC	360	
201	S3	Storage Areas	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	1000	C-OCC	90	
	Total		**729**				**56.27**				**129,328**	

APPENDIX C

ECM Calculations

Summary of Energy Conservation Measures							
Energy Conservation Measure		**Approx. Costs ($)**	**Approx. Savings ($/year)**	**Payback (Years) w/o Incentive**	**Potential Incentive ($)***	**Payback (Years) w/ Incentive**	**Recommended For Implementation**
ECM-1	Window Replacements and Reduced Glazing	115,000	500	>20	0	>20	
ECM-2a	Replacement of HVAC RTUs	29,000	100	>20	900	>20	
ECM-2b	Replacement of HVAC RTUs	22,000	100	>20	500	>20	
ECM-3	Boiler and Steam System Replacement	511,000	11,500	>20	4,000	>20	X
ECM-4	Replace Window A/C units w/Energy Star Units	2,000	100	20.0	0	20.0	
ECM-5	Install Premium Motors on HW Pumps	4,000	100	>20	2,800	12.0	X
ECM-6	Replace MAUs and EFs for Gymnasium / Auditorium	80,000	1,200	>20	0	>20	
ECM-7	Replace DWH w/ tankless instantaneous unit	4,000	200	20.0	300	18.5	
ECM-8	Lighting Replacement / Upgrades	91,000	5,000	18.2	9,000	16.4	
ECM-9	Install Lighting Controls (Occupancy Sensors)	30,000	4,700	6.4	3,900	5.6	
ECM-10	Lighting Replacements with Lighting Controls (Occupancy Sensors)	121,000	8,700	13.9	12,900	12.4	X
ECM-11	Install Low Flow Plumbing Fixtures	33,000	5,000	6.6	0	6.6	X
ECM-12	Convert Electric Dish Washer Booster Heater to Natural Gas	15,000	900	16.7	0	16.7	

Magnolia BOE - NJBPU
CHA Project #24895
Magnolia Public School
ECM Summary Sheet

ECM-1 Window Replacements and Reduced Glazing

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
115,000	0	0.0	500	500	0	500	(0.9)	0	>20	>20

Expected Life: 30 years
Lifetime Savings: 0 kWh 15,000 therms $ 15,000

ECM-2a Replacement of HVAC RTUs

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
29,000	700	0.0	0	100	0	100	(0.9)	900	>20	>20

Expected Life: 25 years
Lifetime Savings: 17,500 kWh 0 therms $ 2,500

ECM-2b Replacement of HVAC RTUs

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
22,000	600	0.0	0	100	0	100	(0.9)	500	>20	>20

Expected Life: 25 years
Lifetime Savings: 15,000 kWh 0 therms $ 2,500

ECM-3 Boiler and Steam System Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
511,000	0	0.0	11,700	11,500	0	11,500	(0.4)	4,000	>20	>20

Expected Life: 25 years
Lifetime Savings: 0 kWh 292,500 therms $ 287,500

ECM-4 Replace Window A/C units w/Energy Star Units

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
2,000	400	0.0	0	100	0	100	(0.6)	0	20.0	20.0

Expected Life: 12 years
Lifetime Savings: 4,800 kWh 0 therms $ 1,200

ECM-5 Install Premium Motors on HW Pumps

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
4,000	500	0.0	0	100	0	100	(0.7)	2,800	>20	12.0

Expected Life: 15 years
Lifetime Savings: 7,500 kWh 0 therms $ 1,500

ECM-6 Replace MAUs and EFs for Gymnasium / Auditorium

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
80,000	0	0.0	1,200	1,200	0	1,200	(0.8)	0	>20	>20

Expected Life: 15 years
Lifetime Savings: 0 kWh 18,000 therms $ 18,000

ECM-7 Replace DWH w/ tankless instantaneous unit

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
4,000	0	0.0	200	200	0	200	(0.4)	300	20.0	18.5

Expected Life: 12 years
Lifetime Savings: 0 kWh 2,400 therms $ 2,400

ECM-8 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
91,000	27,500	11.9	0	5,000	0	5,000	(0.2)	9,000	18.2	16.4

Expected Life: 15 years
Lifetime Savings: 412,500 kWh 0 therms $ 75,000

ECM-9 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
30,000	30,200	0.0	0	4,700	0	4,700	1.4	3,900	6.4	5.6

Expected Life: 15 years
Lifetime Savings: 453,000 kWh 0 therms $ 70,500

ECM-10 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
121,000	51,300	11.9	0	8,700	0	8,700	0.1	12,900	13.9	12.4

Expected Life: 15 years
Lifetime Savings: 769,500 kWh 0 therms $ 130,500

ECM-11 Install Low Flow Plumbing Fixtures

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Water	Total						
$	kWh	kW	kgal/yr	$	$	$		$	Years	Years
33,000	0	0.0	300	5,000	0	5,000	1.2	0	6.6	6.6

Expected Life: 15 years
Lifetime Savings: 0 kWh 4,500 therms $ 75,000

ECM-12 Convert Electric Dish Washer Booster Heater to Natural Gas

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
15,000	6,000	36.0	(300)	900	0	900	0.9	0	16.7	16.7

Expected Life: 10 years
Lifetime Savings: 60,000 kWh (3,000) therms $ 9,000

Magnolia BOE - NJBPU
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Utility Costs		Yearly Usage	Building Area	Annual Utility Cost	
$ 0.157	$/kWh blended		62,723	Electric	Natural Gas
$ 0.138	$/kWh supply	491,380		$77,036	$46,115
$ 4.87	$/kW	139.20			
$ 0.98	$/Therm	46,838			
$ 15.26	$/kgals	545			

Magnolia Public School

	Item	Savings					Cost	Simple Payback	Life Expectancy	NJ Smart Start Incentives	Direct Install Eligible (Y/N)*	Direct Install Incentives**	Max Incentives	Payback w/ Incentives***	Simple Projected Lifetime Savings					ROI
		kW	kWh	therms	Water kgal	$									kW	kWh	therms	kgal/yr	$	
ECM-1	Window Replacements and Reduced Glazing	0.0	0	513	0	$ 500	$ 115,199	230.4	30	$ -		$ -	$ -	230.4	0.0	0	15,383	0	$ 15,146	(0.9)
ECM-2a	Replacement of HVAC RTUs	0.0	691	0	0	$ 100	$ 29,240	292.4	25	$ 910	Y	$ 20,500	$ 910	283.3	0.0	17,282	0	0	$ 2,709	(0.9)
ECM-2b	Replacement of HVAC RTUs	0.0	599	0	0	$ 100	$ 22,090	220.9	25	$ 488	Y	$ 15,500	$ 488	216.0	0.0	14,981	0	0	$ 2,349	(0.9)
ECM-3	Boiler and Steam System Replacement	0.0	0	11,684	0	$ 11,500	$ 510,529	44.4	25	$ 4,000	Y	$ 75,000	$ 4,000	44.0	0.0	0	292,100	0	$ 287,592	(0.4)
ECM-4	Replace Window A/C units w/Energy Star Units	0.0	430	0	0	$ 100	$ 2,100	21.0	12	$ -				21.0	0.0	5,161	0	0	$ 809	(0.6)
ECM-5	Install Premium Motors on HW Pumps	0.0	503	0	0	$ 100	$ 3,600	36.0	15.0	$ 2,800	Y	$ 2,500	$ 2,800	8.0	0.0	7,550	0	0	$ 1,184	(0.7)
ECM-6	Replace MAUs and EFs for Gymnasium / Auditorium	0.0	0	1,200	0	$ 1,200	$ 79,800	66.5	15.0	$ -		$ -	$ -	66.5	0.0	0	18,003	0	$ 17,726	(0.8)
ECM-7	Replace DWH w/ tankless instantaneous unit	0.0	0	189	0	$ 200	$ 4,049	20.2	12.0	$ 300	Y	$ 2,800	$ 300	18.7	0.0	0	2,274	0	$ 2,239	(0.4)
ECM-8	Lighting Replacement / Upgrades	11.9	27,538	0	0	$ 5,000	$ 90,936	18.2	15.0	$ 8,970	Y	$ 63,700	$ 8,970	16.4	178.7	413,072	0	0	$ 75,201	(0.2)
ECM-9	Install Lighting Controls (Occupancy Sensors)	0.0	30,246	0	0	$ 4,700	$ 29,970	6.4	15.0	$ 3,885	Y	$ 21,000	$ 3,885	5.6	0.0	453,690	0	0	$ 71,127	1.4
ECM-10	Lighting Replacements with Lighting Controls (Occupancy Sensors)	11.9	51,281	0	0	$ 8,700	$ 120,906	13.9	15.0	$ 12,855	Y	$ 75,000	$ 12,855	12.4	178.7	769,210	0	0	$ 131,034	0.1
ECM-11	Install Low Flow Plumbing Fixtures	0.0	0	0	325	$ 5,000	$ 33,148	6.6	15.0	$ -		$ -	$ -	6.6	0.0	0	0	4,868	$ 74,272	1.2
ECM-12	Convert Electric Dish Washer Booster Heater to Natural Gas	36.0	6,048	(258)	0	$ 900	$ 14,985	16.7	10.0	$ -		$ -	$ -	16.7	360.0	60,480	(2,580)	0	$ 27,973	0.9
	Total (Does Not Include ECM-8 & ECM-9)	**47.9**	**59,553**	**13,328**	**325**	**$ 28,400**	**$ 935,647**	32.9	18.1	$ 21,353		$ 191,300	$ 21,353	32.2	538.7	874,665	325,181	4,868	$ 563,032	(0.4)
	Total Measures with Payback <15	**11.9**	**51,784**	**0**	**325**	**$ 13,800**	**$ 157,654**	11.4	15.0	$ 15,655		$ 77,500	$ 15,655	10.3	178.7	776,761	0	4,868	$ 206,490	0.3
	% of Existing	**34%**	**12%**	**28%**	**60%**															

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Note: pricing is for energy calculations only -do not use for procurement

ECM-1: Window Replacement & Reduced Glazing

Existing: Windows are not properly sealed. This can lead to increased energy consumption due to infiltration/exfiltration and heat gain/loss.
Proposed: Install weather strip or caulking to properly seal windows

Linear Feet of window Edge	1,360.0	LF	Cooling System Efficiency	1.2	kW/ton	Heating System Efficiency	80%	
Area of window glass	1,152.0	SF	Ex Occupied Clng Temp.	70	*F	Heating On Temp.	60	*F
Existing Infiltration Factor	**0.20**	**cfm/LF**	Ex Unoccupied Clng Temp.	76	*F	Ex Occupied Htg Temp.	68	*F
Proposed Infiltration Factor	**0.10**	**cfm/LF**	Cooling Occ Enthalpy Setpoint	27.5	Btu/lb	Ex Unoccupied Htg Temp.	58	*F
Existing U Value	**0.60**	**Btuh/SF/°F**	Cooling Unocc Enthalpy Setpoint	27.5	Btu/lb	Electricity	$ 0.157	$/kWh
Proposed U Value	**0.45**	**Btuh/SF/°F**				Natural Gas	$ 0.98	$/therm

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Therms	Proposed Heating Energy Therms
A		B	C	D	E	F	G	H	I	J	K	L
102.5	50.1	0	0	0	-50,126	-45,979	-30,679	-27,569	0	0	0	0
97.5	42.5	6	2	4	-37,368	-33,221	-23,436	-20,326	0	0	0	0
92.5	39.5	45	16	29	-30,240	-26,093	-19,008	-15,898	0	0	0	0
87.5	36.6	146	52	94	-23,234	-19,087	-14,641	-11,531	0	0	0	0
82.5	34.0	298	106	192	-16,596	-12,449	-10,458	-7,348	0	0	0	0
77.5	31.6	476	170	306	-10,202	-6,055	-6,397	-3,287	0	0	0	0
72.5	29.2	662	237	426	-3,809	0	-2,336	0	0	0	0	0
67.5	27.0	740	264	476	0	0	0	0	0	0	0	0
62.5	24.5	765	273	492	0	0	0	0	0	0	0	0
57.5	21.4	733	262	471	10,342	492	6,985	333	0	0	37	25
52.5	18.7	668	239	430	15,267	5,417	10,312	3,659	0	0	75	50
47.5	16.2	659	235	424	20,192	10,342	13,638	6,985	0	0	114	77
42.5	14.4	685	245	441	25,116	15,267	16,965	10,312	0	0	161	109
37.5	12.6	739	264	475	30,041	20,192	20,291	13,638	0	0	219	148
32.5	10.7	717	256	461	34,966	25,116	23,617	16,965	0	0	257	173
27.5	8.6	543	194	349	39,891	30,041	26,944	20,291	0	0	228	154
22.5	6.8	318	114	205	44,816	34,966	30,270	23,617	0	0	153	103
17.5	5.5	245	88	158	49,740	39,891	33,597	26,944	0	0	133	90
12.5	4.1	156	56	100	54,665	44,816	36,923	30,270	0	0	94	64
7.5	2.6	92	33	59	59,590	49,740	40,249	33,597	0	0	61	41
2.5	1.0	36	13	23	64,515	54,665	43,576	36,923	0	0	26	18
-2.5	0.0	19	7	12	69,440	59,590	46,902	40,249	0	0	15	10
-7.5	-1.5	8	3	5	74,364	64,515	50,229	43,576	0	0	7	5
TOTALS		**8,760**	**3,129**	**5,631**					0	0	**1,580**	**1,067**

Existing Window Infiltration	**272**	**cfm**
Existing Window Heat Transfer	**691**	**Btuh/°F**
Proposed Window Infiltration	**136**	**cfm**
Proposed Window Heat Transfer	**518**	**Btuh/°F**

Savings	**513**	**Therms**	**$**	**505**
	0	**kWh**	**$**	**-**
			$	**505**

Window ID	Location	Quantity	Width (ft)	Height (ft)	Linear Feet (LF)	Area (SF)	Infiltration Rate (CFM/LF)	U Value (Btuh/SF/°F)	Infiltration (CFM)	Heat Transfer (Btuh/°F)
1	Exterior Wall	100	3.2	3.6	1360.0	1152.0	0.2	0.6	272.0	691.2
Total		**100**	**3.2**	**3.6**	**1,360.0**	**1,152.0**	**0.20**	**0.60**	**272.0**	**691.2**

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-1: Window Replacements and Reduced Glazing - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Windows	1152.0	$ / SF	$ 45.45	$ 37.04		$ 57,600	$ 57,600	$ -	$ 115,199	
					$ -	$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

$ 115,199	Subtotal
$ -	
$ -	
$ -	
$ 115,199	**Total**

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EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (MBH)
RTU-1A	Media Ceneter	171

Total Electric DX Cooling: *171* *MBH*

ECM-2: Replacement of HVAC RTUs

ECM Description Summary

By replacing older split system DX equipment with higher SEER/EER DX condensing units, significant electrical energy can be saved. Control schemes can be incorporated that were not possible with the older equiopment as well, but the equipment can also operate in same manner as existing (i.e., stand alone, or monitored/sequenced by a BAS). It is recommended these units be replaced by more modern DX split system equipment with high efficiecny fans and compressors.

ASSUMPTIONS			Comments
Electric Cost	$0.157	/ kWh	
Average run hours per Week	50	Hours	
Space Balance Point	55	F	
Space Temperature Setpoint	74	deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	171,200	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	9.8		Units average than 11 years old, EERs were 8 when new
Existing Annual Electric Usage	3,637	kWh	

Item	Value	Units	Comments
Proposed EER	12.1		New ductless mini-splits (per manufacturer)
Proposed Annual Electric Usage	2,945	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Electrical Usage Savings	691	kWh
Annual Cost Savings	$108	
Total Project Cost	$37,600	
Simple Payback	347	years

OAT - DB Bin Temp F	Annual Hours	Cooling Hrs at Temp Above balance point	Assumed % of time of operation	Assumed hrs of Operation
102.5	0	0	100%	0
97.5	0	0	89%	0
92.5	36	11	79%	8
87.5	123	37	68%	25
82.5	477	142	58%	82
77.5	656	195	47%	92
72.5	742	0	0%	0
67.5	784	0	0%	0
62.5	983	0	0%	0
57.5	625	0	0%	0
52.5	438	0	0%	0
47.5	559	0	0%	0
42.5	671	0	0%	0
37.5	1,067	0	0%	0
32.5	685	0	0%	0
27.5	369	0	0%	0
22.5	321	0	0%	0
17.5	184	0	0%	0
12.5	40	0	0%	0
7.5	0	0	0%	0
2.5	0	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0
Total	8,760	385	54%	208

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ECM-2: Replacement of HVAC RTUs - Cost

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
RTU Removal	1	EA		$ 500		$ -	$ 675	$ -	$ 675	
New RTU (14-TON UNIT)	1	EA	$ 15,000	$ 3,000		$ 16,500	$ 4,050	$ -	$ 20,550	
Miscellanous Piping	1	EA	$ 200	$ 150		$ 220	$ 203	$ -	$ 423	
Miscellanous Electric	1	EA	$ 200	$ 150		$ 220	$ 203	$ -	$ 423	
Miscellanous Ductwork	1	EA	$ 200	$ 150		$ 220	$ 203	$ -	$ 423	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

$ 22,493	Subtotal
$ 2,249	10% Contingency
$ 4,499	20% Contractor O&P
$ 29,240	**Total**

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EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (MBH)
RTU-2	General Offices	91
	Total Electric DX Cooling:	*91* *MBH*

ECM-2: Replacement of HVAC RTUs

ECM Description Summary
By replacing older split system DX equipment with higher SEER/EER DX condensing units, significant electrical energy can be saved. Control schemes can be incorporated that were not possible with the older equiopment as well, but the equipment can also operate in same manner as existing (i.e., stand alone, or monitored/sequenced by a BAS). It is recommended these units be replaced by more modern DX split system equipment with high efficiecny fans and compressors.

ASSUMPTIONS			Comments
Electric Cost	$0.157	/ kWh	
Average run hours per Week	50	Hours	
Space Balance Point	55	F	
Space Temperature Setpoint	74	deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	90,600	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	9.2		Units average than 11 years old, EERs were 8 when new
Existing Annual Electric Usage	2,050	kWh	

Item	Value	Units	Comments
Proposed EER	13.0		New ductless mini-splits (per manufacturer)
Proposed Annual Electric Usage	1,451	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Electrical Usage Savings	599	kWh
Annual Cost Savings	$94	
Total Project Cost	$37,600	
Simple Payback	400	years

OAT - DB Bin Temp F	Annual Hours	Cooling Hrs at Temp Above balance point	Assumed % of time of operation	Assumed hrs of Operation
102.5	0	0	100%	0
97.5	0	0	89%	0
92.5	36	11	79%	8
87.5	123	37	68%	25
82.5	477	142	58%	82
77.5	656	195	47%	92
72.5	742	0	0%	0
67.5	784	0	0%	0
62.5	983	0	0%	0
57.5	625	0	0%	0
52.5	438	0	0%	0
47.5	559	0	0%	0
42.5	671	0	0%	0
37.5	1,067	0	0%	0
32.5	685	0	0%	0
27.5	369	0	0%	0
22.5	321	0	0%	0
17.5	184	0	0%	0
12.5	40	0	0%	0
7.5	0	0	0%	0
2.5	0	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0
Total	8,760	385	54%	208

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ECM-2: Replacement of HVAC RTUs - Cost

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
RTU Removal	1	EA		$ 500		$ -	$ 675	$ -	$ 675	
New RTU (7.5-TON UNIT)	1	EA	$ 10,000	$ 3,000		$ 11,000	$ 4,050	$ -	$ 15,050	
Miscellanous Piping	1	EA	$ 200	$ 150		$ 220	$ 203	$ -	$ 423	
Miscellanous Electric	1	EA	$ 200	$ 150		$ 220	$ 203	$ -	$ 423	
Miscellanous Ductwork	1	EA	$ 200	$ 150		$ 220	$ 203	$ -	$ 423	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

Note: pricing is for energy calculations only -do not use for procurement

$ 16,993	Subtotal
$ 1,699	10% Contingency
$ 3,399	20% Contractor O&P
$ 22,090	**Total**

ECM-3: Boiler and Steam System Replacement

Existing Fuel Nat.Gas

Proposed Fuel Nat.Gas

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 0.98	/ Therm	
Proposed Fuel Cost	$ 0.98	/ Therm	
Baseline Fuel Use	39,812	Therms	Based on historical utility data
Existing Boiler Plant Efficiency	65%		Estimated based on age of boiler and heat exchanger
Baseline Boiler Load	2,587,794	Mbtu/yr	Baseline Fuel Use x Existing Efficiency x 100 Mbtu/Therms
Baseline Fuel Cost	$ 39,198		
Proposed Boiler Plant Efficiency	92%		New Boiler Efficiency
Proposed Fuel Use	28,128	Therms	Baseline Boiler Load / Proposed Efficiency / 100 Mbtu/Therms
Proposed Fuel Cost	$ 27,694		

*Note to engineer: Link savings back to summary sheet in appropriate column.

BOILER REPLACEMENT SAVINGS SUMMARY					
	Electric Demand	Electric Usage	Nat Gas Usage	Maint.	Total Cost
	(kW)	(kWh)	(Therms)	($)	($)
Savings	**0**	**0**	**11,684**	**$0**	**$11,504**

ECM-3: Boiler and Steam System Replacement - Cost

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
2,000 MBH NG Condensing Boiler	2	EA	$ 30,000	$ 2,000		$ 66,000	$ 5,400	$ -	$ 71,400	
Flue Installation	25	LF	$ 75.0	$ 15.00		$ 2,063	$ 506	$ -	$ 2,569	
Miscellaneous HW Piping	1	LS	$ 2,000	$ 1,000		$ 2,200	$ 1,350	$ -	$ 3,550	
Boiler Demo	1	LS		$ 7,500		$ -	$ 10,125	$ -	$ 10,125	
HW UV's	11	EA	$ 7,500	$ 2,500		$ 90,750	$ 37,125	$ -	$ 127,875	
AHU (5000 cfm heating only)	1	EA	$ 7,500	$ 2,500		$ 8,250	$ 3,375	$ -	$ 11,625	
Piping Connections (valves, strainers)	12	EA	$ 500	$ 350		$ 6,600	$ 5,670	$ -	$ 12,270	
Insulated Piping	500	LF	$ 25	$ 15		$ 13,750	$ 10,125	$ -	$ 23,875	
Valves	6	EA	$ 150	$ 150		$ 990	$ 1,215	$ -	$ 2,205	
Ductwork	1	LS	$ 10,000	$ 7,500		$ 11,000	$ 10,125	$ -	$ 21,125	
Controls	12	EA	$ 1,500	$ 500		$ 19,800	$ 8,100	$ -	$ 27,900	
Wiring	12	EA	$ 500	$ 1,000		$ 6,600	$ 16,200	$ -	$ 22,800	
Misc	1	LS	$ 10,000	$ 10,000		$ 11,000	$ 13,500	$ -	$ 24,500	
Pumps	2	EA	$ 10,400	$ 765		$ 22,880	$ 2,066	$ -	$ 24,946	
						$ -	$ -	$ -	$ -	

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

$ 386,764	Subtotal
$ 38,676.43	10% Contingency
$ 85,088.14	20% Contractor O&P
$ -	
$ 510,529	**Total**

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ECM-4: Replace Window A/C units with Energy Star Units

ECM Description Summary
By replacing older window air conditioners with newer equipment which have improved SEER ratings, electrical energy can be saved. It is recommended these units be replaced by more efficient Energy Star rated window A/C units.

ASSUMPTIONS				Comments
Electric Cost		$0.157	/ kWh	
Average run hours per Week		50	Hours	Unit is manually turned on (even if after hours)
Space Balance Point		55	F	
Space Temperature Setpoint		70	deg F	setpoint
Avg. BTU / Hr Rating of existing RTU		12,000	Btu / Hr	(typical size for cooling spaces in this type of building)
Average SEER		9.4		

Item	Value	Units	Comments
Total Number of Units	8		
Existing Annual Electric Usage	2,957	kWh	
Proposed SEER	11.0		New Energy Star Unit (per Energy webpage)
Proposed Annual Electric Usage	2,527	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Savings	430	kWh
Annual Cost Savings	$67	

OAT - DB Bin Temp F	Annual Hours	Cooling Hrs at Temp Above balance point	Assumed % of time of operation	Assumed hrs of Operation
102.5	0	0	100%	0
97.5	0	0	89%	0
92.5	36	11	79%	8
87.5	123	37	68%	25
82.5	477	142	58%	82
77.5	656	195	47%	92
72.5	742	221	37%	81
67.5	784	0	0%	0
62.5	983	0	0%	0
57.5	625	0	0%	0
52.5	438	0	0%	0
47.5	559	0	0%	0
42.5	671	0	0%	0
37.5	1,067	0	0%	0
32.5	685	0	0%	0
27.5	369	0	0%	0
22.5	321	0	0%	0
17.5	184	0	0%	0
12.5	40	0	0%	0
7.5	0	0	0%	0
2.5	0	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0

Total	8,760	605	48%	290

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ECM-4: Replace Window A/C units with Energy Star Units - Cost

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
12,000 MBH Energy Star A/C unit	8	EA	$ 220			$ 1,936	$ -	$ -	$ 1,936	
						$ -	$ -	$ -	$ -	

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

$ 1,936	Subtotal
$ 135.52	7% tax
$ -	
$ -	
$ 2,100	**Total**

ECM-5: Install Premium Efficiency Motors

Demand Cost $/kW-month
$ 4.87

Energy Cost $/kWh
$ 0.16

Multipliers		
Material	Labor	Equipment
1.10	1.35	1.10

Savings Analysis

Cost Estimates

#	Description	Location	Existing HP	Load Factor	Existing Efficiency$_a$	Existing kW	New HP$_b$	New Load Factor	New Efficiency$_a$	New kW	Demand Savings	Demand Savings $	Annual Hours	kWh Savings	$ kWh Savings	Total $ Savings	Estimated Cost	Payback Years	Unit Costs: Materials	Unit Costs: Labor	Unit Costs: Equipment	Subtotal Costs: Materials	Subtotal Costs: Labor	Subtotal Costs: Equipment	Total Cost	Remarks
1	P-1	1996 MER	2	0.8	0.815	1.5	2	0.8	0.871	1.4	0.094	$ 6	1,860	176	$ 28	$ 33	$ 646	19.6	$ 342	$ 200	$ -	$ 376	$ 270	$ -	$ 646	
2	P-2	1996 MER	2	0.8	0.815	1.5	2	0.8	0.871	1.4	0.094	$ 6	1,860	176	$ 28	$ 33	$ 646	19.6	$ 342	$ 200	$ -	$ 376	$ 270	$ -	$ 646	
3	P-3	MER	3	0.8	0.865	2.1	3	0.8	0.882	2.0	0.041	$ 2	1,860	76	$ 12	$ 14	$ 943	65.9	$ 550	$ 250	$ -	$ 605	$ 338	$ -	$ 943	
4	P-4	MER	3	0.8	0.865	2.1	3	0.8	0.882	2.0	0.041	$ 2	1,860	76	$ 12	$ 14	$ 943	65.9	$ 550	$ 250	$ -	$ 605	$ 338	$ -	$ 943	
		Total	**10**			**7.1**	**10**			**6.8**	**0.27**	**$ 16**		**503**	**$ 79**	**$ 95**	**$ 3,178**									

Notes

a Existing and new efficiencies should be entered if known. If not known, use provided curve fit based on "DOE Survey Installed Average" and NEMA Premium values, respectively.

b Same as existing HP unless resized to better match load

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.00

ECM-5: Install Premium Efficiency Motors - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
2 HP Motor	2	ea	$ 342	$ 200		$ 752	$ 540	$ -	$ 1,292	
3 HP Motor	2	ea	$ 550	$ 250		$ 1,210	$ 675	$ -	$ 1,885	
Electrical - misc.	1	ls	$ 200	$ 150		$ 220	$ 203	$ -	$ 423	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

$ 3,600	Subtotal
$ -	
$ -	
$ -	
$ 3,600	**Total**

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Magnolia Public School

AIR HANDLER	AREA SERVED	FAN MOTOR HP	CFM	OA CFM
MAU-1	MULTIPURPOSE ROOM	3.0	7,500	7,500
MAU-2	MULTIPURPOSE ROOM	3.0	6,500	6,500
		6.0	*HP*	*14,000* *CFM*

ECM 6: Replace MAUs and EFs for Gymnasium / Auditorium

ECM Description Summary

It is assumed the original system controls provide the full design ventilation outside air flow. Reducing outside air during occupied time periods will reduce heating and cooling energy used during the occupied period. A limit of 1000 PPM of CO2 is recommended in ASHRAE Standard 62-1982, Ventilation for Acceptable Indoor Air Quality. During unoccupied periods the outside air dampers should be closed.

Electric Cost	$ 0.16	/kWh
Natural Gas Cost	$ 0.98	/therm
Facility Ventilation Heating Load	529,200	BTU/Hour[1,2,3,4]
Facility Ventilation Cooling Load		BTU/Hour[1,2,3,4]
Existing Ventilation Heating Usage	8,002	therms[6]
Existing Ventilation Cooling Usage		kWh[6]
Proposed Ventilation Heating Usage	6,801	therms[7]
Proposed Ventilation Cooling Usage		kWh[7]
Proposed Ventilation Fan Savings	0	kWh[5,8]
Total heating savings	1,200	**therms**
Total cooling savings		**kWh**
Total cost savings	1,182	
Estimated Total Project Cost	$15,000	[9]
Simple Payback	13	**years**

Note: pricing is for energy savings calculations only - do not use for procurement

Assumptions

1	14,000	OA AHU airflow based exsiting design drawing schedules
2	35	°F, Assumed average heating Δt (mixed air and supply)
3	10	°F, Assumed average cooling Δt (mixed air and supply)
4	100%	Typical energy recovery unit efficiency assumed based on prior project experience
5	0.0	kW of existing supply fan motor calculated based on electrical data from nameplate
6	1,512	AHU run time per heating season [12 hours/day, 21 days/month, 6 months/year]
7	15%	Estimated savings for DCV based on reducing unit run time from 12 hours to 10 hours per day
8	0	Assumed supply fan run time reduction based on 2 hours/day fan is "off" due to DCV
9	$ 15,000	estimated measure cost for installation of sensors and associated controls

Magnolia BOE - NJBPU
CHA Project #24895
Magnolia Public School

ECM 6: Replace MAUs and EFs for Gymnasium / Auditorium - Cost

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Sensors and Associated Controls	1	EA	$ 5,455	$ 6,700		$ 6,001	$ 9,045	$ -	$ 15,046	
RTU Removal	2	EA		$ 500		$ -	$ 1,350	$ -	$ 1,350	
New RTU	2	EA	$ 24,000	$ 3,000		$ 52,800	$ 8,100	$ -	$ 60,900	
Miscellanous Piping	2	EA	$ 200	$ 150		$ 440	$ 405	$ -	$ 845	
Miscellanous Electric	2	EA	$ 200	$ 150		$ 440	$ 405	$ -	$ 845	
Miscellanous Ductwork	2	EA	$ 200	$ 150		$ 440	$ 405	$ -	$ 845	
						$ -	$ -	$ -	$ -	

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

$ 79,831	Subtotal
$ -	
$ -	
$ -	
$ 79,800	**Total**

Magnolia BOE - NJBPU
CHA Project #24895

ECM-7: Replace DWH w/ tankless instantaneous unit

Summary

* Replace Existing NG 100 gallon DHWH w/ Instantaneous, Condensing, NG DHW Heater

Item	Value	Units	Formula/Comments
Occupied days per week	5	days/wk	
Water supply Temperature	60	˚F	Termperature of water coming into building
Hot Water Temperature	120	˚F	
Hot Water Usage per day	463	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	46,255	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	100	Gallons	Per manufacturer nameplate
Hot Water Temperature	120	˚F	Per building personnel
Average Room Temperature	70	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	1.0	MBH	
Annual Standby Hot Water Load	9,125	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	55,380	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	80%		Per Manufacturer
Total Annual Energy Required	69,225	Mbtu/yr	
Total Annual Natural Gas Required	**692.3**	**Therms /yr**	**Per Utility Bills**
New Tank Size	0	Gallons	tankless
Hot Water Temperature	120	˚F	
Average Room Temperature	70	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.0	MBH	
Annual Standby Hot Water Load	0	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	46,255	MBTU/yr	
Proposed Avg. Hot water heater efficiency	92%		Based on condensing tankless DHW Heater
Proposed Total Annual Energy Required	50,277	MBTU/yr	
Proposed Fuel Use	503	Therms /yr	Standby Losses and inefficient DHW heater eliminated
Proposed Fuel Savings	**189**	**Therms /yr**	
Natural Gas Utility Unit Cost	$0.98	$/Therm	
Existing Operating Cost of DHW	$682	$/yr	
Proposed Operating Cost of DHW	$495	$/yr	
Annual Utility Cost Savings	**$187**	**$/yr**	

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-7: Replace DWH w/ tankless instantaneous unit - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Gas-Fired DHW Heater Removal	1	LS		$ 50		$ -	$ 68	$ -	$ 68	
Rannai Tankless Gas-Fired DHW Heater	1	LS	$ 1,000	$ 1,000		$ 1,100	$ 1,350	$ -	$ 2,450	
Miscellaneous Electrical	1	LS	$ 300			$ 330	$ -	$ -	$ 330	
Miscellaneous Piping and Valves	1	LS	$ 200			$ 220	$ -	$ -	$ 220	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

$ 3,068	Subtotal
$ 307	10% Contingency
$ 675	20% Contractor O&P
$ -	
$ 4,049	**Total**

ECM-11: Install Low Flow Plumbing Fixtures

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$15.26	$ / kGal
Urinals in Building	15	
Average Flushes / Urinal (per Day)	9	
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	15	
Proposed Gallons / Flush	1.6	Gal
Proposed Material Cost	$360	
Proposed Installation Cost	$269	
Total cost of new urinals & valves	$9,431	

SAVINGS		
Current Urinal Water Use	172	kGal / year
Proposed Urinal Water Use	79	kGal / year
Water Savings	94	kGal / year
Cost Savings	$1,428	/ year
Simple Payback	6.6	years

ECM-11: Install Low Flow Plumbing Fixtures

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$15.26	$ / kGal
Toilets in Building	37	
Average Flushes / Toilet (per Day)	9	
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	37	
Proposed Gallons / Flush	1.6	Gal
Proposed Material Cost of new Flush Valves	$532	
Proposed Installation cost of new Flush Valves	$109	
Total cost of new toilets & valves	$23,717	

SAVINGS		
Current Toilet Water Use	425	kGal / year
Proposed Toilet Water Use	194	kGal / year
Water Savings	231	kGal / year
Cost Savings	$3,523	/ year
Simple Payback	6.7	years

TITLE: **ECM-12: Convert Electric Dish Washer Booster Heater to Natural Gas**
PROJECT: Magnolia BOE - NJBPU
SITE: Magnolia Public School

DESCRIPTION: When fuel costs are less expensive than electric, converting from electric to fuel heating results in reduce cost.

GIVEN:

Electrical Energy Cost	=	$0.157	$/kWh	
Electrical Demand Cost	=	$ 4.87	$/kW	
Fuel Energy Cost	=	$0.98	$/Therm (Nat'l Gas)	
Booster Heater Capacity	=	12	Kw	
Operation (Hours/Day)	=	4.00	Hours/Day	
Operation (Days/Year)	=	180.00	Day/Year	Sept- June =10months X 21 days/ mo =210 days- 30 days =180 days
Operation (Hours/Year)	=	720	Hours/Year	

ASSUMPTION:

Proposed Efficiency (Fuel)	=	80%
Existing Efficiency (Electric)	=	100%
Operating Months per Year	=	10
Scheduled Usage	=	70%
Utilization Factor (Demand)	=	30%

FORMULA:
Energy Use (Kwh) = (Capacity(Kw)) x (Hours of Operation/Year) x (Scheduled Usage) / (Efficiency)
Fuel Use (Unit) = (Electrical Use(Kwh)) x (3413 btu/kw) x (Electrical Efficiency) / (Fuel Efficiency) / (Heating Value of Fuel)
Energy Demand (Kw) = (Capacity (Kw)) x (Months/Year) x (Demand Utilization Factor)
Electrical Energy Cost ($) = (Energy Cost (Kwh) x ($/Kwh)) + (Demand (Kw) x ($/Kw))
Fuel Energy Cost ($) = ((Fuel Use(Unit) x Fuel Cost($/Unit))

CALCULATION:

	Capacity		Hours/Year		Scheduled Usage		Efficiency		
Electric Usage = (	12	)x(	720	)x(	70%	)/(	100%	) =	**6,048 Kwh**

	Electrical Use		Conversion		Efficiency (Electric)		Efficiency (Fuel)		Conversion		
Fuel Usage = (	6,048	)x(	3,413	) x (	100%	)/(	80%	)/(	100,000	) =	**258 Therm**

	Capacity		Months/Year		Utilization Factor		
Electric Demand =(	12	)*(	10	)*(	30%	) =	**36 Kw**

	Kwh		$/kwh		Kw		$/Kw		
Existing Energy Cost = (	**6,048**	)*(	$0.157	)+(	**36**	)*(	$4.87	) =	**$ 1,123**

	Therm		$/fuel unit		
Proposed Energy Cost = (	**258**	)*(	$0.985	) =	**$ 254**

Result

Existing Annual Use=	**6,048**	**Kwh**	**36**	**Kw**	**$**	**1,123**
Proposed Annual Use=			**258**	**Therm**	**$**	**254**

Annual Savings=	**6,048**	**Kwh**	**36**	**Kw**	**$**	**869**
Savings as Percent of Existing =			**(258)**	**Therm**		**77%**

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-12: Convert Electric Dish Washer Booster Heater to Natural Gas - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
New Booster Heater	1	ea	$ 5,400.00	$ 6,700.00		$ 5,940	$ 9,045	$ -	$ 14,985	
					$ -	$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

Note: Cost Estimates are for Energy Savings Calulations only- Do not use for procurement !

$ 14,985	Subtotal
$ -	
$ -	
$ -	
$ 14,985	**Total**

New Jersey Pay For Performance Incentive Program

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per April, 2012.
Building must have a minimum average electric demand of 100 kW. This minimum is waived for buildings owned by local governements or non-profit organizations.
Values used in this calculation are for measures with a positive return on investment (ROI) only.

Total Building Area (Square Feet)	62,723
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilites (BPU)

Incentive #1		
Audit is funded by NJ BPU	$0.10	$/sqft

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$77,036	$46,115
Existing Usage (from utility)	491,380	46,838
Proposed Savings	59,553	13,328
Existing Total MMBtus	6,361	
Proposed Savings MMBtus	1,536	
% Energy Reduction	**24.1%**	
Proposed Annual Savings	$28,400	

	Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm
Incentive #2	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.11	$1.25
Incentive #3	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.11	$1.25

	Incentives $		
	Elec	Gas	Total
Incentive #1	$0	$0	$6,272
Incentive #2	$6,551	$16,661	$23,211
Incentive #3	$6,551	$16,661	$23,211
Total All Incentives	**$13,102**	**$33,321**	**$52,695**

Total Project Cost	$935,647

		Allowable Incentive
% Incentives #1 of Utility Cost*	5.1%	$6,272
% Incentives #2 of Project Cost**	2.5%	$23,211
% Incentives #3 of Project Cost**	2.5%	$23,211
Total Eligible Incentives***	**$52,695**	
Project Cost w/ Incentives	$882,952	

Project Payback (years)	
w/o Incentives	w/ Incentives
32.9	31.1

* Maximum allowable incentive is 50% of annual utility cost if not funded by NJ BPU, and %25 if it is.

** Maximum allowable amount of Incentive #2 is 25% of total project cost.
Maximum allowable amount of Incentive #3 is 25% of total project cost.

*** Maximum allowable amount of Incentive #1 is $50,000 if not funded by NJ BPU, and $25,000 if it is.
Maximum allowable amount of Incentive #2 & #3 is $1 million per gas account and $1 million per electric account; maximum 2 million per project

ECM-1 Lighting Replacements

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$90,936	**11.9**	**27,538**	**0**	**$5,535**	**0**	**$5,535**	**$8,970**	**16.4**	**14.8**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-2 Install Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$29,970	**-0.1**	**30,246**	**0**	**$4,922**	**0**	**$4,922**	**$3,885**	**6.1**	**5.3**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-3 Lighting Replacements with Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$120,906	**11.9**	**51,281**	**0**	**$9,405**	**0**	**$9,405**	**$12,855**	**12.9**	**11.5**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Energy Audit of Magnolia BOE
CHA Project No. 24895
ECM-1 Lighting Replacements

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
13	Gym MER	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	1000	300	5	0	F42SSILL	48	0.2	SW	1,000	240	60	0.1	$ 15.05	$ 573.75	$50	38.1	34.8
12	MER	3	1B 35 C F 2 (MAG)	F42EE	72	0.2	SW	1000	216	3	1B 35 C F 2	F42SSILL	48	0.1	SW	1,000	144	72	0.1	$ 18.06	$ 344.25	$30	19.1	17.4
12	Maintainence Office	2	1B 35 C F 2 (MAG)	F42EE	72	0.1	SW	1800	259	2	1B 35 C F 2	F42SSILL	48	0.1	SW	1,800	173	86	0.0	$ 18.30	$ 229.50	$20	12.5	11.4
12	Maintainence Storage	3	1B 35 C F 2 (MAG)	F42EE	72	0.2	SW	1000	216	3	1B 35 C F 2	F42SSILL	48	0.1	SW	1,000	144	72	0.1	$ 18.06	$ 344.25	$30	19.1	17.4
13	Maintainence Stair	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	3200	192	1	0	F42SSILL	48	0.0	SW	3,200	154	38	0.0	$ 7.31	$ 114.75	$10	15.7	14.3
201	Kitchen	11	T 32 R F 3 (ELE)	F43ILL/2	90	1.0	SW	1040	1,030	11	0	F43SSILL	72	0.8	SW	1,040	824	206	0.2	$ 50.96	$ 1,262.25	$110	24.8	22.6
201	Kitchen Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1800	162	1	0	F43SSILL	72	0.1	SW	1,800	130	32	0.0	$ 6.86	$ 114.75	$10	16.7	15.3
201	Kitchen Vestibule	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2600	702	3	0	F43SSILL	72	0.2	SW	2,600	562	140	0.1	$ 27.63	$ 344.25	$30	12.5	11.4
201	Kitchen TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	0	F43SSILL	72	0.1	SW	2,400	173	43	0.0	$ 8.62	$ 114.75	$10	13.3	12.1
201	Utility Washroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	SW	1,000	72	18	0.0	$ 4.52	$ 114.75	$10	25.4	23.2
201	S6	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1000	180	2	0	F43SSILL	72	0.1	SW	1,000	144	36	0.0	$ 9.03	$ 229.50	$20	25.4	23.2
201	S7	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	SW	1,000	72	18	0.0	$ 4.52	$ 114.75	$10	25.4	23.2
13	Computer Room	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
13	24A	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	0	F42SSILL	48	0.2	SW	2,400	576	144	0.1	$ 28.74	$ 573.75	$50	20.0	18.2
13	24B	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	0	F42SSILL	48	0.2	SW	2,400	576	144	0.1	$ 28.74	$ 573.75	$50	20.0	18.2
13	27	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	SW	2,400	2,419	605	0.3	$ 120.72	$ 2,409.75	$210	20.0	18.2
13	26	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	SW	2,400	2,419	605	0.3	$ 120.72	$ 2,409.75	$210	20.0	18.2
13	29	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	SW	2,400	2,419	605	0.3	$ 120.72	$ 2,409.75	$210	20.0	18.2
13	28	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	SW	2,400	2,419	605	0.3	$ 120.72	$ 2,409.75	$210	20.0	18.2
13	31	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	SW	2,400	2,419	605	0.3	$ 120.72	$ 2,409.75	$210	20.0	18.2
13	30	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	SW	2,400	2,419	605	0.3	$ 120.72	$ 2,409.75	$210	20.0	18.2
117	Stair	7	CF 23	CFS23/1	23	0.2	SW	3200	515	7	CF 23	CFS23/1	23	0.2	SW	3,200	515	-	0.0	$ -	$ -	$0		#DIV/0!
13	2nd Floor Corridor	9	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	0	F42SSILL	48	0.4	SW	2,600	1,123	281	0.1	$ 55.26	$ 1,032.75	$90	18.7	17.1
13	Boys TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	SW	2,400	230	58	0.0	$ 11.50	$ 229.50	$20	20.0	18.2
7	Boys TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
117	Storage	3	CF 23	CFS23/1	23	0.1	SW	1000	69	3	CF 23	CFS23/1	23	0.1	SW	1,000	69	-	0.0	$ -	$ -	$0		#DIV/0!
13	Girls TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	SW	2,400	230	58	0.0	$ 11.50	$ 229.50	$20	20.0	18.2
7	Girls TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
65	Storage	1	I 100	I100/1	100	0.1	SW	1000	100	1	CF 26	CFQ26/1-L	27	0.0	SW	1,000	27	73	0.1	$ 18.31	$ 40.50	$0	2.2	2.2
117	Janitor's Closet	1	CF 23	CFS23/1	23	0.0	SW	1000	23	1	CF 23	CFS23/1	23	0.0	SW	1,000	23	-	0.0	$ -	$ -	$0		#DIV/0!
13	Faculty Room	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	0	F42SSILL	48	0.2	SW	2,400	576	144	0.1	$ 28.74	$ 573.75	$50	20.0	18.2
7	Men's Faculty TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
7	Women's Faculty TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
13	Corridor	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	468	3	0	F42SSILL	48	0.1	SW	2,600	374	94	0.0	$ 18.42	$ 344.25	$30	18.7	17.1
201	Stair	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	3200	864	3	0	F43SSILL	72	0.2	SW	3,200	691	173	0.1	$ 32.91	$ 344.25	$30	10.5	9.5
13	Storage	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	0	F42SSILL	48	0.1	SW	1,000	96	24	0.0	$ 6.02	$ 229.50	$20	38.1	34.8
117	Bathroom	1	CF 23	CFS23/1	23	0.0	SW	2400	55	1	CF 23	CFS23/1	23	0.0	SW	2,400	55	-	0.0	$ -	$ -	$0		#DIV/0!
65	Storage	1	I 100	I100/1	100	0.1	SW	1000	100	1	CF 26	CFQ26/1-L	27	0.0	SW	1,000	27	73	0.1	$ 18.31	$ 40.50	$0	2.2	2.2
13	Girl's TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	SW	2,400	230	58	0.0	$ 11.50	$ 229.50	$20	20.0	18.2
7	Girls TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
13	17	16	S 32 P F 2 (ELE)	F42LL	60	1.0	SW	2400	2,304	16	0	F42SSILL	48	0.8	SW	2,400	1,843	461	0.2	$ 91.98	$ 1,836.00	$160	20.0	18.2
117	17A	1	CF 23	CFS23/1	23	0.0	SW	2400	55	1	CF 23	CFS23/1	23	0.0	SW	2,400	55	-	0.0	$ -	$ -	$0		#DIV/0!
13	16	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	SW	2,400	1,613	403	0.2	$ 80.48	$ 1,606.50	$140	20.0	18.2
13	19	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	SW	2,400	1,613	403	0.2	$ 80.48	$ 1,606.50	$140	20.0	18.2
13	18	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	SW	2,400	1,613	403	0.2	$ 80.48	$ 1,606.50	$140	20.0	18.2
13	21	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	SW	2,400	1,613	403	0.2	$ 80.48	$ 1,606.50	$140	20.0	18.2
13	20	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	SW	2,400	1,613	403	0.2	$ 80.48	$ 1,606.50	$140	20.0	18.2
13	23	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	SW	2,400	1,613	403	0.2	$ 80.48	$ 1,606.50	$140	20.0	18.2
13	22	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	SW	2,400	1,613	403	0.2	$ 80.48	$ 1,606.50	$140	20.0	18.2
13	Corridor	13	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2600	2,028	13	0	F42SSILL	48	0.6	SW	2,600	1,622	406	0.2	$ 79.82	$ 1,491.75	$130	18.7	17.1
13	Corridor	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2600	1,560	10	0	F42SSILL	48	0.5	SW	2,600	1,248	312	0.1	$ 61.40	$ 1,147.50	$100	18.7	17.1
13	Boy's TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	SW	2,400	230	58	0.0	$ 11.50	$ 229.50	$20	20.0	18.2
7	Boy's TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
13	15	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	SW	2,400	1,613	403	0.2	$ 80.48	$ 1,606.50	$140	20.0	18.2
13	14B	8	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	0	F42SSILL	48	0.4	SW	2,400	922	230	0.1	$ 45.99	$ 918.00	$80	20.0	18.2
13	Conference Room	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	1200	432	6	0	F42SSILL	48	0.3	SW	1,200	346	86	0.1	$ 20.41	$ 688.50	$60	33.7	30.8
117	Storage	1	CF 23	CFS23/1	23	0.0	SW	1000	23	1	CF 23	CFS23/1	23	0.0	SW	1,000	23	-	0.0	$ -	$ -	$0		#DIV/0!
7	TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
13	Child Study Office	9	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	1800	972	9	0	F42SSILL	48	0.4	SW	1,800	778	194	0.1	$ 41.17	$ 1,032.75	$90	25.1	22.9
7	Child Study Office TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
13	Central Office	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1800	432	4	0	F42SSILL	48	0.2	SW	1,800	346	86	0.0	$ 18.30	$ 459.00	$40	25.1	22.9
13	Superintendent Office	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1800	432	4	0	F42SSILL	48	0.2	SW	1,800	346	86	0.0	$ 18.30	$ 459.00	$40	25.1	22.9
13	Business Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1800	216	2	0	F42SSILL	48	0.1	SW	1,800	173	43	0.0	$ 9.15	$ 229.50	$20	25.1	22.9
13	Corridor	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780	5	0	F42SSILL	48	0.2	SW	2,600	624	156	0.1	$ 30.70	$ 573.75	$50	18.7	17.1
13	12	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
7	12 TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
13	11	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
13	Vestibule	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	156	1	0	F42SSILL	48	0.0	SW	2,600	125	31	0.0	$ 6.14	$ 114.75	$10	18.7	17.1
13	10	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
13	9	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
7	Corridor	6	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.4	SW	2600	936	6	2T 17 R F 2 (ELE)	F22ILL	33	0.2	SW	2,600	515	421	0.2	$ 82.89	$ 648.00	$60	7.8	7.1
13	Corridor	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	468	3	0	F42SSILL	48	0.1	SW	2,600	374	94	0.0	$ 18.42	$ 344.25	$30	18.7	17.1
13	4	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
13	3	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
13	2	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
117	Storage	1	CF 23	CFS23/1	23	0.0	SW	1000	23	1	CF 23	CFS23/1	23	0.0	SW	1,000	23	-	0.0	$ -	$ -	$0		#DIV/0!
7	Girls TR	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	288	2	2T 17 R F 2 (ELE)	F22ILL	33	0.1	SW	2,400	158	130	0.1	$ 25.87	$ 216.00	$20	8.4	7.6
13	1	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
18	Classroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2400	538	2	0	F44SSILL	96	0.2	SW	2,400	461	77	0.0	$ 15.33	$ 283.50	$20	18.5	17.2
13	Vestibule	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	0	F42SSILL	48	0.1	SW	2,600	250	62	0.0	$ 12.28	$ 229.50	$20	18.7	17.1
13	Corridor	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780	5	0	F42SSILL	48	0.2	SW	2,600	624	156	0.1	$ 30.70	$ 573.75	$50	18.7	17.1
7	Corridor	4	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2600	624	4	2T 17 R F 2 (ELE)	F22ILL	33	0.1	SW	2,600	343	281	0.1	$ 55.26	$ 432.00	$40	7.8	7.1
18	Cafeteria	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	1600	2,867	16	0	F44SSILL	96	1.5	SW	1,600	2,458	410	0.3	$ 89.25	$ 2,268.00	$160	25.4	23.6
13	8	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
18	Classroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2400	538	2	0	F44SSILL	96	0.2	SW	2,400	461	77	0.0	$ 15.33	$ 283.50	$20	18.5	17.2
7	Boy's TR	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2400	432	3	2T 17 R F 2 (ELE)	F22ILL	33	0.1	SW	2,400	238	194	0.1	$ 38.80	$ 324.00	$30	8.4	7.6
65	Janitor's Closet	1	I 100	I100/1	100	0.1	SW	1000	100	1	CF 26	CFQ26/1-L	27	0.0	SW	1,000	27	73	0.1	$ 18.31	$ 40.50	$0	2.2	2.2
13	7	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
13	6	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
7	Corridor	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2600	312	2	2T 17 R F 2 (ELE)	F22ILL	33	0.1	SW	2,600	172	140	0.1	$ 27.63	$ 216.00	$20	7.8	7.1
13	Corridor	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	0	F42SSILL	48	0.1	SW	2,600	250	62	0.0	$ 12.28	$ 229.50	$20	18.7	17.1
13	5	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	SW	2,400	1,152	288	0.1	$ 57.48	$ 1,147.50	$100	20.0	18.2
7	TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	65	0.0	$ 12.93	$ 108.00	$10	8.4	7.6
201	Corridor	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,170	5	0	F43SSILL	72	0.4	SW	2,600	936	234	0.1	$ 46.05	$ 573.75	$50	12.5	11.4
201	Main Office	8	T 32 R F 3 (ELE)	F43ILL/2	90	0.7	SW	1800	1,296	8	0	F43SSILL	72	0.6	SW	1,800	1,037	259	0.1	$ 54.90	$ 918.00	$80	16.7	15.3
201	Principal Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1800	324	2	0	F43SSILL	72	0.1	SW	1,800	259	65	0.0	$ 13.72	$ 229.50	$20	16.7	15.3
201	Nurse	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	1800	810	5	0	F43SSILL	72	0.4	SW	1,800	648	162	0.1	$ 34.31	$ 573.75	$50	16.7	15.3
201	Nurse TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	0	F43SSILL	72	0.1	SW	2,400	173	43	0.0	$ 8.62	$ 114.75	$10	13.3	12.1
146	Gym / Auditorium	18	High Bay MH 400	MH400/1	458	8.2	Breaker	2600	21,434	18	C 54 C F 6	F46GHL	351	6.3	Breaker	2,600	16,427	5,008	1.9	$ 985.42	$ 9,963.00	$1,800	10.1	8.3
13	Girls Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	800	144	3	0	F42SSILL	48	0.1	SW	800	115	29	0.0	$ 7.86	$ 344.25	$30	43.8	40.0
13	Boys Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	800	144	3	0	F42SSILL	48	0.1	SW	800	115	29	0.0	$ 7.86	$ 344.25	$30	43.8	40.0
13	S5	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	0	F42SSILL	48	0.1	SW	1,000	96	24	0.0	$ 6.02	$ 229.50	$20	38.1	34.8
201	PE Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1800	324	2	0	F43SSILL	72	0.1	SW	1,800	259	65	0.0	$ 13.72	$ 229.50	$20	16.7	15.3
146	Stage	3	High Bay MH 400	MH400/1	458	1.4	Breaker	2400	3,298	3	C 54 C F 6	F46GHL	351	1.1	Breaker	2,400	2,527	770	0.3	$ 153.77	$ 1,660.50	$300	10.8	8.8
13	Stage	4	S 32 P F 2 (ELE)	F42LL	60	0.2	Breaker	2400	576	4	0	F42SSILL	48	0.2	Breaker	2,400	461	115	0.0	$ 22.99	$ 459.00	$40	20.0	18.2
201	Music	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.2	SW	2400	2,808	13	0	F43SSILL	72	0.9	SW	2,400	2,246	562	0.2	$ 112.10	$ 1,491.75	$130	13.3	12.1
201	Instrument	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2400	3,456	16	0	F43SSILL	72	1.2	SW	2,400	2,765	691	0.3	$ 137.96	$ 1,836.00	$160	13.3	12.1
201	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	SW	1,000	72	18	0.0	$ 4.52	$ 114.75	$10	25.4	23.2
201	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	SW	1,000	72	18	0.0	$ 4.52	$ 114.75	$10	25.4	23.2
201	TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	0	F43SSILL	72	0.1	SW	2,400	173	43	0.0	$ 8.62	$ 114.75	$10	13.3	12.1
201	Corridor	11	T 32 R F 3 (ELE)	F43ILL/2	90	1.0	SW	2600	2,574	11	0	F43SSILL	72	0.8	SW	2,600	2,059	515	0.2	$ 101.30	$ 1,262.25	$110	12.5	11.4
201	Staff TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	0	F43SSILL	72	0.1	SW	2,400	173	43	0.0	$ 8.62	$ 114.75	$10	13.3	12.1
201	Group Instruction	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	2400	432	2	0	F43SSILL	72	0.1	SW	2,400	346	86	0.0	$ 17.25	$ 229.50	$20	13.3	12.1
201	Media Center	22	T 32 R F 3 (ELE)	F43ILL/2	90	2.0	SW	2400	4,752	22	0	F43SSILL	72	1.6	SW	2,400	3,802	950	0.4	$ 189.70	$ 2,524.50	$220	13.3	12.1
25	Media Center	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	2400	202	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	2,400	202	-	0.0	$ -	$ -	$0		#DIV/0!
201	Media Center Storage	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	1000	360	4	0	F43SSILL	72	0.3	SW	1,000	288	72	0.1	$ 18.06	$ 459.00	$40	25.4	23.2
201	S3	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	SW	1,000	72	18	0.0	$ 4.52	$ 114.75	$10	25.4	23.2
	Total	**729**				**56.2**			**129,328**	**729**			**6,483**	**44.3**			**101,790**	**27,538**	**12.0**	**$5,543**	**$90,936**	**$8,970**		
																Demand Savings				**11.9**	**$1,047**			
																kWh Savings				**27,538**	**$4,489**			
																Total savings					**$5,535**		**16.4**	**14.8**

Energy Audit of Magnolia BOE
CHA Project No. 24895
ECM-2 Install Occupancy Sensors

	EXISTING CONDITIONS									RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kW Saved) * ($/kWh)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
13	Gym MER	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	1000	300.0	5	S 32 P F 2 (ELE)	F42LL	60	0.3	NONE	1000	300.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
12	MER	3	1B 35 C F 2 (MAG)	F42EE	72	0.2	SW	1000	216.0	3	1B 35 C F 2 (MAG)	F42EE	72	0.2	NONE	1000	216.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
12	Maintainence Office	2	1B 35 C F 2 (MAG)	F42EE	72	0.1	SW	1800	259.2	2	1B 35 C F 2 (MAG)	F42EE	72	0.1	C-OCC	1100	158.4	100.8	0.0	$16.43	$270.00	$35.00	16.4	14.3
12	Maintainence Storage	3	1B 35 C F 2 (MAG)	F42EE	72	0.2	SW	1000	216.0	3	1B 35 C F 2 (MAG)	F42EE	72	0.2	C-OCC	250	54.0	162.0	0.0	$26.41	$270.00	$35.00	10.2	8.9
13	Maintainence Stair	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	3200	192.0	1	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	3200	192.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
201	Kitchen	11	T 32 R F 3 (ELE)	F43ILL/2	90	1.0	SW	1040	1,029.6	11	T 32 R F 3 (ELE)	F43ILL/2	90	1.0	C-OCC	780	772.2	257.4	0.0	$41.96	$270.00	$35.00	6.4	5.6
201	Kitchen Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1800	162.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1100	99.0	63.0	0.0	$10.27	$270.00	$35.00	26.3	22.9
201	Kitchen Vestibule	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2600	702.0	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	2080	561.6	140.4	0.0	$22.89	$270.00	$35.00	11.8	10.3
201	Kitchen TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1200	108.0	108.0	0.0	$17.60	$270.00	$35.00	15.3	13.3
201	Utility Washroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	250	22.5	67.5	0.0	$11.00	$270.00	$35.00	24.5	21.4
201	S6	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1000	180.0	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	C-OCC	250	45.0	135.0	0.0	$22.01	$270.00	$35.00	12.3	10.7
201	S7	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	250	22.5	67.5	0.0	$11.00	$270.00	$35.00	24.5	21.4
13	Computer Room	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
13	24A	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720.0	5	S 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	1680	504.0	216.0	0.0	$35.21	$270.00	$35.00	7.7	6.7
13	24B	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720.0	5	S 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	1680	504.0	216.0	0.0	$35.21	$270.00	$35.00	7.7	6.7
13	27	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024.0	21	S 32 P F 2 (ELE)	F42LL	60	1.3	C-OCC	1680	2,116.8	907.2	0.0	$147.87	$270.00	$35.00	1.8	1.6
13	26	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024.0	21	S 32 P F 2 (ELE)	F42LL	60	1.3	C-OCC	1680	2,116.8	907.2	0.0	$147.87	$270.00	$35.00	1.8	1.6
13	29	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024.0	21	S 32 P F 2 (ELE)	F42LL	60	1.3	C-OCC	1680	2,116.8	907.2	0.0	$147.87	$270.00	$35.00	1.8	1.6
13	28	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024.0	21	S 32 P F 2 (ELE)	F42LL	60	1.3	C-OCC	1680	2,116.8	907.2	0.0	$147.87	$270.00	$35.00	1.8	1.6
13	31	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024.0	21	S 32 P F 2 (ELE)	F42LL	60	1.3	C-OCC	1680	2,116.8	907.2	0.0	$147.87	$270.00	$35.00	1.8	1.6
13	30	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024.0	21	S 32 P F 2 (ELE)	F42LL	60	1.3	C-OCC	1680	2,116.8	907.2	0.0	$147.87	$270.00	$35.00	1.8	1.6
117	Stair	7	CF 23	CFS23/1	23	0.2	SW	3200	515.2	7	CF 23	CFS23/1	23	0.2	C-OCC	3200	515.2	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
13	2nd Floor Corridor	9	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	S 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$45.77	$270.00	$35.00	5.9	5.1
13	Boys TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144.0	144.0	0.0	$23.47	$270.00	$35.00	11.5	10.0
7	Boys TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
117	Storage	3	CF 23	CFS23/1	23	0.1	SW	1000	69.0	3	CF 23	CFS23/1	23	0.1	C-OCC	250	17.3	51.8	0.0	$8.44	$270.00	$35.00	32.0	27.9
13	Girls TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144.0	144.0	0.0	$23.47	$270.00	$35.00	11.5	10.0
7	Girls TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
65	Storage	1	I 100	I100/1	100	0.1	SW	1000	100.0	1	I 100	I100/1	100	0.1	C-OCC	250	25.0	75.0	0.0	$12.23	$270.00	$35.00	22.1	19.2
117	Janitor's Closet	1	CF 23	CFS23/1	23	0.0	SW	1000	23.0	1	CF 23	CFS23/1	23	0.0	C-OCC	250	5.8	17.3	0.0	$2.81	$270.00	$35.00	96.0	83.6
13	Faculty Room	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720.0	5	S 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	1680	504.0	216.0	0.0	$35.21	$270.00	$35.00	7.7	6.7
7	Men's Faculty TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
7	Women's Faculty TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
13	Corridor	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	468.0	3	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	2080	374.4	93.6	0.0	$15.26	$270.00	$35.00	17.7	15.4
201	Stair	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	3200	864.0	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	3200	864.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
13	Storage	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1000	120.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	250	30.0	90.0	0.0	$14.67	$270.00	$35.00	18.4	16.0
117	Bathroom	1	CF 23	CFS23/1	23	0.0	SW	2400	55.2	1	CF 23	CFS23/1	23	0.0	C-OCC	1200	27.6	27.6	0.0	$4.50	$270.00	$35.00	60.0	52.2
65	Storage	1	I 100	I100/1	100	0.1	SW	1000	100.0	1	I 100	I100/1	100	0.1	C-OCC	250	25.0	75.0	0.0	$12.23	$270.00	$35.00	22.1	19.2
13	Girl's TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144.0	144.0	0.0	$23.47	$270.00	$35.00	11.5	10.0
7	Girls TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
13	17	16	S 32 P F 2 (ELE)	F42LL	60	1.0	SW	2400	2,304.0	16	S 32 P F 2 (ELE)	F42LL	60	1.0	C-OCC	1680	1,612.8	691.2	0.0	$112.67	$270.00	$35.00	2.4	2.1
117	17A	1	CF 23	CFS23/1	23	0.0	SW	2400	55.2	1	CF 23	CFS23/1	23	0.0	C-OCC	1680	38.6	16.6	0.0	$2.70	$270.00	$35.00	100.0	87.1
13	16	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016.0	14	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1680	1,411.2	604.8	0.0	$98.58	$270.00	$35.00	2.7	2.4
13	19	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016.0	14	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1680	1,411.2	604.8	0.0	$98.58	$270.00	$35.00	2.7	2.4
13	18	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016.0	14	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1680	1,411.2	604.8	0.0	$98.58	$270.00	$35.00	2.7	2.4
13	21	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016.0	14	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1680	1,411.2	604.8	0.0	$98.58	$270.00	$35.00	2.7	2.4
13	20	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016.0	14	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1680	1,411.2	604.8	0.0	$98.58	$270.00	$35.00	2.7	2.4
13	23	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016.0	14	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1680	1,411.2	604.8	0.0	$98.58	$270.00	$35.00	2.7	2.4
13	22	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016.0	14	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1680	1,411.2	604.8	0.0	$98.58	$270.00	$35.00	2.7	2.4
13	Corridor	13	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2600	2,028.0	13	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	2080	1,622.4	405.6	0.0	$66.11	$270.00	$35.00	4.1	3.6
13	Corridor	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2600	1,560.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	2080	1,248.0	312.0	0.0	$50.86	$270.00	$35.00	5.3	4.6
13	Boy's TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144.0	144.0	0.0	$23.47	$270.00	$35.00	11.5	10.0
7	Boy's TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
13	15	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016.0	14	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1680	1,411.2	604.8	0.0	$98.58	$270.00	$35.00	2.7	2.4
13	14B	8	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	S 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$56.33	$270.00	$35.00	4.8	4.2
13	Conference Room	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	1200	432.0	6	S 32 P F 2 (ELE)	F42LL	60	0.4	C-OCC	1000	360.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
117	Storage	1	CF 23	CFS23/1	23	0.0	SW	1000	23.0	1	CF 23	CFS23/1	23	0.0	C-OCC	250	5.8	17.3	0.0	$2.81	$270.00	$35.00	96.0	83.6
7	TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
13	Child Study Office	9	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	1800	972.0	9	S 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	1100	594.0	378.0	0.0	$61.61	$270.00	$35.00	4.4	3.8
7	Child Study Office TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
13	Central Office	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1800	432.0	4	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	1100	264.0	168.0	0.0	$27.38	$270.00	$35.00	9.9	8.6
13	Superintendent Office	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1800	432.0	4	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	1100	264.0	168.0	0.0	$27.38	$270.00	$35.00	9.9	8.6
13	Business Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1800	216.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1100	132.0	84.0	0.0	$13.69	$270.00	$35.00	19.7	17.2
13	Corridor	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780.0	5	S 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	2080	624.0	156.0	0.0	$25.43	$270.00	$35.00	10.6	9.2
13	12	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
7	12 TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
13	11	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
13	Vestibule	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	156.0	1	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	2080	124.8	31.2	0.0	$5.09	$270.00	$35.00	53.1	46.2
13	10	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
13	9	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
7	Corridor	6	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.4	SW	2600	936.0	6	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.4	C-OCC	2080	748.8	187.2	0.0	$30.51	$270.00	$35.00	8.8	7.7
13	Corridor	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	468.0	3	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	2080	374.4	93.6	0.0	$15.26	$270.00	$35.00	17.7	15.4
13	4	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
13	3	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
13	2	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
117	Storage	1	CF 23	CFS23/1	23	0.0	SW	1000	23.0	1	CF 23	CFS23/1	23	0.0	C-OCC	250	5.8	17.3	0.0	$2.81	$270.00	$35.00	96.0	83.6
7	Girls TR	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	288.0	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	144.0	144.0	0.0	$23.47	$270.00	$35.00	11.5	10.0
13	1	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
18	Classroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2400	537.6	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1680	376.3	161.3	0.0	$26.29	$270.00	$35.00	10.3	8.9
13	Vestibule	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	2080	249.6	62.4	0.0	$10.17	$270.00	$35.00	26.5	23.1
13	Corridor	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780.0	5	S 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	2080	624.0	156.0	0.0	$25.43	$270.00	$35.00	10.6	9.2
7	Corridor	4	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2600	624.0	4	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	C-OCC	2080	499.2	124.8	0.0	$20.34	$270.00	$35.00	13.3	11.6
18	Cafeteria	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	1600	2,867.2	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	NONE	1600	2,867.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
13	8	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
18	Classroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2400	537.6	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1680	376.3	161.3	0.0	$26.29	$270.00	$35.00	10.3	8.9
7	Boy's TR	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2400	432.0	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	C-OCC	1680	302.4	129.6	0.0	$21.12	$270.00	$35.00	12.8	11.1
65	Janitor's Closet	1	I 100	I100/1	100	0.1	SW	1000	100.0	1	I 100	I100/1	100	0.1	C-OCC	250	25.0	75.0	0.0	$12.23	$270.00	$35.00	22.1	19.2
13	7	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
13	6	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
7	Corridor	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2600	312.0	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	2080	249.6	62.4	0.0	$10.17	$270.00	$35.00	26.5	23.1
13	Corridor	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	2080	249.6	62.4	0.0	$10.17	$270.00	$35.00	26.5	23.1
13	5	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440.0	10	S 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	1680	1,008.0	432.0	0.0	$70.42	$270.00	$35.00	3.8	3.3
7	TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	1200	72.0	72.0	0.0	$11.74	$270.00	$35.00	23.0	20.0
201	Corridor	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,170.0	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2080	936.0	234.0	0.0	$38.14	$270.00	$35.00	7.1	6.2
201	Main Office	8	T 32 R F 3 (ELE)	F43ILL/2	90	0.7	SW	1800	1,296.0	8	T 32 R F 3 (ELE)	F43ILL/2	90	0.7	C-OCC	1100	792.0	504.0	0.0	$82.15	$270.00	$35.00	3.3	2.9
201	Principal Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1800	324.0	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	C-OCC	1100	198.0	126.0	0.0	$20.54	$270.00	$35.00	13.1	11.4
201	Nurse	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	1800	810.0	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	1100	495.0	315.0	0.0	$51.35	$270.00	$35.00	5.3	4.6
201	Nurse TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1200	108.0	108.0	0.0	$17.60	$270.00	$35.00	15.3	13.3
146	Gym / Auditorium	18	High Bay MH 400	MH400/1	458	8.2	Breaker	2600	21,434.4	18	High Bay MH 400	MH400/1	458	8.2	NONE	2600	21,434.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
13	Girls Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	800	144.0	3	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	250	45.0	99.0	0.0	$16.14	$270.00	$35.00	16.7	14.6
13	Boys Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	800	144.0	3	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	250	45.0	99.0	0.0	$16.14	$270.00	$35.00	16.7	14.6
13	S5	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1000	120.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	250	30.0	90.0	0.0	$14.67	$270.00	$35.00	18.4	16.0
201	PE Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1800	324.0	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	C-OCC	1100	198.0	126.0	0.0	$20.54	$270.00	$35.00	13.1	11.4
146	Stage	3	High Bay MH 400	MH400/1	458	1.4	Breaker	2400	3,297.6	3	High Bay MH 400	MH400/1	458	1.4	NONE	2400	3,297.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
13	Stage	4	S 32 P F 2 (ELE)	F42LL	60	0.2	Breaker	2400	576.0	4	S 32 P F 2 (ELE)	F42LL	60	0.2	NONE	2400	576.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
201	Music	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.2	SW	2400	2,808.0	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.2	C-OCC	1680	1,965.6	842.4	0.0	$137.31	$270.00	$35.00	2.0	1.7
201	Instrument	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2400	3,456.0	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	1680	2,419.2	1,036.8	0.0	$169.00	$270.00	$35.00	1.6	1.4
201	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	250	22.5	67.5	0.0	$11.00	$270.00	$35.00	24.5	21.4
201	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	250	22.5	67.5	0.0	$11.00	$270.00	$35.00	24.5	21.4
201	TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1200	108.0	108.0	0.0	$17.60	$270.00	$35.00	15.3	13.3
201	Corridor	11	T 32 R F 3 (ELE)	F43ILL/2	90	1.0	SW	2600	2,574.0	11	T 32 R F 3 (ELE)	F43ILL/2	90	1.0	C-OCC	2080	2,059.2	514.8	0.0	$83.91	$270.00	$35.00	3.2	2.8
201	Staff TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1200	108.0	108.0	0.0	$17.60	$270.00	$35.00	15.3	13.3
201	Group Instruction	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	2400	432.0	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	C-OCC	1680	302.4	129.6	0.0	$21.12	$270.00	$35.00	12.8	11.1
201	Media Center	22	T 32 R F 3 (ELE)	F43ILL/2	90	2.0	SW	2400	4,752.0	22	T 32 R F 3 (ELE)	F43ILL/2	90	2.0	C-OCC	1680	3,326.4	1,425.6	0.0	$232.37	$270.00	$35.00	1.2	1.0
25	Media Center	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	2400	201.6	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	C-OCC	1680	141.1	60.5	0.0	$9.86	$270.00	$35.00	27.4	23.8
201	Media Center Storage	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	1000	360.0	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	C-OCC	250	90.0	270.0	0.0	$44.01	$270.00	$35.00	6.1	5.3
201	S3	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	250	22.5	67.5	0.0	$11.00	$270.00	$35.00	24.5	21.4
	Total	**729**				**56.2**			**129,238**	**728**				**56**			**98,992**	**30,336**	**0**	**4,945**	**$29,970**	**3,885**		
																	Demand Savings			**-0.1**	**-$8**			
																	kWh Savings			**30,246**	**$4,930**			
																	Total Savings				**$4,922**		**6.1**	**5.3**

Energy Audit of Magnolia BOE
CHA Project No. 24895
ECM-3 Lighting Replacements with Occupancy Sensors

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
Field Code	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
13	Gym MER	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	1000	300	5	0	F42SSILL	48	0.2	NONE	1,000	240	60	0.1	$ 15.05	$ 573.75	$ 50	38.1	34.8
12	MER	3	1B 35 C F 2 (MAG)	F42EE	72	0.2	SW	1000	216	3	1B 35 C F 2	F42SSILL	48	0.1	NONE	1,000	144	72	0.1	$ 18.06	$ 344.25	$ 30	19.1	17.4
12	Maintainence Office	2	1B 35 C F 2 (MAG)	F42EE	72	0.1	SW	1800	259	2	1B 35 C F 2	F42SSILL	48	0.1	C-OCC	1,100	106	154	0.0	$ 29.25	$ 499.50	$ 55	17.1	15.2
12	Maintainence Storage	3	1B 35 C F 2 (MAG)	F42EE	72	0.2	SW	1000	216	3	1B 35 C F 2	F42SSILL	48	0.1	C-OCC	250	36	180	0.1	$ 35.66	$ 614.25	$ 65	17.2	15.4
13	Maintainence Stair	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	3200	192	1	0	F42SSILL	48	0.0	C-OCC	3,200	154	38	0.0	$ 7.31	$ 384.75	$ 45	52.6	46.5
201	Kitchen	11	T 32 R F 3 (ELE)	F43ILL/2	90	1.0	SW	1040	1,030	11	0	F43SSILL	72	0.8	C-OCC	780	618	412	0.2	$ 84.52	$ 1,532.25	$ 145	18.1	16.4
201	Kitchen Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1800	162	1	0	F43SSILL	72	0.1	C-OCC	1,100	79	83	0.0	$ 15.08	$ 384.75	$ 45	25.5	22.5
201	Kitchen Vestibule	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2600	702	3	0	F43SSILL	72	0.2	C-OCC	2,080	449	253	0.1	$ 45.94	$ 614.25	$ 65	13.4	12.0
201	Kitchen TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	0	F43SSILL	72	0.1	C-OCC	1,200	86	130	0.0	$ 22.71	$ 384.75	$ 45	16.9	15.0
201	Utility Washroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	C-OCC	250	18	72	0.0	$ 13.32	$ 384.75	$ 45	28.9	25.5
201	S6	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1000	180	2	0	F43SSILL	72	0.1	C-OCC	250	36	144	0.0	$ 26.63	$ 499.50	$ 55	18.8	16.7
201	S7	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	C-OCC	250	18	72	0.0	$ 13.32	$ 384.75	$ 45	28.9	25.5
13	Computer Room	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
13	24A	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	0	F42SSILL	48	0.2	C-OCC	1,680	403	317	0.1	$ 56.91	$ 843.75	$ 85	14.8	13.3
13	24B	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	0	F42SSILL	48	0.2	C-OCC	1,680	403	317	0.1	$ 56.91	$ 843.75	$ 85	14.8	13.3
13	27	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	C-OCC	1,680	1,693	1,331	0.3	$ 239.02	$ 2,679.75	$ 245	11.2	10.2
13	26	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	C-OCC	1,680	1,693	1,331	0.3	$ 239.02	$ 2,679.75	$ 245	11.2	10.2
13	29	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	C-OCC	1,680	1,693	1,331	0.3	$ 239.02	$ 2,679.75	$ 245	11.2	10.2
13	28	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	C-OCC	1,680	1,693	1,331	0.3	$ 239.02	$ 2,679.75	$ 245	11.2	10.2
13	31	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	C-OCC	1,680	1,693	1,331	0.3	$ 239.02	$ 2,679.75	$ 245	11.2	10.2
13	30	21	S 32 P F 2 (ELE)	F42LL	60	1.3	SW	2400	3,024	21	0	F42SSILL	48	1.0	C-OCC	1,680	1,693	1,331	0.3	$ 239.02	$ 2,679.75	$ 245	11.2	10.2
117	Stair	7	CF 23	CFS23/1	23	0.2	SW	3200	515	7	CF 23	CFS23/1	23	0.2	C-OCC	3,200	515	-	0.0	$ -	$ 270.00	$ 35		
13	2nd Floor Corridor	9	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	0	F42SSILL	48	0.4	C-OCC	2,080	899	505	0.1	$ 91.87	$ 1,302.75	$ 125	14.2	12.8
13	Boys TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	C-OCC	1,200	115	173	0.0	$ 30.27	$ 499.50	$ 55	16.5	14.7
7	Boys TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
117	Storage	3	CF 23	CFS23/1	23	0.1	SW	1000	69	3	CF 23	CFS23/1	23	0.1	C-OCC	250	17	52	0.0	$ 8.44	$ 270.00	$ 35	32.0	27.9
13	Girls TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	C-OCC	1,200	115	173	0.0	$ 30.27	$ 499.50	$ 55	16.5	14.7
7	Girls TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
65	Storage	1	I 100	I100/1	100	0.1	SW	1000	100	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	250	7	93	0.1	$ 21.61	$ 310.50	$ 35	14.4	12.7
117	Janitor's Closet	1	CF 23	CFS23/1	23	0.0	SW	1000	23	1	CF 23	CFS23/1	23	0.0	C-OCC	250	6	17	0.0	$ 2.81	$ 270.00	$ 35	96.0	83.6
13	Faculty Room	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	0	F42SSILL	48	0.2	C-OCC	1,680	403	317	0.1	$ 56.91	$ 843.75	$ 85	14.8	13.3
7	Men's Faculty TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
7	Women's Faculty TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
13	Corridor	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	468	3	0	F42SSILL	48	0.1	C-OCC	2,080	300	168	0.0	$ 30.62	$ 614.25	$ 65	20.1	17.9
201	Stair	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	3200	864	3	0	F43SSILL	72	0.2	C-OCC	3,200	691	173	0.1	$ 32.91	$ 614.25	$ 65	18.7	16.7
13	Storage	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	0	F42SSILL	48	0.1	C-OCC	250	24	96	0.0	$ 17.76	$ 499.50	$ 55	28.1	25.0
117	Bathroom	1	CF 23	CFS23/1	23	0.0	SW	2400	55	1	CF 23	CFS23/1	23	0.0	C-OCC	1,200	28	28	0.0	$ 4.50	$ 270.00	$ 35	60.0	52.2
65	Storage	1	I 100	I100/1	100	0.1	SW	1000	100	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	250	7	93	0.1	$ 21.61	$ 310.50	$ 35	14.4	12.7
13	Girl's TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	C-OCC	1,200	115	173	0.0	$ 30.27	$ 499.50	$ 55	16.5	14.7
7	Girls TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
13	17	16	S 32 P F 2 (ELE)	F42LL	60	1.0	SW	2400	2,304	16	0	F42SSILL	48	0.8	C-OCC	1,680	1,290	1,014	0.2	$ 182.11	$ 2,106.00	$ 195	11.6	10.5
117	17A	1	CF 23	CFS23/1	23	0.0	SW	2400	55	1	CF 23	CFS23/1	23	0.0	C-OCC	1,680	39	17	0.0	$ 2.70	$ 270.00	$ 35	100.0	87.1
13	16	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	C-OCC	1,680	1,129	887	0.2	$ 159.34	$ 1,876.50	$ 175	11.8	10.7
13	19	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	C-OCC	1,680	1,129	887	0.2	$ 159.34	$ 1,876.50	$ 175	11.8	10.7
13	18	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	C-OCC	1,680	1,129	887	0.2	$ 159.34	$ 1,876.50	$ 175	11.8	10.7
13	21	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	C-OCC	1,680	1,129	887	0.2	$ 159.34	$ 1,876.50	$ 175	11.8	10.7
13	20	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	C-OCC	1,680	1,129	887	0.2	$ 159.34	$ 1,876.50	$ 175	11.8	10.7
13	23	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	C-OCC	1,680	1,129	887	0.2	$ 159.34	$ 1,876.50	$ 175	11.8	10.7
13	22	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	C-OCC	1,680	1,129	887	0.2	$ 159.34	$ 1,876.50	$ 175	11.8	10.7
13	Corridor	13	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2600	2,028	13	0	F42SSILL	48	0.6	C-OCC	2,080	1,298	730	0.2	$ 132.71	$ 1,761.75	$ 165	13.3	12.0
13	Corridor	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2600	1,560	10	0	F42SSILL	48	0.5	C-OCC	2,080	998	562	0.1	$ 102.08	$ 1,417.50	$ 135	13.9	12.6
13	Boy's TR	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	C-OCC	1,200	115	173	0.0	$ 30.27	$ 499.50	$ 55	16.5	14.7
7	Boy's TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
13	15	14	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	2,016	14	0	F42SSILL	48	0.7	C-OCC	1,680	1,129	887	0.2	$ 159.34	$ 1,876.50	$ 175	11.8	10.7
13	14B	8	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	0	F42SSILL	48	0.4	C-OCC	1,680	645	507	0.1	$ 91.05	$ 1,188.00	$ 115	13.0	11.8
13	Conference Room	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	1200	432	6	0	F42SSILL	48	0.3	C-OCC	1,000	288	144	0.1	$ 29.80	$ 958.50	$ 95	32.2	29.0
117	Storage	1	CF 23	CFS23/1	23	0.0	SW	1000	23	1	CF 23	CFS23/1	23	0.0	C-OCC	250	6	17	0.0	$ 2.81	$ 270.00	$ 35	96.0	83.6
7	TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
13	Child Study Office	9	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	1800	972	9	0	F42SSILL	48	0.4	C-OCC	1,100	475	497	0.1	$ 90.47	$ 1,302.75	$ 125	14.4	13.0
7	Child Study Office TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
13	Central Office	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1800	432	4	0	F42SSILL	48	0.2	C-OCC	1,100	211	221	0.0	$ 40.21	$ 729.00	$ 75	18.1	16.3
13	Superintendent Office	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1800	432	4	0	F42SSILL	48	0.2	C-OCC	1,100	211	221	0.0	$ 40.21	$ 729.00	$ 75	18.1	16.3
13	Business Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1800	216	2	0	F42SSILL	48	0.1	C-OCC	1,100	106	110	0.0	$ 20.10	$ 499.50	$ 55	24.8	22.1
13	Corridor	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780	5	0	F42SSILL	48	0.2	C-OCC	2,080	499	281	0.1	$ 51.04	$ 843.75	$ 85	16.5	14.9
13	12	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
7	12 TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
13	11	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
13	Vestibule	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	156	1	0	F42SSILL	48	0.0	C-OCC	2,080	100	56	0.0	$ 10.21	$ 384.75	$ 45	37.7	33.3
13	10	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
13	9	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
7	Corridor	6	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.4	SW	2600	936	6	2T 17 R F 2 (ELE)	F22ILL	33	0.2	C-OCC	2,080	412	524	0.2	$ 99.67	$ 918.00	$ 95	9.2	8.3
13	Corridor	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	468	3	0	F42SSILL	48	0.1	C-OCC	2,080	300	168	0.0	$ 30.62	$ 614.25	$ 65	20.1	17.9
13	4	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
13	3	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
13	2	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
117	Storage	1	CF 23	CFS23/1	23	0.0	SW	1000	23	1	CF 23	CFS23/1	23	0.0	C-OCC	250	6	17	0.0	$ 2.81	$ 270.00	$ 35	96.0	83.6
7	Girls TR	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	288	2	2T 17 R F 2 (ELE)	F22ILL	33	0.1	C-OCC	1,200	79	209	0.1	$ 38.78	$ 486.00	$ 55	12.5	11.1
13	1	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
18	Classroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2400	538	2	0	F44SSILL	96	0.2	C-OCC	1,680	323	215	0.0	$ 37.86	$ 553.50	$ 55	14.6	13.2
13	Vestibule	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	0	F42SSILL	48	0.1	C-OCC	2,080	200	112	0.0	$ 20.42	$ 499.50	$ 55	24.5	21.8
13	Corridor	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780	5	0	F42SSILL	48	0.2	C-OCC	2,080	499	281	0.1	$ 51.04	$ 843.75	$ 85	16.5	14.9
7	Corridor	4	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2600	624	4	2T 17 R F 2 (ELE)	F22ILL	33	0.1	C-OCC	2,080	275	349	0.1	$ 66.45	$ 702.00	$ 75	10.6	9.4
18	Cafeteria	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	1600	2,867	16	0	F44SSILL	96	1.5	NONE	1,600	2,458	410	0.3	$ 89.25	$ 2,268.00	$ 160	25.4	23.6
13	8	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
18	Classroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2400	538	2	0	F44SSILL	96	0.2	C-OCC	1,680	323	215	0.0	$ 37.86	$ 553.50	$ 55	14.6	13.2
7	Boy's TR	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2400	432	3	2T 17 R F 2 (ELE)	F22ILL	33	0.1	C-OCC	1,680	166	266	0.1	$ 50.42	$ 594.00	$ 65	11.8	10.5
65	Janitor's Closet	1	I 100	I100/1	100	0.1	SW	1000	100	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	250	7	93	0.1	$ 21.61	$ 310.50	$ 35	14.4	12.7
13	7	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
13	6	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
7	Corridor	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2600	312	2	2T 17 R F 2 (ELE)	F22ILL	33	0.1	C-OCC	2,080	137	175	0.1	$ 33.22	$ 486.00	$ 55	14.6	13.0
13	Corridor	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	0	F42SSILL	48	0.1	C-OCC	2,080	200	112	0.0	$ 20.42	$ 499.50	$ 55	24.5	21.8
13	5	10	S 32 P F 2 (ELE)	F42LL	60	0.6	SW	2400	1,440	10	0	F42SSILL	48	0.5	C-OCC	1,680	806	634	0.1	$ 113.82	$ 1,417.50	$ 135	12.5	11.3
7	TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,200	40	104	0.0	$ 19.39	$ 378.00	$ 45	19.5	17.2
201	Corridor	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,170	5	0	F43SSILL	72	0.4	C-OCC	2,080	749	421	0.1	$ 76.56	$ 843.75	$ 85	11.0	9.9
201	Main Office	8	T 32 R F 3 (ELE)	F43ILL/2	90	0.7	SW	1800	1,296	8	0	F43SSILL	72	0.6	C-OCC	1,100	634	662	0.1	$ 120.62	$ 1,188.00	$ 115	9.8	8.9
201	Principal Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1800	324	2	0	F43SSILL	72	0.1	C-OCC	1,100	158	166	0.0	$ 30.16	$ 499.50	$ 55	16.6	14.7
201	Nurse	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	1800	810	5	0	F43SSILL	72	0.4	C-OCC	1,100	396	414	0.1	$ 75.39	$ 843.75	$ 85	11.2	10.1
201	Nurse TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	0	F43SSILL	72	0.1	C-OCC	1,200	86	130	0.0	$ 22.71	$ 384.75	$ 45	16.9	15.0
146	Gym / Auditorium	18	High Bay MH 400	MH400/1	458	8.2	Breaker	2600	21,434	18	C 54 C F 6	F46GHL	351	6.3	NONE	2,600	16,427	5,008	1.9	$ 985.42	$ 9,963.00	$ 1,800	10.1	8.3
13	Girls Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	800	144	3	0	F42SSILL	48	0.1	C-OCC	250	36	108	0.0	$ 20.77	$ 614.25	$ 65	29.6	26.4
13	Boys Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	800	144	3	0	F42SSILL	48	0.1	C-OCC	250	36	108	0.0	$ 20.77	$ 614.25	$ 65	29.6	26.4
13	S5	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	0	F42SSILL	48	0.1	C-OCC	250	24	96	0.0	$ 17.76	$ 499.50	$ 55	28.1	25.0
201	PE Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	1800	324	2	0	F43SSILL	72	0.1	C-OCC	1,100	158	166	0.0	$ 30.16	$ 499.50	$ 55	16.6	14.7
146	Stage	3	High Bay MH 400	MH400/1	458	1.4	Breaker	2400	3,298	3	C 54 C F 6	F46GHL	351	1.1	NONE	2,400	2,527	770	0.3	$ 153.77	$ 1,660.50	$ 300	10.8	8.8
13	Stage	4	S 32 P F 2 (ELE)	F42LL	60	0.2	Breaker	2400	576	4	0	F42SSILL	48	0.2	NONE	2,400	461	115	0.0	$ 22.99	$ 459.00	$ 40	20.0	18.2
201	Music	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.2	SW	2400	2,808	13	0	F43SSILL	72	0.9	C-OCC	1,680	1,572	1,236	0.2	$ 221.94	$ 1,761.75	$ 165	7.9	7.2
201	Instrument	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2400	3,456	16	0	F43SSILL	72	1.2	C-OCC	1,680	1,935	1,521	0.3	$ 273.16	$ 2,106.00	$ 195	7.7	7.0
201	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	C-OCC	250	18	72	0.0	$ 13.32	$ 384.75	$ 45	28.9	25.5
201	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	C-OCC	250	18	72	0.0	$ 13.32	$ 384.75	$ 45	28.9	25.5
201	TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	0	F43SSILL	72	0.1	C-OCC	1,200	86	130	0.0	$ 22.71	$ 384.75	$ 45	16.9	15.0
201	Corridor	11	T 32 R F 3 (ELE)	F43ILL/2	90	1.0	SW	2600	2,574	11	0	F43SSILL	72	0.8	C-OCC	2,080	1,647	927	0.2	$ 168.43	$ 1,532.25	$ 145	9.1	8.2
201	Staff TR	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	0	F43SSILL	72	0.1	C-OCC	1,200	86	130	0.0	$ 22.71	$ 384.75	$ 45	16.9	15.0
201	Group Instruction	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	2400	432	2	0	F43SSILL	72	0.1	C-OCC	1,680	242	190	0.0	$ 34.15	$ 499.50	$ 55	14.6	13.0
201	Media Center	22	T 32 R F 3 (ELE)	F43ILL/2	90	2.0	SW	2400	4,752	22	0	F43SSILL	72	1.6	C-OCC	1,680	2,661	2,091	0.4	$ 375.60	$ 2,794.50	$ 255	7.4	6.8
25	Media Center	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	2400	202	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	C-OCC	1,680	141	60	0.0	$ 9.86	$ 270.00	$ 35	27.4	23.8
201	Media Center Storage	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	1000	360	4	0	F43SSILL	72	0.3	C-OCC	250	72	288	0.1	$ 53.27	$ 729.00	$ 75	13.7	12.3
201	S3	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	1000	90	1	0	F43SSILL	72	0.1	C-OCC	250	18	72	0.0	$ 13.32	$ 384.75	$ 45	28.9	25.5
S	Total	729				56.2			129,238	728				44.3			77,958		12.0	9,428	120,906	$12,855		
S																	Demand Savings			11.9	$1,047			
S																	kWh Savings			51,281	$8,359			
S																	Total Savings				$9,405		12.9	11.5

APPENDIX D

New Jersey Board of Public Utilities Incentives

i. **Smart Start**

ii. **Direct Install**

iii. **Pay for Performance (P4P)**

iv. **Energy Savings Improvement Plan (ESIP)**

I. SMART START

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

PROGRAMS

NJ SMARTSTART BUILDINGS

EQUIPMENT INCENTIVES

APPLICATION FORMS

TOOLS AND RESOURCES

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PILOT

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

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NJ SmartStart Buildings

Program Overview

New Jersey SmartStart BUILDINGS®

With New Jersey SmartStart Buildings ...

... A smart start now means better performance later! Whether you're starting a commercial or industrial project from the ground up, renovating existing space, or upgrading equipment, you have unique opportunities to upgrade the energy efficiency of the project.

New Jersey SmartStart Buildings can provide a range of support — at no cost to you — to yield substantial energy savings, both now and for the future. Learn more about:

- Project Categories
- Custom Measures
- Incentives for Qualifying Equipment and Projects
- Program Terms and Conditions
- Find a Trade Ally

Please note: pre-approval is required for almost all energy efficiency incentives. This means you must submit an application form (and applicable worksheets) and receive an approval letter from the program before any equipment is installed (click here for complete Terms and Conditions.) Upon receipt of an approval letter, you may proceed to install the equipment listed on your approved application. Equipment installed prior to the date of the approval letter is not eligible for an incentive. **Any customer and/or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Getting Started

Submit your project application form as soon as you know you will be doing a construction project, or replacing/adding equipment.

Smart-Growth Eligibility: *Check to make sure your project is eligible for incentives.*

Incentives for new construction are available only for projects in areas designated for growth in the NJ State Development and Redevelopment Plan. Public school (K-12) new construction projects are exempted from this restriction and are eligible for incentives throughout the State.

Customers, or their trade allies, can determine if a location is in a designated growth area by referring to the Smart Growth Site Evaluator Tool available from the HMFA website. Contact a program representative if you are uncertain about project eligibility. The Smart Growth policies will be implemented consistent with Board Orders as described more fully in the C&I Operational Procedure Manual.

Apply for pre-approval by submitting an application for the type of equipment you have chosen to install. The application should be accompanied by a related worksheet, where applicable, and a manufacturer's specification sheet (refer to the specific program requirements on the back of the application for specs needed for your project) for the equipment you are planning to install. (Program representatives will review your application package and approve it, reject it, and/or advise you of upgrades in equipment that will save energy costs and/or increase your incentives.)

Support for Custom Energy-Efficiency Measures

Custom measures allows program participants the opportunity to receive an incentive for unique energy-efficiency measures that are not on the prescriptive equipment incentive list, but are project/facility specific.

Incentives for Qualifying Equipment and Projects

Financial incentives are available for large and small projects. These incentives offset some — or maybe even all! — of the added cost to purchase qualifying energy-efficient equipment, which provides significant long-term energy savings. Ranges of incentives are available for qualifying equipment (depending on type, size, and efficiency) in several categories.

Find out more about equipment incentives!

For specific details on equipment requirements and financial incentives, including incentives for equipment not listed here, contact a program representative. Annual financial incentives may be

Program Updates

Notice of 2013 Changes to C&I Programs

Warranty and Lease Terms for CHP/Fuel Cells Increased to 10 Years

Large Combined Heat & Power/Fuel Cell Program Update

Board Order - Standby Charges for Distributed Generation Customers

Other updates posted.

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Equipment Incentives

More reasons for a smart start on your next project!

New Jersey SmartStart Buildings provides **financial incentives for qualifying equipment**. These incentives were developed to help our customers offset some of the added cost to purchase qualifying energy-efficient equipment, which provides significant long-term energy savings. A wide range of incentives are available for qualifying equipment (depending on type, size and efficiency).

Listed below are the types of qualifying equipment and ranges of incentives. For details on equipment requirements and full listings of incentives, refer to the **online application forms**.

Please note that almost all equipment incentives require pre-approval before equipment is installed. (**click for exceptions**)To start the pre-approval process, submit an Equipment Application, and appropriate Equipment Worksheets, for the type or types of equipment you are planning to install along with equipment specification sheets (refer to the specific program requirements on the back of the application for specifications needed for your project) and a current utility bill(s).

In order to be eligible to receive financial incentives under this Program, Applicants must receive electric and/or gas service from one of the regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

Electric Chillers

- Water-cooled chillers ($12 - $170 per ton)
- Air-cooled chillers ($8 - $52 per ton)

Gas Cooling

- Gas absorption chillers ($185-$450 per ton)
- Gas Engine-Driven Chillers (Calculated through Custom Measure Path)

Desiccant Systems ($1.00 per cfm - gas or electric)

Electric Unitary HVAC

- Unitary AC and split systems ($73 - $92 per ton)
- Air-to-air heat pumps ($73 - $92 per ton)
- Water-source heat pumps ($81 per ton)
- Packaged terminal AC & HP ($65 per ton)
- Central DX AC Systems ($40 - $72 per ton)
- Dual Enthalpy Economizer Controls ($250)
- Occupancy Controlled Thermostats ($75 each)

Ground Source Heat Pumps

- Closed Loop ($450-750 per ton)

Gas Heating

- Gas-fired boilers < 300 MBH ($300 per unit)
- Gas-fired boilers ≥ 300 MBH - 1500 MBH ($1.75 per MBH)
- Gas-fired boilers ≥ 1500 MBH - ≤ 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

Program Updates

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- Board Order - Standby Charges for Distributed Generation Customers

Other updates posted.

Featured Success Story

Mannington Mills:

NJ SmartStart Buildings custom measures case study presented at Globalcon Conference

Applications and Brochures

Download the latest program materials.

e-Newsletter SIGN UP TODAY!

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II. DIRECT INSTALL

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

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Direct Install - Steps to Participation

New Jersey SmartStart BUILDINGS

NEW JERSEY'S CLEAN ENERGY PROGRAM DIRECT Install

SIX SIMPLE STEPS TO PARTICIPATION

CONTACT THE PARTICIPATING CONTRACTOR IN YOUR AREA

Identify the contractor assigned and trained to provide Direct Install services in the county where your project is located. Using the contact information provided, call or send an e-mail to the participating contractor to discuss your project. The contractor will schedule an energy assessment and work with you to complete the program application and participation agreement.

If you're unable to contact the participating contractor or have questions, you may contact us at 866-NJSMART or send an e-mail to DirectInstall@NJCleanEnergy.com..

REVIEW RESULTS

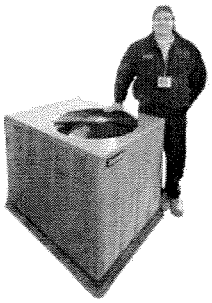
After the energy assessment, the contractor will review the results with you, including what measures qualify and your share of the project cost.

MOVE FORWARD

You will sign a scope of work document to proceed with implementation of qualifying measures.

ARRANGE INSTALLATION

You and the participating contractor will set a convenient start date for the installation.



CONFIRM INSTALLATION

Once the participating contractor completes the installation, you accept the work by signing a project completion form.

COMPLETE TRANSACTION

You pay the participating contractor your share of the project cost and New Jersey's Clean Energy Program pays the rest.

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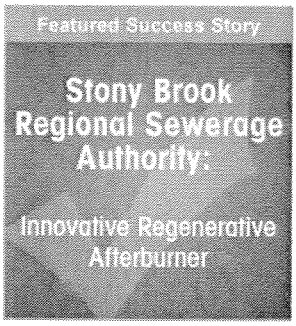

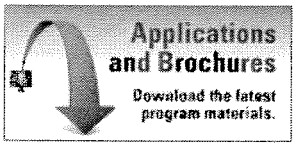

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III. PAY FOR PERFORMANCE (P4P)

New Jersey's Clean Energy PROGRAM™
Your Power to Save
njcleanenergy.com

New Jersey SmartStart BUILDINGS®

BPU

2012 PAY FOR PERFORMANCE PROGRAM
Existing Buildings Incentive Structure

Incentive #1: Energy Reduction Plan

Incentive Amount: ..... **$0.10 per sq ft**
Minimum Incentive: **$5,000**
Maximum Incentive:: ..... **$50,000 or 50% of facility annual energy cost (whichever is less)**

This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP) and is paid upon ERP approval. Incentive is contingent on implementation of recommended measures outlined in the ERP.

Incentive #2: Installation of Recommended Measures

Minimum Performance Target: **15%**

Electric Incentives

Base Incentive based on 15% savings: ..... **$0.09 per projected kWh saved**
For each % over 15% add: ..... **$0.005 per projected kWh saved**
Maximum Incentive: ..... **$0.11 per projected kWh saved**

Gas Incentives

Base Incentive based on 15% savings: ..... **$0.90 per projected Therm saved**
For each % over 15% add: ..... **$0.05 per projected Therm saved**
Maximum Incentive: ..... **$1.25 per projected Therm saved**

Incentive Cap: ..... **25% of total project cost**

This incentive is based on projected energy savings outlined in the ERP. Incentive is paid upon successful installation of recommended measures.

Incentive #3: Post-Construction Benchmarking Report

Minimum Performance Target: **15%**

Electric Incentives

Base Incentive based on 15% savings: ..... **$0.09 per actual kWh saved**
For each % over 15% add: ..... **$0.005 per actual kWh saved**
Maximum Incentive: ..... **$0.11 per actual kWh saved**

Gas Incentives

Base Incentive based on 15% savings: ..... **$0.90 per actual Therm saved**
For each % over 15% add: ..... **$0.05 per actual Therm saved**
Maximum Incentive: ..... **$1.25 per actual Therm saved**

Incentive Cap: ..... **25% of total project cost**

This incentive will be released upon submittal of a Post-Construction Benchmarking Report that verifies that the level of savings actually achieved by the installed measures meets or exceeds the minimum performance threshold. To validate the savings and achievement of the Energy Target, the EPA Portfolio Manager shall be used. Savings should be rounded to the nearest percent. Total value of Incentive #2 and Incentive #3 may not exceed 50% of the total project cost. Incentives will be limited to $1 million per gas and electric account per building; maximum of $2 million per project. See Participation Agreement for details.

IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

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Energy Savings Improvement Program

A new State law allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. Under the recently enacted Chapter 4 of the Laws of 2009 (the law), the "Energy Savings Improvement Program" (ESIP), provides all government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.

This Local Finance Notice outlines how local governments can develop and implement an ESIP for their facilities. Below are two sample RFPs:

Local Government
School Districts (K-12)

The Board also adopted protocols to measure energy savings.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs. Local units considering an ESIP should carefully review the Local Finance Notice, the law, and consult with qualified professionals to determine how they should approach the task.

FIRST STEP – ENERGY AUDIT

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. As explained in the Local Finance Notice, this may be done internally if an agency has qualified staff to conduct the audit. If not, the audit must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

Pursuing a Local Government Energy Audit through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach - and it's free. **Incentives provide 100% of the cost of the audit.**

ENERGY REDUCTION PLANS

If you have an ESIP plan you would like to submit to the Board of Public Utilities, please email it to ESIP@bpu.state.nj.us. Please limit the file size to 3MB (or break it into smaller files).

Frankford Township School District
Northern Hunterdon-Voorhees Regional High School
Manalapan Township ***(180 MB** - Right Click, Save As)*

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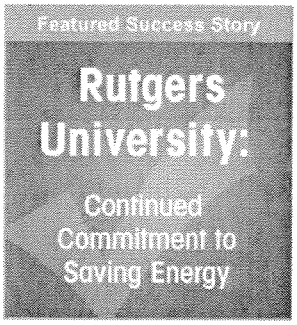

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new jersey department of community affairs
people places progress
division of local government services

LFN 2011-17

June 16, 2011

Local Finance Notice

Chris Christie, *Governor* | Kim Guadagno, *Lt. Governor* | Lori Grifa, *Commissioner* | Thomas H. Neff, *Director*

Update on Implementing Energy Savings Improvement Programs

This Local Finance Notice provides guidance concerning Energy Savings Improvement Program (ESIP) matters that affect local units covered under the Local Public Contracts Law (LPCL, N.J.S.A. 40A:11) and the Public School Contracts Law (PSCL, N.J.S.A. 18A:18A).

The Notice covers a model ESCO (Energy Services Company) Request for Proposal document and provides information on using the "Do-It-Yourself" process for implementing an ESIP. This Notice supplements Local Finance Notice 2009-11 concerning ESIPs.

Model ESCO Request for Proposal Document

General Issues

The Division of Local Government Services and the Board of Public Utilities have completed development of a model ESCO Request for Proposal Document. It is designed to assist all organizations (contracting units) covered by the LPCL and PSCL hire an energy services company (ESCO) to develop and implement an Energy Savings Plan (ESP) as part of an Energy Savings Improvement Program as authorized under N.J.S.A. 40A:11-4.6 and 18A:18A-4.6.

Specifically, the document serves as the starting point for these government agencies to select an ESCO through the competitive contracting procedure (N.J.S.A. 40A:11-4.1 et seq. and 18A:18A-4.1 et seq.).

Notwithstanding the efforts of the State agencies to ensure that the RFP is consistent with all relevant procurement procedures, laws, and regulations, there are several issues contracting unit personnel should keep in mind:

1) Local legal advisors should review the document to ensure it is consistent with any allowable local practices and legal considerations.
2) The individual responsible for managing the project should review the entire RFP in order to be able to answer questions and ensure the document meets local needs.
3) Forms have been carefully designed to meet the need of this specific process. Care should be taken if proposed forms are removed and replaced with ones normally used by the contracting unit.

Contact Information

Director's Office
V. 609.292.6613
F. 609.292.9073

Local Government Research
V. 609.292.6110
F. 609.292.9073

Financial Regulation and Assistance
V. 609.292.4806
F. 609.984.7388

Local Finance Board
V. 609.292.0479
F. 609.633.6243

Local Management Services
V. 609.292.7842
F. 609.633.6243

Authority Regulation
V. 609.984.0132
F. 609.984.7388

Mail and Delivery
101 South Broad St.
PO Box 803
Trenton, New Jersey
08625-0803
Web: www.nj.gov/dca/lgs
E-mail: dlgs@dca.state.nj.us

Distribution
Municipal and Freeholder Clerks
Municipal and County Chief Financial Officers
Local Authority and Fire District Officials
School Business Administrators
Local Procurement Officials

The RFP also uses a formal process for potential proposers to submit questions and requests for clarifications. Appendix B is a form for the submission of these requests and is referred to throughout the text.

Contracting units are also reminded the Competitive Contracting process does not allow for negotiating proposals. While legal elements of the contract (project development agreement) may require legal determinations and modifications, the process does not allow for negotiation of price or related substantive elements and any element that would have provided less than a level playing field for proposers.

Contracting units are also cautioned that setting qualification standards that arbitrarily limit competition is inconsistent with public bidding requirements.

Office of State Comptroller Filing: Contracting units are also reminded of their obligations to meet State Comptroller requirements for public contracts. In accordance with N.J.S.A 52:15C-10, contracting units must notify OSC as early as practicable, but no later than 30 days before advertisement, of any negotiation or solicitation of a contract that may exceed $10 million. Contracting units must also provide post-award notification for any contract for an amount exceeding $2 million. Notification must be given within 20 days of the award.

Substantive Edits:

Several sections are highlighted in green. These sections should be carefully edited to meet contracting unit needs. This has important application to evaluation criteria in Section D. Once finalized, the green highlight should be removed.

Section B-16; Insurance should be reviewed by the contracting unit's Risk Management professionals to be sure the standards are appropriate to the contracting unit and the work to be done.

The following Sections also require local decisions and editing:

- A-3: # of copies of proposal and # of CDs to be submitted
- A-4: Web posting address, if desired
- A-5: If extra credit is to be provided on evaluation scoring for attending site walk through
- B-11: Delete LPCL or PSCL section as appropriate
- B-34: Use only if PSCL
- C-1: Explanation of type of audit information
- C-3(k): Include if ESCO is to provide financing option
- Use of Appendix F and Proposal Requirements #8: These forms are related to submission of Political Contribution Disclosure forms. Only PSCL agencies are required to use these forms as pursuant to Public School Fiscal Accountability Procedures (N.J.A.C. 6A23A-6.3). The forms and references to it should be removed for all LPCL users.

Under the ESIP DIY approach, there would be no conflict in a properly procured single organization conducting the audit, developing the ESP, then preparing plans and specifications. This does not apply when using the ESCO approach, where the auditor and ESCO must be independent.

Once construction plans and specifications are complete, the contracting unit would then conduct the bidding process as it would any public works construction project: manage the project as it sees fit (the firm that did the plans could also serve as construction manager), and then contract as necessary for commissioning and final third party verification. The two verification steps (the ESP and verifying implementation) must be performed by an organization independent of the ones preparing the ESP, overseeing construction and commissioning.

By following this process, the contracting unit can then apply to the Local Finance Board for the issuance of ESIP-based energy saving obligations or enter into appropriate lease financing.

The ESIP approach to energy improvement provides a range of options for contracting units to accrue energy savings while improving the environment, taking advantage of low-cost financing and state and federal incentives. DLGS and the BPU encourage comments and questions (through the ESIP web page) on this new opportunity so we can improve it as time goes on.

Approved: Thomas H. Neff, Director, Division of Local Government Services

Table of Web Links

Page	Shortcut text	Internet Address
1, 4	Local Finance Notice 2009-11	http://www.nj.gov/dca/lgs/lfns/09lfns/2009-11.doc
2	ESIP webpage	http://www.nj.gov/dca/lgs/lpcl/esip.htm
2	email comments	mailto:lpcl@dca.state.nj.us
2	to register (via email	mailto:lpcl@dca.state.nj.us
2	GovConnect Local Procurement	http://www.nj.gov/dca/surveys/ppsurvey.htm
3	State Comptroller requirements.	http://www.nj.gov/comptroller/compliance/index.html

New Jersey's Clean Energy PROGRAM
Your Power to Save
njcleanenergy.com

New Jersey SmartStart BUILDINGS

BPU

2012 PAY FOR PERFORMANCE PROGRAM
Existing Buildings Incentive Structure

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Minimum Performance Target: **15%**

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APPENDIX E

Photovoltaic Analysis

Magnolia BOE
Magnolia Public School

Cost of Electricity	$0.163	/kWh
Electricity Usage	558,600	kWh/yr
System Unit Cost	$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$320,000	**80.0**	**102,222**	**0**	**$16,662**	**0**	**$16,662**	**$0**	**$8,178**	**19.2**	**12.9**

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= $80 /1000kwh

Area Output*
2,639 m2
28,407 ft2

Perimeter Output*
463 m
1,520 ft

Available Roof Space for PV:
(Area Output - 10 ft x Perimeter) x 85%
11,222 ft2

Approximate System Size: Is the roof flat? (Yes/No) Yes

8 watt/ft2
89,776 DC watts
80 kW Enter into PV Watts

PV Watts Inputs***

Array Tilt Angle	20	Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)
Array Azimuth	180	Enter into PV Watts (default)
Zip Code	08049	Enter into PV Watts
DC/AC Derate Factor	0.83	Enter info PV Watts

PV Watts Output
102,222 annual kWh calculated in PV Watts program

% Offset Calc

Usage	558,600	(from utilities)
PV Generation	102,222	(generated using PV Watts)
% offset	18%	

* http://www.freemaptools.com/area-calculator.htm
** http://www.flettexchange.com
*** http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html

PVWatts * * * * *

AC Energy & Cost Savings

* * * * *

Cautions for Interpreting the Results

(Type comments here to appear on printout; maximum 1 row of 90 characters.)

Station Identification

Cell ID:	0267373
State:	New Jersey
Latitude:	39.8 ° N
Longitude:	74.8 ° W

PV System Specifications

DC Rating:	80.0 kW
DC to AC Derate Factor:	0.830
AC Rating:	66.4 kW
Array Type:	Fixed Tilt
Array Tilt:	20.0 °
Array Azimuth:	180.0 °

Energy Specifications

Cost of Electricity:	16.3 ¢/kWh

Results

Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	2.71	5606	913.78
2	3.50	6600	1075.80
3	4.81	9672	1576.54
4	5.27	10001	1630.16
5	5.81	11101	1809.46
6	6.13	10975	1788.92
7	5.76	10558	1720.95
8	5.63	10280	1675.64
9	5.03	9088	1481.34
10	4.04	7824	1275.31
11	2.90	5579	909.38
12	2.46	4939	805.06
Year	4.51	102222	16662.19

Output Hourly Performance Data

(Gridded data is monthly, hourly output not available.)

Output Results as Text

Saving Text from a Browser

Run PVWATTS v.2 for another location

Run PVWATTS v.1

RReDC home page (http://rredc.nrel.gov)

APPENDIX F

EPA Portfolio Manager

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Magnolia Public School

Building ID: 3400017
For 12-month Period Ending: October 31, 2012[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: January 04, 2013

Facility
Magnolia Public School
420 N. Warwick Road
Magnolia, NJ 08049

Facility Owner
Magnolia Public School
420 N. Warwick Road
Magnolia, NJ 08049

Primary Contact for this Facility
Ralph Johnson
420 N. Warwick Road
Magnolia, NJ 08049

Year Built: 1936
Gross Floor Area (ft²): 82,723

Energy Performance Rating[2] (1-100) 41

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	1,676,589
Natural Gas (kBtu)[4]	4,683,800
Total Energy (kBtu)	6,360,389

Energy Intensity[4]

Site (kBtu/ft²/yr)	77
Source (kBtu/ft²/yr)	127

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	487

Electric Distribution Utility
Public Service Electric & Gas Co

National Median Comparison

National Median Site EUI	71
National Median Source EUI	118
% Difference from National Median Source EUI	8%
Building Type	K-12 School

Stamp of Certifying Professional

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

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

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

Certifying Professional
Gary Edmerson
6 Campus Drive
Parsippany, NJ 07054

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Magnolia Public School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	420 N. Warwick Road, Magnolia, NJ 08049	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of a hospital, k-12 school, hotel and senior care facility) nor can they be submitted as representing only a portion of a building.		☐
Magnolia Public School (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	82,723 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	84	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	30 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	10(Optional)	Is this school in operation for at least 8 months of the year?		☐

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

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

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

Fuel Type: Electricity

Meter: Electricity Meter (kWh (thousand Watt-hours))
Space(s): Magnolia Public School
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
10/01/2012	10/31/2012	43,260.00
09/01/2012	09/30/2012	38,120.00
08/01/2012	08/31/2012	28,800.00
07/01/2012	07/31/2012	30,800.00
06/01/2012	06/30/2012	35,120.00
05/01/2012	05/31/2012	39,440.00
04/01/2012	04/30/2012	42,080.00
03/01/2012	03/31/2012	43,680.00
02/01/2012	02/29/2012	49,960.00
01/01/2012	01/31/2012	48,000.00
12/01/2011	12/31/2011	43,720.00
11/01/2011	11/30/2011	48,400.00
Electricity Meter Consumption (kWh (thousand Watt-hours))		**491,380.00**
Electricity Meter Consumption (kBtu (thousand Btu))		**1,676,588.56**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**1,676,588.56**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: Natural Gas Meter (therms)
Space(s): Magnolia Public School

Start Date	End Date	Energy Use (therms)
10/01/2012	10/31/2012	1,476.80
09/01/2012	09/30/2012	748.96
08/01/2012	08/31/2012	20.92
07/01/2012	07/31/2012	10.44
06/01/2012	06/30/2012	82.96
05/01/2012	05/31/2012	1,715.09
04/01/2012	04/30/2012	3,646.20
03/01/2012	03/31/2012	9,327.99
02/01/2012	02/29/2012	11,673.60
01/01/2012	01/31/2012	9,410.56

12/01/2011	12/31/2011	4,628.48
11/01/2011	11/30/2011	4,096.00
Natural Gas Meter Consumption (therms)		**46,838.00**
Natural Gas Meter Consumption (kBtu (thousand Btu))		**4,683,800.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**4,683,800.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Magnolia Public School
420 N. Warwick Road
Magnolia, NJ 08049

Facility Owner
Magnolia Public School
420 N. Warwick Road
Magnolia, NJ 08049

Primary Contact for this Facility
Ralph Johnson
420 N. Warwick Road
Magnolia, NJ 08049

General Information

Magnolia Public School	
Gross Floor Area Excluding Parking: (ft^2)	82,723
Year Built	1936
For 12-month Evaluation Period Ending Date:	October 31, 2012

Facility Space Use Summary

Magnolia Public School	
Space Type	K-12 School
Gross Floor Area (ft^2)	82,723
Open Weekends?	No
Number of PCs	84
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	30
Percent Heated	100
Months °	10
High School?	No
School District °	N/A

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 10/31/2012)	**Baseline** (Ending Date 09/30/2012)	**Rating of 75**	**Target**	**National Median**
Energy Performance Rating	41	38	75	N/A	50
Energy Intensity					
Site ($kBtu/ft^2$)	77	80	56	N/A	71
Source ($kBtu/ft^2$)	127	129	92	N/A	118
Energy Cost					
$/year	$ 123,150.99	$ 119,198.78	$ 89,244.03	N/A	$ 114,117.68
$/$ft^2$/year	$ 1.49	$ 1.44	$ 1.08	N/A	$ 1.38
Greenhouse Gas Emissions					
$MtCO_2e$/year	487	495	353	N/A	451
$kgCO_2e/ft^2$/year	6	6	4	N/A	6

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

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

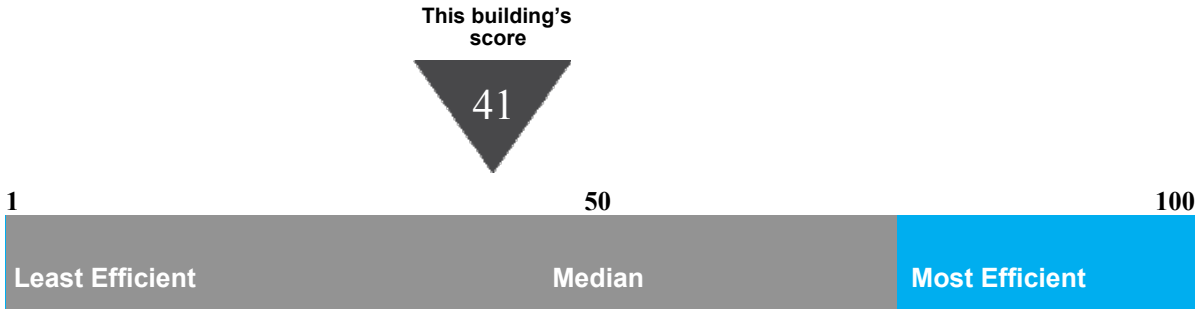
Statement of Energy Performance

2012

Magnolia Public School
420 N. Warwick Road
Magnolia, NJ 08049

Portfolio Manager Building ID: 3400017

The energy use of this building has been measured and compared to other similar buildings using the Environmental Protection Agency's (EPA's) Energy Performance Scale of 1–100, with 1 being the least energy efficient and 100 the most energy efficient. For more information, visit energystar.gov/benchmark.



This building uses 127 kBtu per square foot per year.*

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

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

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

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 01/04/2013