BETHLEHEM TOWNSHIP BOARD OF EDUCATION CONLEY ELEMENTARY SCHOOL ENERGY ASSESSMENT

FOR NEW JERSEY BOARD OF PUBLIC UTILITIES

NOVEMBER 2012

Prepared by:



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CHA PROJECT NO. 24735

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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 $\pm 20\%$, 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 Bethlehem Township School District. 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 |
|------------------------------------|--|----------------|----------------------|
| Thomas Conley Elementary School | 940 Iron Bridge Road Asbury, NJ 08802 | 59,584 | 1978 |

The Energy Conservation Measures (ECMs) and Operations and Maintenance Measures (OMMs) identified in this report are potential energy savings opportunities that, if implemented, will reduce the consumption of electricity, water, gas and/or fuel oil. These measures may qualify for incentive programs such as New Jersey SmartStart Buildings Program, Direct Install Program, Pay for Performance (P4P) or Energy Savings Improvement Plan (ESIP). A brief summary of the requirements of each program is provided in this report and more detailed information is available at the NJBPU website:

The potential annual energy savings and associated cost savings for each energy conservation measure (ECM) is shown in Table 1 below. Each measure's savings are dependent on implementing that measure alone. There are no interactive effects included in the calculations. The lighting ECM's are presented in three options. Only one option can be included. The potential incentive saving is calculated using the Smart Start program only. Additional incentives may be available for some ECM's and should be evaluated if the incentive is to implemented.

Table 1: Summary of Energy Conservation Measures

| | Summary of Energy Conservation Measures | | | | | | | | | | |
|-------|---|--------------------------|---------------------------------|--|---------------------------------|---------------------------------------|--------------------------------------|--|--|--|--|
| Energ | y Conservation Measure | Approx. Costs (\$) | Approx. Savings (\$/year) | Payback (Years) w/o Incentive | Potential Incentive (\$)* | Payback (Years) w/ Incentive | Recommended For Implementation | | | | |
| ECM-1 | Replace Door Seals & Sweeps | \$400 | \$900 | 0.4 | \$0 | 0.4 | х | | | | |
| ECM-2 | Replace Classroom Cabinet Heaters w/ Finned Radiation | \$19,000 | \$1,900 | 10.0 | \$0 | 10.0 | х | | | | |
| ECM-3 | Replace Motors with Premium Efficiency Motors | \$6,000 | \$700 | 8.6 | \$300 | 8.1 | Х | | | | |
| ECM-4 | Night-time Setback HVAC Equipment | \$1,000 | \$9,900 | 0.1 | \$0 | 0.1 | Х | | | | |
| ECM-5 | Install Fan & Dampers on Louvers | \$129,000 | \$1,100 | >20 | \$0 | >20 | Х | | | | |
| ECM-6 | Install DDC & BMS | \$307,000 | \$11,600 | 4.3 | \$0 | >20 | | | | | |
| ECM-7 | Lighting Replacements & Upgrades | \$140,000 | \$18,800 | 7.4 | \$5,300 | 7.2 | | | | | |
| ECM-8 | Lighting Controls | \$9,000 | \$7,100 | 1.3 | \$1,200 | 1.1 | | | | | |
| ECM-9 | Lighting Replacements & Lighting Controls | \$149,000 | \$23,700 | 6.3 | \$6,600 | 6.0 | Х | | | | |

The measures recommended by CHA above have a simple payback less than 15 years based on the requirement of the New Jersey Energy Savings Improvement Plan (ESIP), that all cumulative payback periods must be less than 15 years to be incentivized. If the recommended measures are implemented a total potential annual savings of \$38,200 may be realized with a payback period of 7.4 years.

2.0 INTRODUCTION AND BACKGROUND

The Thomas B. Conley Elementary School is a 59,584 square foot building consisting of one floor. The building was constructed in 1978 with an addition built in 2002. The original 1978 building includes fourteen classrooms, a resource room, library, large all-purpose room which is used as a cafeteria, kitchen, offices, toilet rooms, and a boiler room. The 2002 addition includes a gymnasium, eleven classrooms, offices, toilet rooms, storage, and a boiler room. The school hours of operation are from 6:00 AM – 11:00 PM Monday through Friday, with the school closed on Saturday and Sunday. The school has approximately 319 students and 45 faculty and staff members.

New Jersey's Clean Energy Program, funded by the New Jersey Board of Public Utilities, supports energy efficiency and sustainability for Municipal and Local Government Energy Audits. Through the support of a utility trust fund, New Jersey is able to assist state and local authorities in reducing energy consumption while increasing comfort.



Figure 1: Thomas Conley Elementary School

3.0 UTILITIES

Utilities include electricity and fuel oil. Electricity is supplied and delivered by Jersey Central Power & Light. Fuel oil is supplied and delivered by Allied Oil.

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

| | Electric | |
|---------------------|----------|------------|
| Annual Usage | 631,931 | kWh/yr |
| Annual Cost | 100,452 | \$ |
| Blended Rate | 0.159 | \$/kWh |
| Consumption Rate | 0.139 | \$/kWh |
| Demand Rate | 6.22 | \$/kW |
| Peak Demand | 202.90 | kW |
| Min. Demand | 149.80 | kW |
| Avg. Demand | 169.92 | kW |
| Fuel Oil | | |
| Annual Usage | 17,004 | gallons/yr |
| Annual Cost | 55,042 | \$ |
| Rate | 3.24 | \$/gallon |

Table 2: Actual Cost & Site Utility Usage

Electrical usage was generally higher in the summer months when air conditioning equipment was operational. Fuel oil consumption was higher 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. With the supply portion open to competition, customers can shop around for the best price on their energy supplies. Their 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 your 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) are energy savings improvements that require a financial investment. Each ECM has an associated simple payback period that is cost to implement the ECM divided by the energy savings (in dollars). Large capital intensive ECM's typically have longer payback periods. Operational and maintenance measures (OMM) are low or no cost operational opportunities, which can be implemented to have positive impacts on overall building operation, comfort levels, or energy usage.

4.1 Building Envelope

The original 1978 building structure consists of steel framing and concrete masonry units, with an exterior veneer of plaster on 2" styrofoam insulation. The interior finish is gypsum board and paint. The pitched roof is made from 24 gauge aluminized standing seam panels, and is framed with steel beams.

The 2002 addition consists of steel framing and concrete masonry units with a brick veneer. Two inches of cavity wall insulation is sandwiched between the masonry and the exterior brick. The interior consists of painted concrete masonry units. The roof of this addition is flat with a black rubber membrane roofing system that contains 3" insulation.

Windows and doors throughout the school building have been updated through the years. The majority of the windows are operable aluminum framed double glazing units. The doors seem to be in fair condition as examined during the site visit, but seals on many in the original 1978 building are unsatisfactory.

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

4.1.1 ECM-1 Replace Door Seals and Sweeps

The seals around exterior doors over time fail. This leads to unwanted infiltration of unconditioned outside air and exfiltration of conditioned air resulting in increased heating and cooling energy usage. This measure calls for the replacement of all exterior door seals.

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

| Budgetary Cost | Annual Ut | tility Saving | 8 | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|--|-----------|---------------|----------|-------|--------------------------|------------------|-------|-----------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 400 | 0 | 0 | 270 | 900 | 0 | 900 | 10.1 | 0 | 0.4 | 0.4 |
| Expected Life: <u>5</u> years Lifetime Savings: 0 kWh 1,350 | | | | | gallons | \$ | 4,500 | <u> </u> | | |

ECM-1 Door Seals and Sweeps

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

This measure is not recommended.

4.2 HVAC Systems

Thomas Conley Elementary school has two completely separate and independent HVAC systems: one for the original 1978 building, and one for the 2002 addition.

HVAC for the Original 1978 Building

The original 1978 building has two light oil (#2 oil) fired H.B. Smith cast iron sectional boilers with a capacity of 1,139,100 BTUH each. These boilers were built in 1978. Both boilers are operational during the heating season, and provide hot water that is used to heat the school. The hot water is circulated through the building by two 5.0 HP pumps, which operate on a lead-lag basis. The electric motors for these pumps operate at an efficiency of 83.1%. The classrooms in the 1978 building are heated by wall mounted cabinet heaters, which consist of a 3/8" O.D. hot water finned tube heating element coupled with a small blower fan. A typical classroom has four cabinet heaters piped in series along the length of the exterior wall under the windows and covered with equal length enclosures. Each cabinet heater delivers 3.4 MBH at 250 cfm airflow, drawing 60 watts at 120/1/60 current. It was noted during the site visit that some of the blower fans have become loud when operating and school personnel have disconnected them. This has resulted in reduced heating capacity in these classrooms. Outside ventilation air is provided by three centralized air handling systems that deliver conditioned air to the classrooms and cafeteria via a ducted distribution system located above the ceiling. Exhaust air is ducted back through the air handling system and its energy is transferred to the incoming air stream via a motorized energy wheel, before exiting the building. It was noted during the site visit that these air handling systems run 24 hours a day, 7 days a week, for the duration of the school year. Although these air handling systems use energy recovery wheels, their constant operation during unoccupied hours wastes electricity.

The original 1978 building has a high roof with two levels of pitch, the steepest at the top. All of the classrooms, offices, cafeteria etc. occupy only a first floor (the Boiler Rm is stepped down at a slightly lower elevation). The space directly above the ceiling is attic space. The bulk of the attic space, except for three mechanical rooms, is open. At each gable end of this building are 6 louvers—3 above, and 3 below. The three lower louvers, at either end of the building, are connected with ductwork and tie into the existing air handling systems, functioning as either outside air, exhaust air, or relief. The three upper louvers on either end of the building, however, are not ducted and are simply open to the outside. It was noted during the site visit that on windy days, the airflow through the attic was causing a pressure differential that would literally 'lift up' or 'push down' the drop ceiling above the classrooms and corridors. This results in an unnecessary drafty condition and causes excessive heat loss or heat gain from the building, depending upon the season.

Ceiling mounted fan coil units with hot water heating coils and direct expansion (DX) cooling coils provide heat and air conditioning to offices. These are connected via refrigeration lines to condensing units remotely located outside.

Entranceways and toilet rooms are heated with wall mounted hydronic cabinet heaters. Storage rooms are heated with small hydronic unit heaters or wall mounted cabinet heaters.

The majority of the original 1978 building is not air conditioned.

HVAC for the 2002 Addition

The Thomas Conley 2002 addition has an HVAC system completely independent from the original 1978 building. Two light oil (#2 oil) fired H.B. Smith cast iron sectional boilers series 28A-5, built in 2001, with a capacity of 1,014,000 BTUH each, provide hot water to heat this addition. The hot water is circulated around the building by two 7.5 HP pumps which operate on a lead-lag basis. The electric motors for these pumps operate at an efficiency of 85.5%. Seven of the thirteen classrooms are heated and cooled by vertical self-contained Airedale unit ventilators, model #SCX. These units are equipped with hot water heating coils and DX cooling coils and are installed in a manufacturer's enclosure tight to a large louver in the exterior wall. Outside air is drawn in through the louver, mixed with return air, and supplied out the top of the unit via ductwork installed above the ceiling, and delivered into the classroom through ceiling-mounted diffusers. Air returns to the unit through two ceiling mounted return grilles per classroom.

The remainder of the classrooms, corridors, music room, art room, offices, and Gymnasium, are served by seven rooftop units. These are all 2001 Carrier Weathermaster packaged units (all model #50HJ), with air filters and DX cooling coils, delivering conditioned air to and from the space via ducted distribution systems. Heat is supplied downstream of each unit via hot water duct coils. Outside ventilation air and relief for the space is provided at the unit.

Storage rooms are heated by hydronic unit heaters or finned tube radiation. Entranceways are heated by hydronic ceiling mounted or floor mounted cabinet heaters.

The majority of the 2002 addition is air conditioned.

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 Replace Classroom Cabinet Heaters with Finned Radiation

Classrooms in the original 1978 building are heated by wall-mounted Dunham-Bush cabinet heaters piped in series along the exterior wall. Both the cabinet heaters themselves and the piping that connects them are covered by a common enclosure. Each cabinet heater consists of 3/8" OD finned radiation coupled with small electric blower fans underneath. These cabinet heaters are original to the building and when operating properly deliver 3.4 MBH of heat in 250 cfm of air, drawing 60 watts of power at 120v/1/60. In many cases the blower fans are malfunctioning or have become noisy and school personnel have disconnected them. Replacement parts have become difficult or impossible to find, since this model is no longer manufactured.

An investigation of the original HVAC drawings indicates that typical HWS&R piping serving these cabinet heaters are 1-1/4" OD drops inside the walls at the classroom corners, with control valves that tie in with the classroom thermostat. It is proposed that new finned tube radiation (out-fitted with a control valve) be installed as replacement of the existing cabinet heaters and connect to the existing 1-1/4" HWS&R piping drops. New finned tube radiation could be sized to provide the exact heating requirement of each classroom and could do so without noise and without using electricity. This measure could be implemented with minimal impact on the existing hot water piping system, since finned tube elements typically have diameters larger than the existing 3/8" piping, no additional dynamic head would be added to the hot water pumps, and system re-balancing could easily be achieved.

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

| - | | | | | | | | | | | |
|-------------------------------|-----------|--------------|----------|-------|--------------------------|------------------|-----|-----------|---------------------|------------------|--|
| Budgetary Cost | Annual Ut | ility Saving | 3 | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with | |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) | |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years | |
| 19,000 | 11,800 | 0 | 0 | 1,900 | 0 | 1,900 | 1.5 | 0 | 10 | 10 | |
| Expected Life: Lifetime | 25 | years | | | | | | | | | |

ECM-2 Replace Classroom Cabinet Heaters with Finned Radiation

Savings: 295,000 kWh 0 gallons \$47,500 * Incentive shown is per the New Jersey Direct Install Program. See section 5.0 for other incentive opportunities

This measure is recommended.

OMM-1 HVAC Unit Maintenance

Regular maintenance of HVAC units is necessary not only because it saves energy by keeping them operating at optimal efficiency, but also insures that the equipment does not fail. Some areas that reduce efficiency are: dirty condenser/evaporator coils, dirty filters and fan blades, air leaks and dirty heat transfer surfaces. Implementing a routine maintenance strategy will allow for better indoor air quality, increased efficiency and improved equipment life.

4.2.2 ECM-3 Replace Motors with Premium Efficiency Motors

In the 1978 boiler room the two heating hot water primary circulating pump motors are 5 HP with efficiencies of approximately 83.1%. In the boiler room of the 2002 addition the two heating hot water primary circulating pump motors are 7.5 HP with efficiencies of approximately 85.5%. Replacing these four motors with premium efficiency motors which have rated efficiency of 95% will reduce demand and save electrical energy. This measure is recommended on an as needed basis such that as motors fail they should be replaced with premium efficiency motors.

| Budgetary Cost | Annual L | Jtility Savin | gs | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------------------|--------------|---------------|-------------|-------------|--------------------------|------------------|----------|---------------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 6,000 | 3,800 | 0 | 0 | 700 | 0 | 700 | 0.7 | 300 | 8.6 | 8.1 |
| Expected Life: Lifetime | 15 | years | | | | | | | | |
| Savings: | 57,000 | kWh | 0 | | gallons | \$10,500 | | | | |
| * Incentive sho | own is per t | he New Je | rsey Direct | Install Pro | ogram. See sect | ion 5.0 for o | ther inc | entive opport | unities | |

ECM-3 Replace Motors with Premium Efficiency Motors

This measure is recommended.

4.2.3 ECM-4 Night-time Setback for Air Handling Units

During the site visit, it was noted that the three main air handling units, located in the upper mechanical rooms of the original 1978 building operate 24 hours a day 7 days a week throughout the school year. These existing air handling units are primarily tasked with providing ventilation throughout the building. Existing classroom / entranceway cabinet heaters and small HVAC units have the responsibility of providing heat for the facility. During night-time hours and during unoccupied weekends there are no occupants in the building, and ventilation air is not required. Operating the air handling units during unoccupied hours is 1) not required for ventilation reasons, 2) not required in order to maintain building temperature, and 3) wasteful of energy.

The existing Barber Coleman controls system in the original 1978 building could be reconfigured to incorporate night-time setback.

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

| Budgetary Cost | Annual Ut | ility Savings | 3 | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|---|-------------------------------|----------------------------|-------------|-------|--------------------------|------------------|-----|-----------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gal | \$ | \$ | \$ | | \$ | Years | Years |
| 1,000 | 62,000 | 0 | 0 | 9,900 | 0 | 9,900 | 147 | 0 | 0.1 | 0.1 |
| Expected Life: Lifetime Savings: * There is no ir | 15 930,000 ncentive for | years kWh this measu | C re. |) | gallons | \$148,50 | 0 | | | |

ECM-4 Night-time Setback for Air Handling Units

This measure is recommended.

4.2.4 ECM-5 Install Fan & Motorized Dampers at Attic Louvers

The original 1978 building has six louvers on the gable ends of the building. The three upper louvers on either end of the building are not ducted into the air handling system, and are open to the outside. Due to this condition the attic space has outside air blowing into and through it. At best the interior of the attic space is only a few degrees above the ambient outdoor temperature during the winter. Furthermore it was noted during the site visit that on windy days, the airflow through the attic causes a pressure differential that literally 'lifts up' or 'pushes down' the drop ceiling above the classrooms and corridors. This results in unnecessary air infiltration and causes an additional heating load on the building.

This ECM proposes that the upper three louvers on either end of the building be outfitted with dampers and actuators, one for each upper louver, for a total of six. These actuators can be controlled via the existing Barber Coleman controls system to open or close at the owner's discretion. The installation of these dampers will diminish the excessive flow of outdoor air throughout the attic space during the colder months. It is also proposed that the west end upper center louver be outfitted with a sidewall propeller exhaust fan in addition to the motorized damper. This will aid in exhausting some of the heat that accumulates in the attic on hot days.

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

| Budgetary Cost | Annual Ut | tility Savings | 8 | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------------------|--------------|----------------|-------------|-------|--------------------------|------------------|-----|-----------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gal | \$ | \$ | \$ | | \$ | Years | Years |
| 129,000 | 0 | 0 | 300 | 1,100 | 0 | 1,100 | 0.6 | 0 | >20 | >20 |
| Expected Life: Lifetime | 15 | years | | | | | | | | |
| Savings: | 0 | kWh | 4,5 | 00 | gallons | \$16,500 | | | | |
| * There is no ir | ncentive for | this measu | re. | | | | | | | |

ECM-5 Install Fan & Motorized Dampers at Attic Louvers

This measure is recommended.

4.3 Control Systems

The Thomas Conley Elementary school has two separate control systems: a Barber Coleman system that serves the original 1978 building, and a direct digital control (DDC) system that serves the 2002 addition. Typical set points for the original 1978 building range between 70 and 72 degrees Fahrenheit. There is no unoccupied set point and the school is heated continuously to 70-72°F during the heating season between November and April. The majority of the 1978 building is not cooled.

The 2002 addition has a DDC system that controls and monitors the HVAC equipment. Typical occupied set points for the 2002 addition range between 70 and 72 degrees Fahrenheit during the heating season; and approximately 75 degrees during the cooling season. Unoccupied set points are approximately 60 degrees for heating, and 85 degrees for cooling. The majority of the 2002 addition is cooled.

The following ECMs identified are improvements to the HVAC control system for the original 1978 building:

4.3.1 ECM-6 Install Direct Digital Controls and Building Management System

Pneumatic control systems use compressed air as a medium to control HVAC equipment. This is accomplished by bleeding or draining the compressed air in the air lines going to the control devices such as sensors or thermostats to maintain a set line pressure. This in turn provides feedback in the loop to close or open dampers and actuators to meet the control set point. In addition to the age and inadequacies of the system, compressed air is an inefficient and expensive means of controlling a building's HVAC system.

New direct digital control (DDC) systems use electrical signals to manage HVAC equipment. In combination with a building management system (BMS) which allows for trending, scheduling and remote control, the DDC and BMS system will save fuel oil and electrical energy. The new system will be able to set a schedule for occupied and unoccupied set-points as well as shutdown/startup of HVAC equipment. It will also eliminate the compressed air system including the air compressor and compressed air dryer.

Savings are seen from temperature scheduling for occupied and unoccupied hours and from the elimination of the air compressor.

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

| Budgetary Cost | Annual L | Jtility Savin | gs | | Estimated Maintenanc e | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------------------|----------|---------------|----------|--------|------------------------------|------------------|-------|-----------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 307,000 | 1,900 | 4 | 3,400 | 11,600 | 0 | 11,600 | (0.4) | 0 | >20 | >20 |
| Expected Life: Lifetime | 16 | years | | | | | | | | |
| Savings: | 30,400 | kWh | 54,4 | 400 | gallons | \$185,6 | 600 | | | |

ECM-6 Install Direct Digital Controls & Building Management System

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

This measure is not recommended.

4.4 Domestic Hot Water System

The 1978 original building has one Bock water heater and one A.O. Smith storage tank. The Bock water heater (model # 361E ASME) is an oil fired unit with a recovery rate of 442 GPH at a 90°F temperature rise, and can store 113 gallons of water. The A.O. Smith DHW storage tank (model #T50 OA) has a capacity of 500 gallons. The domestic hot water tanks serve the kitchen, toilet rooms and sinks located throughout the building.

The 2002 addition has one electric 2001 A.O. Smith water heater (Cat. # DSE 80) with two 90 kw elements. This water heater can store 80 gallons of water and has a total heating capacity of 180 kW. This unit serves the kitchen, toilet rooms and sinks located throughout the 2002 addition.

4.5 Lighting/Electrical Systems

The majority of the lighting in the original 1978 building is T-12 fluorescent tube fixtures with magnetic ballasts and incandescent lamps. The multipurpose room is illuminated with T8 fluorescent high bay fixtures. The 2002 addition has a mixture of mostly T8 fluorescent fixtures with electronic ballasts and a few T-12 fluorescent fixtures with magnetic ballasts. The building exterior utilizes approximately (44) 150W metal halide lamps, (16) par38 120W spotlights, and (6) 75W incandescents. A comprehensive lighting survey can be found in Appendix B.

The following ECMs identified are improvements to Thomas Conley's Elementary School's lighting and electrical system:

4.5.1 ECM-7 Lighting Replacement / Upgrades

The original 1978 building mostly utilizes T-12 fluorescent fixtures. Compared to T-8 fixtures, these bulbs consume more energy and are less efficient. The ballasts are magnetic as well. Each switch and circuit was identified, and the number of fixtures, locations, and existing wattage established (Appendix B). There is an opportunity to reduce consumption by upgrading the lighting fixtures to a super T-8 fixture and all incandescent fixtures to compact fluorescent lamps. To upgrade the T12 fixtures to super T8's, the fixtures need to be re-lamped and re-ballasted and incandescent replacement only involves changing the bulbs to compact fluorescent bulbs.

The 2002 addition mostly utilizes T-8 fluorescent fixtures. The gymnasium however has approximately 40 high bay metal halide fixtures. It is proposed that these be replaced with lower wattage high bay LED fixtures which have higher efficiency and longer lifespan.

The exterior lighting is proposed to be changed from metal halide and incandescent to LED light fixtures which have a longer life and consume much less energy. The exterior lighting would require a full fixture replacement to change to LED fixtures.

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 59,976 kWh with an electrical demand reduction of about 26 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.

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

| | | - | | | | | | | | |
|-------------------------------|---------------|-----------|-------------|--------|------------------------------|------------------|-----|-----------|---------------------|------------------|
| Budgetary Cost | Annual Utilit | y Savings | | | Estimated Maintenanc e | Total Savings | ROI | Incentive | Payback (without | Payback (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gal | \$ | \$ | \$ | | \$ | Years | Years |
| 140,000 | 100,700 | 26 | 0 | 18,800 | 0 | 18,800 | 0.8 | 17,900 | 7.4 | 6.5 |
| Expected Life: Lifetime | 15 | years | | | | | | | | |
| Savings: | 1,510,500 | kWh | | 0 | gallons | \$282,00 | 0 | | | |

ECM-7 Lighting Replacement

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

This measure is not recommended in lieu of ECM-9.

4.5.2 ECM-8 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 39,749 kWh.

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

| Budgetary Cost | Annual Ut | ility Saving | S | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------|-----------|--------------|----------|-------|--------------------------|------------------|------|-----------|---------------------|------------------|
| | Electric | Electric | Fuel oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 9,000 | 44,900 | 0 | 0 | 7,100 | 0 | 7,100 | 11.3 | 1,400 | 1.3 | 1.1 |

ECM-8 Install Lighting Controls (Occupancy Sensors)

Expected

Life: 15 years Lifetime

Savings:

673,500 kWh gallons \$106,500 0 * Incentive shown is per the New Jersey Direct Install Program. See section 5.0 for other incentive opportunities

This measure is not recommended in lieu of ECM-9.

4.5.3 ECM-9 Lighting Replacements with Controls (Occupancy Sensors)

This measure is a combination of ECM 4 and ECM 5; recommending to 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 70,316 kWh with a demand reduction of 21 kW at a total of \$15,794.

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

| | Lighting | Jinepiac | | | upancy ben | 3013 | | | | |
|-------------------|------------------------|----------|----------|--------|--------------------------|------------------|-----|-----------|---------------------|------------------|
| Budgetary Cost | Annual Utility Savings | | | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 149,000 | 131,300 | 26 | 0 | 23,700 | 0 | 23,700 | 1.1 | 19,300 | 6.3 | 5.5 |
| Expected | | | | | | | | | | |

| LOW-3 LIGHTING REPLACEMENT WITH OCCUPATION DEHISORS |
|---|
|---|

Life:

Lifetime

Savings: 1,969,500 kWh 0 gallons \$355,500

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

This measure is recommended.

15

years

4.6 Plumbing Systems

The original 1978 building has older 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 (14) water closets with an average water use of 5.5 gpf, (10) urinals with an average of 3 gpf and (24) faucets with a flow of 3 gpm. Per the number of occupants, it was estimated that each water closet and faucet is utilized approximately 4 times per day.

In the 2002 addition the general restrooms viewed during the site visit contained water closets which use 1.6 gpf, and urinals which use 1.0 gpf. Faucets generally have aerators, but are not specifically designated to be low flow. Plumbing fixtures in this addition meet current water efficiency standards.

4.7 Kitchen Equipment

Cooking equipment for the kitchen within the school is all fueled by electricity. This includes the steam table, stove, oven, dishwasher, and dishwasher booster heater.

5.0 PROJECT INCENTIVES

5.1 Incentives Overview

5.1.1 New Jersey Pay For Performance Program

The school 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.

<u>Electric</u>

- 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

<u>Gas</u>

- 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.

<u>Electric</u>

- 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

<u>Gas</u>

- 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

The table below shows potential incentives available for the Thomas B. Conley Elementary School through Pay for Performance program:

| | Incer | Incentives \$ | | | |
|----------------------|----------|---------------|----------|--|--|
| | Elec | Therms | Total | | |
| Incentive #1 | \$0 | \$0 | \$5,958 | | |
| Incentive #2 | \$23,186 | \$0 | \$23,186 | | |
| Incentive #3 | \$23,186 | \$23,186 \$0 | | | |
| Total All Incentives | \$46,371 | \$46,371 \$0 | | | |

All ECM's that yield electrical savings were included in the incentive calculations for the P4P program. Oil savings ECM's cannot be included. The total annual savings exceeds the minimum program requirement of 15% annually. Refer to appendix D for detailed calculations.

5.1.2 New Jersey Smart Start Program

For this report, some energy conservation measures are applicable to the 2012 Smart Start Incentive Program and associated savings are included. This program provides incentives for pre-approved mechanical and electrical equipment replacements and preapproved custom measures. The program includes a wide variety of incentives ranging from chillers and boilers, variable frequency drives, unitary HVAC equipment and lighting retrofits. Each incentive must be applied for and approved by the NJBPU (or corresponding utility program) prior to the installation of the equipment. Incentive payments are made to the owner after the equipment is fully installed and paid for.

5.1.3 Direct Install Program

The Direct Install Program targets small and medium sized facilities where the peak electrical demand does not exceed 150 kW 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 significantly reduce the implementation cost of energy conservation projects.

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 a Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website at New Jersey BPU – Bethlehem Township School District- Energy Audit 17

http://www.njcleanenergy.com. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document.

Due to the demand exceeding the 150 kW threshold, this building is not eligible for Direct Install incentives.

5.1.4 Energy Savings Improvement Plans (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 (see Appendix E). 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.

6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

6.1 Solar

6.1.1 Photovoltaic Rooftop Solar Power Generation

The school 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 a 90 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 \$95/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 \$487/ SREC per year and this number was utilized in the cash flow for this report.

The existing load justifies the use of 90 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 a 90 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:

| Budgetary Cost | Annual Utility Savings Electricity Fuel Oil Total kW kWh Gallons \$ | | Total Savings | New Jersey Renewable Energy Incentive* | New Jersey Renewable SREC** | Payback (without incentive) | Payback (with incentives) | | |
|-------------------|---|---------|------------------|--|--------------------------------------|-----------------------------------|---------------------------------|-------|-------|
| | | | Fuel Oil | Total | | | | | |
| \$ | | | Gallons | \$ | \$ | \$ | \$ | Years | Years |
| 360,000 | 90 | 115,188 | 0 | 18,310 | 18,310 | 0 | 7,487 | 19.7 | 14.0 |

Photovoltaic (PV) Rooftop Solar Power Generation - 90 kW System

** Estimated Solar Renewable Energy Certificate Program (SREC) at \$77/1000 kWh

This measure is not recommended.

6.1.2 Geothermal Heat Pump System

Geothermal Heat pump systems use the relatively constant ground temperature to transfer heat from and to the building. In the winter months (heating mode) heat is absorbed from the ground and transferred to the building. In the summer months (cooling mode), heat is extracted from the building and transferred to the earth. There are several configuration of a Geothermal Systems, the most common is the closed-loop deep well system. This system involves boring multiple deep (400 feet plus) and installing closed loop piping inside each bore. The heat transfer fluid (typically food grade anti-freeze) is pumped from the bore fields into the building. Within the building individual heat pump units extract or reject compressor heat to the loop piping. Room air is heated or cooled by the refrigeration compressor. Another lees common variation of the geothermal system uses an open loop distribution system. This type of system circulates pond, river or ground spring water through a heat exchanger located within the building to similar room mounted heat pump units.

This system is popular for new construction as it is first cost intensive and can be more easily absorbed within the construction budget .It does not lend itself well to retrofits as it requires bore field drilling, underground piping , dedicated pumps individual heat pump units and specifically sized indoor and outdoor piping. Installation of this system within an existing building would require extensive exterior excavation and interior ceiling work. A large amount of available property is required for the bore field. A geothermal system requires year round operation (heating and cooling) to balance the heat transfer from/ to the ground.

Based on the high first cost and predominantly non-summer month usage, the payback period for implementing a geothermal heat pump system would exceed the equipment life and therefore this is not recommended.

| Budgetary Cost | Annual Util | ity Savings | | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------|-------------|-------------|-------------|--------|--------------------------|------------------|------|-----------|---------------------|------------------|
| 0000 | | | | | maintenance | Caringo | | * | (| (|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gal | \$ | \$ | \$ | | \$ | Years | Years |
| 1,200,000 | -277,000 | 0 | 17,000 | 11,000 | 0 | 11,000 | -6.8 | 83,250 | >20 | >20 |

Geothermal Heat Pump System

Expected Life: 25 years Lifetime
 Savings:
 -6,925,000
 kWh
 425,000
 gallons
 \$275,000

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

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/ft²/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/ft²/yr | Source EUI Btu/ft ² /yr | Energy Star Rating (1-100) |
|------------------------------------|----------------------|------------------------------------|-------------------------------|
| Thomas Conley Elementary School | 64 | 137 | 32 |

The Thomas Conley Elementary School has an above average EUI and a below average Energy Star rating (50% is the medium). This is most likely due to the poor building envelope and relatively high electrical usage. By implementing the measures discussed in this report, it is expected that the EUI can be reduced and the score increase.

The Portfolio Manager account can be accessed by entering the username and password shown below at the login screen of the Portfolio Manager website (<u>https://www.energystar.gov/istar/pmpam/</u>). The account has been shared with the NYSERDABENCHMARKING master account.

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

The user name and password for the building's EPA Portfolio Manager Account has been provided by CHA.

8.0 CONCLUSIONS & RECOMMENDATIONS

The energy audit conducted by CHA at the Thomas Conley Elementary School identified potential annual savings of \$38,200 may be realized for the recommended ECMs, with a summary of the costs, savings, and paybacks as follows:

ECM-1 Door Seals and Sweeps

| Budgetary | Annual Ut | ility Savings | 3 | | Estimated | Total | | | Payback | Payback |
|-----------|-----------|---------------|----------|-------|-------------|---------|------|----------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 400 | 0 | 0 | 270 | 900 | 0 | 900 | 10.1 | 0 | 0.4 | 0.4 |

| ECM-2 | Replace Classroom Cabinet Heaters with Finned Radiation |
|-------|---|
| | |

| Budgetary Cost | Annual Ut | Annual Utility Savings | | | | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------|-----------|------------------------|----------|-------|---------|------------------|-----|-----------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 19,000 | 11,800 | 0 | 0 | 1,900 | 0 | 1,900 | 1.5 | 0 | 10 | 10 |

ECM-3 Replace Motors with Premium Efficiency Motors

| Budgetary Cost | Annual L | Itility Savin | gs | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------|----------|---------------|----------|-------|--------------------------|------------------|-----|-----------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 6,000 | 3,800 | 0 | 0 | 700 | 0 | 700 | 0.7 | 300 | 8.6 | 8.1 |

| ECM-4 | Night-time Setback for | r Air | Handling | Units |
|-------|--------------------------|-------|----------|--------|
| | Thight third botbable is | | nananng | 011110 |

| Budgetary | Annual Ut | ility Saving | 6 | | Estimated | Total | | Incentive | Payback | Payback |
|-----------|-----------|--------------|-------------|-------|-------------|---------|-----|-----------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gal | \$ | \$ | \$ | | \$ | Years | Years |
| 1,000 | 62,000 | 0 | 0 | 9,900 | 0 | 9,900 | 147 | 0 | 0.1 | 0.1 |

| Budgetary Cost | Annual Ut | ility Savings | 6 | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------|-----------|---------------|-------------|-------|--------------------------|------------------|-----|-----------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gal | \$ | \$ | \$ | | \$ | Years | Years |
| 10,000 | 0 | 0 | 300 | 1,100 | 0 | 1,100 | 0.6 | 0 | 9.1 | 9.1 |

ECM-5 Install Fan & Motorized Dampers at Attic Louvers

ECM-9 Lighting Replacement with Occupancy Sensors

| Budgetary Cost | Annual Ut | ility Saving | S | | Estimated Maintenance | Total Savings | ROI | Incentive | Payback (without | Payback (with |
|-------------------|-----------|--------------|----------|--------|--------------------------|------------------|-----|-----------|---------------------|------------------|
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 149,000 | 131,300 | 26 | 0 | 23,700 | 0 | 23,700 | 1.1 | 19,300 | 6.3 | 5.5 |

APPENDIX A

Utility Usage Analysis and Alternate Supplier List

Thomas Conley Elementary School 940 Iron Bridge Road, Asbury, NJ 08802

Utility Bills: Account Numbers

| Account Number | School Building Elementary School | Location 940 Iron Bridge Road, Asbury, NJ 08802 | <u>Type</u> <u>Notes</u> Fuel Oil |
|---------------------------------|--------------------------------------|--|--------------------------------------|
| Ove | rall Utility Usage S | ummary | |
| | Electric | Fuel Oil | |
| Utility Costs* | \$ 100,452 | \$ 55,042 | |
| Utility Usage (kWh, Therm, Gal) | 631,931 | 17,004 | |
| \$ Cost/Unit (kWh, Therm, Gal) | 0.159 | 3.237 | |
| Electric Demand (kW) | 203 | | Total |
| Equivalent Site Usage (kBtu) | 2,156,781 | 1,700,380 | 3,857,161 |
| Equivalent Source Usage (kBtu) | 7,203,647 | 1,780,298 | 8,983,945 |



Thomas Conley Elementary School 940 Iron Bridge Road, Asbury, NJ 08802

Electric ServiceDelivery -JCPL ElectricSupplier -JCPL Electric

For Service at:Thomas Conley Elementary SchoolAccount No.:10 00 05 0978 01Meter No.:G21354793

| | | | | Charges | | | | Unit | Costs | | |
|-------------------|-------------|--------|--------------|-------------|-------------|-------|----------|------|---------|------|------|
| | Consumption | Demand | Total | Delivery | Supply | Blend | ded Rate | Cons | umption | De | mand |
| Month | (kWh) | (kW) | (\$) | (\$) | (\$) | (\$/ | /kWh) | (\$/ | ′kWh) | (\$/ | /kW) |
| July-11 | 44,160 | 149.80 | \$6,917.37 | \$1,383.41 | \$5,533.96 | \$ | 0.157 | \$ | 0.135 | \$ | 6.48 |
| August-11 | 53,760 | 167.40 | \$8,319.43 | \$1,582.98 | \$6,736.45 | \$ | 0.155 | \$ | 0.134 | \$ | 6.53 |
| September-11 | 56,640 | 202.90 | \$9,158.66 | \$1,852.57 | \$7,306.09 | \$ | 0.162 | \$ | 0.138 | \$ | 6.60 |
| October-11 | 45,440 | 190.10 | \$7,434.69 | \$1,584.13 | \$5,850.56 | \$ | 0.164 | \$ | 0.138 | \$ | 6.13 |
| November-11 | 58,240 | 186.20 | \$9,388.14 | \$1,723.52 | \$7,664.62 | \$ | 0.161 | \$ | 0.142 | \$ | 6.12 |
| December-11 | 58,240 | 163.50 | \$8,067.31 | \$1,512.62 | \$6,554.69 | \$ | 0.139 | \$ | 0.121 | \$ | 6.07 |
| January-12 | 52,842 | 174.40 | \$8,268.79 | \$1,567.56 | \$6,701.23 | \$ | 0.156 | \$ | 0.136 | \$ | 6.10 |
| February-12 | 66,452 | 172.00 | \$10,071.84 | \$1,624.74 | \$8,447.10 | \$ | 0.152 | \$ | 0.136 | \$ | 6.09 |
| March-12 | 49,280 | 169.60 | \$9,495.38 | \$2,091.07 | \$7,404.31 | \$ | 0.193 | \$ | 0.172 | \$ | 6.09 |
| April-12 | 51,593 | 160.30 | \$8,918.91 | \$2,557.40 | \$6,361.51 | \$ | 0.173 | \$ | 0.154 | \$ | 6.07 |
| May-12 | 47,835 | 151.40 | \$7,241.51 | \$1,342.93 | \$5,898.58 | \$ | 0.151 | \$ | 0.132 | \$ | 6.04 |
| June-12 | 47,449 | 151.40 | \$7,170.46 | \$1,326.30 | \$5,844.16 | \$ | 0.151 | \$ | 0.131 | \$ | 6.23 |
| Total (12-months) | 631,931 | 202.90 | \$100,452.49 | \$20,149.23 | \$80,303.26 | \$ | 0.159 | \$ | 0.139 | \$ | 6.22 |



Electric Usage - Thomas Conley Elementary School

Thomas Conley Elementary School 940 Iron Bridge Road, Asbury, NJ 08802

Fuel Oil Service

| Delivery - | Allied Oil |
|------------|------------|
| Supplier - | Allied Oil |

For Service at:Thomas Conley Elementary SchoolAccount No.:433247Meter No.:

| Month | Total (\$) | De | elivery (\$) | Sı | upply (\$) | Total Gallons | \$/Gal |
|-------------------|--------------|----|--------------|----|------------|---------------|------------|
| Nov-11 | \$ 9,465 | \$ | - | \$ | - | 3005 | \$ 3.15 |
| Jan-12 | \$ 15,482 | \$ | - | \$ | - | 4983 | \$ 3.11 |
| Feb-12 | \$ 12,993 | \$ | - | \$ | - | 4004 | \$ 3.24 |
| Apr-12 | \$ 17,103 | \$ | - | \$ | - | 5012 | \$ 3.41 |
| Total (12-months) | \$ 55,042 | \$ | - | \$ | - | 17,004 | \$ 3.24 |

Supplier Charges: Electricity

| | | (| Current Supplier) | (/ | Alternative Supplier) | |
|--------------|-------------|-----|-------------------|----|-----------------------|-----------------|
| | Consumption | Sou | th Jersey Energy | | PSE&G | Difference |
| Month | (kWh) | | (\$) | | (\$) | (\$) |
| January-11 | 76,800 | \$ | 8,131.85 | \$ | 8,718.68 | \$ 586.83 |
| February-11 | 79,500 | \$ | 8,417.46 | \$ | 9,595.59 | \$ 1,178.13 |
| March-11 | 74,100 | \$ | 7,845.71 | \$ | 9,185.98 | \$ 1,340.27 |
| April-11 | 66,300 | \$ | 7,019.84 | \$ | 8,023.02 | \$ 1,003.18 |
| May-11 | 66,900 | \$ | 6,257.16 | \$ | 7,997.13 | \$ 1,739.97 |
| June-11 | 73,800 | \$ | 6,902.51 | \$ | 8,897.56 | \$ 1,995.05 |
| July-11 | 58,800 | | n/a | | n/a | n/a |
| August-11 | 45,000 | \$ | 4,208.85 | \$ | 6,554.16 | \$ 2,345.31 |
| September-11 | 61,200 | \$ | 5,724.04 | \$ | 7,999.16 | \$ 2,275.12 |
| October-11 | 59,400 | \$ | 5,555.68 | \$ | 7,227.43 | \$ 1,671.75 |
| November-11 | 68,400 | \$ | 6,397.45 | \$ | 7,783.03 | \$ 1,385.58 |
| December-11 | 83,400 | \$ | 7,800.40 | \$ | 8,940.12 | \$ 1,139.72 |
| January-12 | 79,800 | \$ | 7,463.69 | \$ | 9,081.93 | \$ 1,618.24 |
| February-12 | 81,600 | \$ | 7,871.95 | \$ | 9,558.32 | \$ 1,686.37 |
| March-12 | 77,400 | \$ | 7,466.78 | \$ | 8,800.64 | \$ 1,333.86 |
| April-12 | 68,100 | \$ | 6,569.61 | \$ | 7,977.49 | \$ 1,407.88 |
| Total (All) | | \$ | 103,632.98 | \$ | 126,340.24 | \$ 22,707.26 |

JCP&L SERVICE TERRITORY Last Updated: 10/24/12

*<u>CUSTOMER CLASS</u> - R – RESIDENTIAL C – COMMERCIAL I –INDUSTRIAL

| Supplier | Telephone & Web Site | *Customer Class |
|--|--|--------------------|
| AEP Energy, Inc. | (866) 258-3782 | С/І |
| Mount Laurel, NJ 08054 | www.aepenergy.com | ACTIVE |
| Alpha Gas and Electric, LLC 641 5 th Street | (855) 553-6374 | R/C |
| Lakewood, NJ 08701 | www.alphagasandelectric.com | ACTIVE |
| Ambit Northeast, LLC | (877) 30-AMBIT | R/C |
| Suite 300 Princeton, NJ 08540 | (877) 302-6248 www.ambitenergy.com | ACTIVE |
| AP Gas & Electric, LLC | (855) 544-4895 | R/C/I |
| 10 North Park Place, Suite 420 Morristown, NJ 07960 | www.apge.com | ACTIVE |
| Astral Energy LLC | (201) 384-5552 | R/C/I |
| 16 Tyson Place Bergenfield, NJ 07621 | www.astralenergyllc.com | ACTIVE |
| BBPC, LLC d/b/a Great | (888) 651-4121 | C/I |
| Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540 | www.greateasternenergy.com | ACTIVE |
| Champion Energy Services, | (877) 653-5090 | R/C/I |
| LLC 72 Avenue L Newark, NJ 07105 | www.championenergyservices.com | ACTIVE |
| Choice Energy, LLC | 888-565-4490 | R/C |
| Freehold, NJ 07728 | www.4choiceenergy.com | ACTIVE |
| Clearview Electric, Inc. | (888) CLR-VIEW | R/C/I |
| Woodbury, NJ 08096 | (800) /46-4/02 <u>www.clearviewenergy.com</u> | ACTIVE |
| Commerce Energy, Inc. | 1-866-587-8674 | R |
| 7 Cedar Terrace Ramsey, NJ 07446 | www.commerceenergy.com | ACTIVE |

| ConEdison Solutions | (888) 665-0955 | C/I |
|---|--|--|
| Cherry Tree Corporate Center | | |
| 535 State Highway | 1.1.2 | |
| Suite 180 Charry Hill NL 08002 | www.conedsolutions.com | ACTIVE |
| Cherry Hill, NJ 08002 | | |
| Constellation NewEnergy, Inc. | (800) 237-7093 | R/C/I |
| Ramsey NI 07446 | www.constellation.com | ACTIVE |
| Kullisey, 13 07 10 | | ACTIVE |
| Constellation Energy | (877) 997-9995 | R |
| 900A Lake Street, Suite 2 | | |
| Ramsey, NJ 07446 | www.constellation.com | ACTIVE |
| | | |
| Direct Energy Business, LLC | (888) 925-9115 | C/I |
| 120 Wood Avenue | | |
| Suite 611 | | |
| Iselin, NJ 08830 | www.directenergybusiness.com | ACTIVE |
| Direct Energy Services, LLC | (866) 547-2722 | C/I |
| 120 Wood Avenue | | |
| Suite 611 | | |
| Iselin, NJ 08830 | www.directenergy.com | ACTIVE |
| Discount Energy Group, LLC | (800) 282-3331 | R/C |
| 21500ano 211018, 010ap, 220 | | 10.0 |
| 811 Church Road, Suite 149 | | N C |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 | www.discountenergygroup.com | ACTIVE |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 | www.discountenergygroup.com | ACTIVE |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. | www.discountenergygroup.com (866) 275-4240 | ACTIVE R/C |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. d/b/a Dominion Energy | www.discountenergygroup.com (866) 275-4240 | ACTIVE R/C |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Poute 70 West, Suite 125 | www.discountenergygroup.com (866) 275-4240 www.dom.com/products | ACTIVE R/C |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route 70 West, Suite 125 Lakewood, NJ 08701 | www.discountenergygroup.com (866) 275-4240 www.dom.com/products | ACTIVE R/C ACTIVE |
| 811 Church Road, Suite 149Cherry Hill, NJ 08002Dominion Retail, Inc.d/b/a Dominion EnergySolutions395 Route 70 West, Suite 125Lakewood, NJ 08701DTE Energy Supply, Inc. | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 | ACTIVE R/C ACTIVE |
| 811 Church Road, Suite 149Cherry Hill, NJ 08002Dominion Retail, Inc.d/b/a Dominion EnergySolutions395 Route 70 West, Suite 125Lakewood, NJ 08701DTE Energy Supply, Inc.One Gateway Center, | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 | ACTIVE R/C ACTIVE C/I |
| 811 Church Road, Suite 149Cherry Hill, NJ 08002Dominion Retail, Inc.d/b/a Dominion EnergySolutions395 Route 70 West, Suite 125Lakewood, NJ 08701DTE Energy Supply, Inc.One Gateway Center,Suite 2600 | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 www.dtesupply.com | ACTIVE R/C ACTIVE C/I ACTIVE |
| 811 Church Road, Suite 149Cherry Hill, NJ 08002Dominion Retail, Inc.d/b/a Dominion EnergySolutions395 Route 70 West, Suite 125Lakewood, NJ 08701DTE Energy Supply, Inc.One Gateway Center,Suite 2600Newark, NJ 07102 | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 www.dtesupply.com | ACTIVE R/C ACTIVE C/I ACTIVE |
| 811 Church Road, Suite 149Cherry Hill, NJ 08002Dominion Retail, Inc.d/b/a Dominion EnergySolutions395 Route 70 West, Suite 125Lakewood, NJ 08701DTE Energy Supply, Inc.One Gateway Center,Suite 2600Newark, NJ 07102Energy Plus Holdings LLC | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 www.dtesupply.com (877) 866-9193 | ACTIVE R/C ACTIVE C/I ACTIVE R/C |
| 811 Church Road, Suite 149Cherry Hill, NJ 08002Dominion Retail, Inc.d/b/a Dominion EnergySolutions395 Route 70 West, Suite 125Lakewood, NJ 08701DTE Energy Supply, Inc.One Gateway Center,Suite 2600Newark, NJ 07102Energy Plus Holdings LLC309 Fellowship Road | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 www.dtesupply.com (877) 866-9193 | ACTIVE R/C ACTIVE C/I ACTIVE R/C |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route 70 West, Suite 125 Lakewood, NJ 08701 DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102 Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 www.dtesupply.com (877) 866-9193 | ACTIVE R/C ACTIVE C/I ACTIVE R/C |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route 70 West, Suite 125 Lakewood, NJ 08701 DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102 Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054 | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 www.dtesupply.com (877) 866-9193 www.energypluscompany.com | ACTIVE R/C ACTIVE C/I ACTIVE R/C ACTIVE |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route 70 West, Suite 125 Lakewood, NJ 08701 DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102 Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054 Energy.me Midwest LLC | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 www.dtesupply.com (877) 866-9193 www.energypluscompany.com (855) 243-7270 | ACTIVE R/C ACTIVE C/I ACTIVE R/C ACTIVE R/C/I |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route 70 West, Suite 125 Lakewood, NJ 08701 DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102 Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054 Energy.me Midwest LLC 90 Washington Blvd | www.discountenergygroup.com (866) 275-4240 www.dom.com/products (877) 332-2450 www.dtesupply.com (877) 866-9193 www.energypluscompany.com (855) 243-7270 | ACTIVE R/C ACTIVE C/I ACTIVE R/C ACTIVE R/C/I |
| 811 Church Road, Suite 149 Cherry Hill, NJ 08002 Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route 70 West, Suite 125 Lakewood, NJ 08701 DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102 Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054 Energy.me Midwest LLC 90 Washington Blvd Bedminster, NJ 07921 | www.discountenergygroup.com(866) 275-4240www.dom.com/products(877) 332-2450www.dtesupply.com(877) 866-9193www.energypluscompany.com(855) 243-7270www.energy.me | ACTIVE R/C ACTIVE C/I ACTIVE R/C ACTIVE R/C/I ACTIVE |
| Ethical Electric Benefit Co. | (888) 444-9452 | R/C |
|---|--|--|
| d/b/a Ethical Electric | www.athiaalalaatria.com | |
| Princeton, NJ 08540 | www.etificatelectric.com | ACTIVE |
| FirstEnergy Solutions Corn | (800) 977-0500 | СЛ |
| 300 Madison Avenue | (800) 777-0300 | C/I |
| Morristown, NJ 07962 | | |
| | www.fes.com | ACTIVE |
| Gateway Energy Services | (800) 805-8586 | R/C/I |
| Corp. | | |
| 44 Whispering Pines Lane | | |
| Lakewood, NJ 08701 | www.gesc.com | ACTIVE |
| GDF SUEZ Energy Resources | (866) 999-8374 | C/I |
| NA, Inc. | | |
| 333 Thornall Street | | |
| Sixth Floor | www.adfauazanananananananan | |
| Edison, NJ 08819 | www.gdfsuezenergyresources.com | ACTIVE |
| Glacial Energy of New Jersey, | (888) 452-2425 | C/I |
| The | | |
| 75 Koule 15 Building E Lafavette NL 07848 | www.glacialenergy.com | ACTIVE |
| Larayette, NJ 07040 | www.graciarchergy.com | ACTIVE |
| Croon Mountain Energy | (866) 767-5818 | СЛ |
| U GICCH MUUIILAIII EIlergy | (000)/0/-3010 | U/I |
| Company | (666) 707-5618 | C/I |
| Company 211 Carnegie Center Drive | (000) 707-5010 | C/I |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 | www.greenmountain.com/commercial- | ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 | www.greenmountain.com/commercial- home | ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation | www.greenmountain.com/commercial- home (800) 437-7872 | ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza | www.greenmountain.com/commercial- home (800) 437-7872 | ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 | www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com | ACTIVE C/I ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC | www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 | ACTIVE C/I ACTIVE R/C |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road | (800) 707-5818 www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 | ACTIVE C/I ACTIVE R/C |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666 | (800) 707-5010 www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com | ACTIVE C/I ACTIVE R/C ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666 HOP Energy, LLC d/b/a | www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (877) 390-7155 | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I |
| Company211 Carnegie Center DrivePrinceton, NJ 08540Hess Corporation1 Hess PlazaWoodbridge, NJ 07095HIKO Energy, LLC655 Suffern RoadTeaneck, NJ 07666HOP Energy, LLC d/b/aMetro Energy, HOP Fleet | (800) 707-5313 www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (877) 390-7155 | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666 HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet E u iii | www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (877) 390-7155 | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666 HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Averue | www.greenmountain.com/commercial- home(800) 437-7872www.hess.com(888) 264-4908www.hikoenergy.com(877) 390-7155www.hopenergy.com | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666 HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Bidgefield NL 07657 | www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (877) 390-7155 www.hopenergy.com | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I ACTIVE |
| Company211 Carnegie Center DrivePrinceton, NJ 08540Hess Corporation1 Hess PlazaWoodbridge, NJ 07095HIKO Energy, LLC655 Suffern RoadTeaneck, NJ 07666HOP Energy, LLC d/b/aMetro Energy, HOP FleetFueling, HOP Energy FleetFueling, HOP Energy FleetFueling1011 Hudson AvenueRidgefield, NJ 07657 | (800) 707-5313 www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (877) 390-7155 www.hopenergy.com | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666 HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Ridgefield, NJ 07657 | www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (877) 390-7155 www.hopenergy.com | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666 HOP Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Ridgefield, NJ 07657 IDT Energy. Inc. | (800) 707-5313 www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (877) 390-7155 www.hopenergy.com (973) 438-4380 | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I ACTIVE |
| Company 211 Carnegie Center Drive Princeton, NJ 08540 Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095 HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666 HOP Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Ridgefield, NJ 07657 IDT Energy, Inc. 550 Broad Street | (800) 707-5818 www.greenmountain.com/commercial- home (800) 437-7872 www.hess.com (888) 264-4908 www.hikoenergy.com (877) 390-7155 www.hopenergy.com (973) 438-4380 | ACTIVE C/I ACTIVE R/C ACTIVE R/C/I ACTIVE R/C/I |

| Independence Energy Group, | (877) 235-6708 | R/C |
|--|-------------------------------|--------|
| LLC 211 Cornegio Conter | www.chooseindenendence.com | ACTIVE |
| Princeton, NJ 08540 | www.enoosenacpenachee.com | ACTIVE |
| Integrys Energy Services, Inc. | (877) 763-9977 | С/І |
| 99 Wood Ave, South, Suite 802 | | |
| Iselin, NJ 08830 | • . | |
| | www.integrysenergy.com | ACTIVE |
| Liberty Power Delaware, LLC | (866) 769-3799 | R/C/I |
| 3000 Atrium Way | | |
| Suite 273 | www.libertypowercorp.com | |
| Mt. Laurel, NJ 08054 | | ACTIVE |
| Liberty Power Holdings, LLC | (866) 769-3799 | R/C/I |
| 3000 Atrium Way | | |
| Mt Laurel NI 08054 | www.libertypowercorp.com | ACTIVE |
| Linde Energy Services | (800) 247-2644 | СЛ |
| 575 Mountain Avenue | | 0/1 |
| Murray Hill, NJ 07974 | | |
| | www.linde.com | ACTIVE |
| Marathon Power LLC | (888) 779-7255 | R/C/I |
| 302 Main Street | | |
| Paterson, NJ 07505 | <u>www.mecny.com</u> | ACTIVE |
| NATGASCO, Inc. 532 Ereeman St | (973) 678-1800 x. 251 | R/C |
| Orange, NJ 07050 | www.supremeenergvinc.com | ACTIVE |
| NextEra Energy Services New | (877) 528-2890 Commercial | |
| Jersey, LLC | (800) 882-1276 Residential | |
| 651 Jernee Mill Road | | |
| Sayreville, NJ 08872 | www.nexteraenergyservices.com | ACTIVE |
| NJ Gas & Electric | (866) 568-0290 | R/C/I |
| I Bridge Plaza fl.2 Fort Lee NL 07024 | www.NIGandE.com | ACTIVE |
| Noble American Energy | (877) 273 6772 | |
| Solutions | (877) 273-0772 | C/I |
| The Mac-Cali Building | | |
| 581 Main Street, 8th Floor | www.noblesolutions.com | ACTIVE |
| Woodbridge, NJ 07095 | | |
| North American Power and | (888) 313-9086 | R/C/I |
| Gas, LLC 222 Pidgedale Ave | | |
| Cedar Knolls, NJ 07927 | www.napower.com | ACTIVE |
| | | |

| Palmco Power NJ, LLC | (877) 726-5862 | R/C/I |
|---|-----------------------------|-----------------|
| One Greentree Centre | | |
| 10,000 Lincoln Drive East, | | |
| Suite 201 Marlton NI 08053 | www.PalmcoEnergy.com | ACTIVE |
| Banga Enorgy Sources Inc. | (800) ENERCY 0 (262 7400) | |
| 112 Main St | (800) ENERG I -9 (303-7499) | K/C |
| Lebanon, NJ 08833 | | |
| | www.pepco-services.com | ACTIVE |
| Plymouth Rock Energy, LLC | (855) 32-POWER (76937) | R/C/I |
| 338 Maitland Avenue | | |
| Teaneck, NJ 07666 | www.plymouthenergy.com | ACTIVE |
| | | |
| PPL EnergyPlus, LLC | (800) 281-2000 | C/I |
| 811 Church Road | | |
| Cherry Hill, NJ 08002 | | ACTIVE |
| | www.pplenergyplus.com | |
| Public Power & Utility of New | (888) 354-4415 | R/C/I |
| Jersey, LLC | | |
| 39 Old Ridgebury Rd. Suite 14 | www.ppondu.com | ACTIVE |
| Dalibury, C1 00810 | <u>www.ppandu.com</u> | |
| 211 Carnegie Center | (877) 297-3780 | K/C/I ACTIVE |
| Princeton NI 08540 | www.reliant.com/pim | ACTIVE |
| ResCom Energy LLC | (888) 238-4041 | |
| 18C Wave Crest Ave. | (000) 250-4041 | N/C/1 |
| Winfield Park, NJ 07036 | http://rescomenergy.com | ACTIVE |
| | | |
| Respond Power LLC | (877) 973-7763 | R/C/I |
| 10 Regency CT | | |
| Lakewood, NJ 08701 | www.respondpower.com | ACTIVE |
| South Jersey Energy | (800) 800-266-6020 | C/I |
| Company | | |
| 1 South Jersey Plaza | | |
| Route 54 | | |
| Folsom, NJ 08037 | www.southjerseyenergy.com | ACTIVE |
| Sperian Energy Corp. | (888) 682-8082 | R/C/I |
| 1200 Route 22 East, Suite 2000 Pridgewater, NL 08807 | | ACTIVE |
| Blidgewater, NJ 08807 | | |
| Starion Energy PA Inc. | (800) 600-3040 | K/C/I |
| Hawthorne NL 07506 | www.starionenergy.com | ACTIVE |
| 11aw morne, 113 07300 | | ACTIVE |

| Stream Energy | (877) 369-8150 | R |
|-----------------------------|---------------------------|--------|
| 309 Fellowship Road | | |
| Suite 200 | | |
| Mt. Laurel, NJ 08054 | www.streamenergy.net | ACTIVE |
| UGI Energy Services, Inc. | (856) 273-9995 | C/I |
| d/b/a GASMARK | | |
| 224 Strawbridge Drive | | |
| Suite 107 | | |
| Moorestown, NJ 08057 | www.ugienergyservices.com | ACTIVE |
| Verde Energy USA, Inc. | (800) 388-3862 | R/C/I |
| 50 East Palisades Avenue | | |
| Englewood, NJ 07631 | www.lowcostpower.com | ACTIVE |
| Viridian Energy | (866) 663-2508 | R/C/I |
| 2001 Route 46 | | |
| Waterview Plaza | | |
| Suite 310 | | |
| Parsippany, NJ 07054 | www.viridian.com | ACTIVE |
| Xoom Energy New Jersey, | (888)997-8979 | R/C/I |
| LLC | | |
| 744 Broad Street | | |
| Newark, NJ 07102 | www.xoomenergy.com | ACTIVE |
| YEP Energy | (855) 363-7736 | R/C/I |
| 89 Headquarters Plaza North | | |
| #1463 | www.yepenergyNJ.com | ACTIVE |
| Morristown, NJ 07960 | | |
| Your Energy Holdings, LLC | (855) 732-2493 | R/C/I |
| One International Boulevard | | |
| Suite 400 | www.thisisyourenergy.com | ACTIVE |
| Mahwah, NJ 07495-0400 | | |

APPENDIX B

Equipment Inventory

| Description | QTY | Manufacturer Name | Model No. | Serial No. | Equipment Type / Utility | Capacity/Size /Efficiency | Location | Areas/Equipment Served | Date Installed | Remaining Useful Life (years) |
|---------------------|-----|---|-----------------------|---------------|----------------------------------|---|---------------------------------------|---------------------------|--|--------------------------------------|
| Boiler B-1 | 1 | H.B. Smith | series 28, 6 sections | N/A | HVAC/HW Heating | 1,139,100 BTUH | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1978 | 0 |
| Boiler B-2 | 1 | H.B. Smith | series 28, 6 sections | N/A | HVAC/HW Heating | 1,139,100 BTUH | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1978 | 0 |
| Oil Burner 1 | 1 | Carlin | 800CRD | N/A | HVAC/HW Heating | 11.40-19.80 GPH No. 2 Fuel Oil | Boiler Rm 1978 Orig. Bldg. | 1978 Building | N/A | |
| Oil Burner 2 | 1 | Carlin | 800CRD | N/A | HVAC/HW Heating | 11.40-19.80 GPH No. 2 Fuel Oil | Boiler Rm 1978 Orig. Bldg. | 1978 Building | N/A | |
| EXP-1 | 1 | Amtrol | Extrol AX-120V | N/A | HVAC/HW Heating | 125 Psi | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1979 | 0 |
| Oil Pump 1 | 1 | ICA | J-40 | N/A | HVAC/HW Heating | 1/3 HP / 40 GPH / No. 2 Fuel Oil | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1978 | -15 |
| Oil Pump 2 | 1 | ICA | J-40 | N/A | HVAC/HW Heating | 1/3 HP / 40 GPH / No. 2 Fuel Oil | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1978 | -15 |
| CP-1 | 1 | Bell & Gossett | 4" AB Base Mtd. | N/A | HVAC/HW Heating | 5 HP / 250 GPM @ 40' TDH | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1978 | -15 |
| CP-2 | 1 | Bell & Gossett | 4" AB Base Mtd. | N/A | HVAC/HW Heating | 5 HP / 250 GPM @ 40' TDH | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1978 | -15 |
| DHW-1 | 1 | Bock | 361E ASME | 05093128P | DHW Heating | 113 gal / 442 GPH @ 90°F rise | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1998 | 0 |
| Storage tank 1 | 1 | A.O. Smith | T500A | 770-B79-79701 | DHW Heating | 500 gal | Boiler Rm 1978 Orig. Bldg. | 1978 Building | 1978 | -15 |
| AHU-1 | 1 | Brundage fan / Flo-Con Energy Recovery Wheel | BI-18 / FC-60 | N/A | HVAC/HW Heating | 2200 CFM / 3/4 HP / 1/4 HP ERW | 1978 Mechanical Rm West | 1978 Classrooms | 1978 | -15 |
| AHU-2 | 1 | Brundage fan / Flo-Con Energy Recovery Wheel | BI-18 / FC-60 | N/A | HVAC/HW Heating | 11,700 CFM / 5 HP / 1/4 HP ERW | 1978 Mechanical Rm West | 1978 Cafeteria | 1978 | -15 |
| AHU-3 | 1 | Brundage fan / Flo-Con Energy Recovery Wheel | BI-18 / FC-60 | N/A | HVAC/HW Heating | 3,200 CFM / 1.5 HP / 1/4 HP ERW | 1978 Mechanical Rm above Boiler Rm | 1978 Classrooms | 1978 | -15 |
| CH-1 | 72 | Dunham Bush | BU-4 | N/A | HVAC/HW Heating | 250 CFM / 3.4 MBH / 60 W / 208- 3-60 | 1978 Classrooms | 1978 Classrooms | 1978 | -15 |
| CH-2 | 4 | Dunham Bush | BU-4 | N/A | HVAC/HW Heating | 250 CFM / 5.0 MBH / 60 W / 208- 3-60 | 1978 Hallways | 1978 Hallways | 1978 | -15 |
| HVAC-1 Fan Coil | 1 | Trane | BH-70 | N/A | HVAC/HW Heating & DX Cooling | 2700 CFM / 1 HP / 208-1-60 | 1978 Office | 1978 Offices | 2002 | 4 |
| HVAC-2 Fan Coil | 1 | Trane | BANB | N/A | HVAC/HW Heating & DX Cooling | 1420 CFM / 1/2 HP / 120-1-60 | 1978 Office | 1978 Office | 2002 | 4 |
| Air Compressor | 1 | N/A | N/A | N/A | HVAC Controls/Electric | 3 phase 208v | N/A | 1978 Building | N/A | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Boiler B-1 | 1 | H.B. Smith | series 28A-5 | N2002-N28 | HVAC/HW Heating | 1,014,000 BTUH | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 24 |
| Boiler B-2 | 1 | H.B. Smith | series 28A-5 | N2002-N28 | HVAC/HW Heating | 1,014,000 BTUH | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 24 |
| FOP-1 | 1 | Preferred Utilities | FPL-17 | N/A | HVAC/HW Heating | 3/4 HP / 10.4 GPH / No. 2 Fuel oil | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 9 |
| FOP-2 | 1 | Preferred Utilities | FPL-17 | N/A | HVAC/HW Heating | 3/4 HP / 10.4 GPH / No. 2 Fuel oil | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 9 |
| ET-1 Expansion Tank | 1 | Bell & Gossett | B-200 | N/A | HVAC/HW Heating | Accept. Vol. = 53 gal / 125 Psi | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 24 |
| P-1 | 1 | Bell & Gossett | series 1510 2BC | N/A | HVAC/HW Heating | 7.5 HP / 175 GPM @ 75 TDH | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 9 |
| P-2 | 1 | Bell & Gossett | series 1510 2BC | N/A | HVAC/HW Heating | 7.5 HP / 175 GPM @ 75 TDH | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 9 |
| DHW-1 | 1 | A.O. Smith | Cat. # DSE 80 | N/A | DHW Heating | 18 kw / 100 gal / 74 GPH @ 100°F rise | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 4 |
| AC-1 | 1 | Airedale | SCX5 | N/A | HVAC/HW Heating & DX Cooling | 2000 cfm / 75 MBH heat / 5 tons cooling | 2002 Classroom | 2002 Classroom | 2002 | 4 |
| AC-2 | 1 | Airedale | SCX5 | N/A | HVAC/HW Heating & DX Cooling | 2000 cfm / 75 MBH heat / 5 tons cooling | 2002 Classroom | 2002 Classroom | 2002 | 4 |
| AC-3 | 1 | Airedale | SCX5 | N/A | HVAC/HW Heating & DX Cooling | 2000 cfm / 75 MBH heat / 5 tons cooling | 2002 Classroom | 2002 Classroom | 2002 | 4 |
| AC-4 | 1 | Airedale | SCX5 | N/A | HVAC/HW Heating & DX Cooling | 1200 cfm / 35 MBH heat / 3 tons cooling | 2002 Classroom | 2002 Classroom | 2002 | 4 |
| AC-5 | 1 | Airedale | SCX5 | N/A | HVAC/HW Heating & DX Cooling | 1600 cfm / 60 MBH heat / 3.5 tons cooling | 2002 Classroom | 2002 Classroom | 2002 | 4 |
| AC-6 | 1 | Airedale | SCX5 | N/A | HVAC/HW Heating & DX Cooling | 2000 cfm / 75 MBH heat / 5 tons cooling | 2002 Classroom | 2002 Classroom | 2002 | 4 |
| AC-7 | 1 | Airedale | SCX5 | N/A | HVAC/HW Heating & DX Cooling | 2000 cfm / 75 MBH heat / 5 tons cooling | 2002 Classroom | 2002 Classroom | 2002 | 4 |
| RTU-1 | 1 | Carrier | 50HJ014 | N/A | HVAC/ DX Cooling Rooftop unit | 3840 cfm / 11 tons cooling | 2002 Addition CST | 2002 Addition Ap | 2002 pendix B-Equip Inve Conley Elem | 4 ntory - Conley entary School |

| Description | QTY | Manufacturer Name | Model No. | Serial No. | Equipment Type / Utility | Capacity/Size /Efficiency | Location | Areas/Equipment Served | Date Installed | Remaining Useful Life (years) |
|---|-----|-------------------|---|------------|--|---|-----------------------------------|---------------------------|----------------|----------------------------------|
| RTU-2 | 1 | Carrier | 50HJ008 | N/A | HVAC/ DX Cooling Rooftop unit | 2850 cfm / 7 tons cooling | 2002 Addition Computer Lab 132 | 2002 Addition | 2002 | 4 |
| RTU-3 | 1 | Carrier | 50HJ007 | N/A | HVAC/ DX Cooling Rooftop unit | 2410 cfm / 6 tons cooling | 2002 Addition SGI 103 | 2002 Addition | 2002 | 4 |
| RTU-4 | 1 | Carrier | 50HJ014 | N/A | HVAC/ DX Cooling Rooftop unit | 2795 cfm / 6 tons cooling | 2002 Addition SGI 102 | 2002 Addition | 2002 | 4 |
| RTU-5 | 1 | Carrier | 50HJ014 | N/A | HVAC/ DX Cooling Rooftop unit | 2645 cfm / 11 tons cooling | 2002 Addition CR 107 | 2002 Addition | 2002 | 4 |
| RTU-6 | 1 | Carrier | 50HJ015 | N/A | HVAC/ DX Cooling Rooftop unit | 4000 cfm / 12 tons cooling | 2002 Addition Gym 112 | 2002 Addition | 2002 | 4 |
| RTU-7 | 1 | Carrier | 50HJ017 | N/A | HVAC/ DX Cooling Rooftop unit | 4500 cfm / 14 tons cooling | 2002 Addition Gym 112 | 2002 Addition | 2002 | 4 |
| CAC-1 Fan Coil unit CACCU-1 Condensing unit | 1 | Airedale | CAC-14 indoor unit SCC-12 outdoor unit | N/A | HVAC/ DX Cooling Split System units | 510 cfm / 8 MBH heat / 1 ton cooling | 2002 Addition Gym Office | 2002 Addition | 2002 | 4 |
| BMS | 1 | Barber Coleman | | | HVAC Controls/Electric | 3 phase 208v | Boiler Rm 2002 Addition | 2002 Addition | 2002 | 4 |
| | | | | | | | | | | |
| | | | | | | | | | | |

Appendix B-Equip Inventory - Conley Conley Elementary School

Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735 Existing Lighting

| | | | | | EXISTING | | ONS | | | | | |
|-------|--|------------------------|------------|--|-----------------------------|------------|----------------------------|------------------|---------------|----------|----------------|-------|
| | | | | | | | | | | | | |
| | | | No. of | | | Watts per | | | Annual | Retrofit | Annual | |
| | Area Description | Usage | Fixtures | Standard Fixture Code | NYSERDA Fixture Code | Fixture | kW/Space | Exist Control | Hours | Control | kWh | |
| Field | Linique description of the location - Room | | No. of | "Lighting Fixture Code" Example | Code from Table of Standard | Value from | (Watte/Fixt) * | Bro-inst control | Estimated | Potrofit | (k)N/(space) * | Notoo |
| Code | number/Room name: Eloor number (if applicable) | Using Operating Hours | fixtures | $2T 40 \text{ R F(II)} = 2'x^2' \text{ Troff 40 w Recess Floor 2}$ | Fixture Wattages | Table of | (Walls/Fixt) (Fixt No.) | device | annual hours | control | (Annual | Notes |
| Coue | number/recommander noor number (ir applicable) | using operating riours | before the | lamps U shape | | Standard | (11,11,11,10.) | device | for the usage | device | Hours) | |
| | | | retrofit | | | Fixture | | | group | 401100 | i lo di o) | |
| | | | | | | Wattages | | | 9. o a p | | | |
| 11 | Doorway - 3 | Hallways | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.07 | SW | 2280 | SW | 164 | |
| 11 | Old Hallway | Hallways | 44 | S 34 P F 2 (MAG) | F42EE | 72 | 3.17 | SW | 2280 | SW | 7,223 | |
| 6 | Room 106 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | 000 | 3,110 | |
| 11 | Room 106 | Classrooms | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.29 | SW | 2400 | OCC | 691 | |
| 6 | Room 105 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | OCC | 3,110 | |
| 11 | Room 105 | Classrooms | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.29 | SW | 2400 | OCC | 691 | |
| 6 | Room104 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | OCC | 3,110 | |
| 11 | Room 104 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | OCC | 1,037 | |
| 6 | Room 103 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | OCC | 3,110 | |
| 11 | Room 103 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | OCC | 1,037 | |
| 6 | Room 102 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | OCC | 3,110 | |
| 11 | Room 102 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | OCC | 1,037 | |
| 11 | Doorway - 4 | Hallways | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.07 | SW | 2280 | SW | 164 | |
| 71 | North Custodial Closet | Storage Areas | 1 | 1 60 | I60/1 | 60 | 0.06 | SW | 1000 | SW | 60 | |
| 11 | Boy's Bathroom | Bath Room | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.29 | SW | 500 | SW | 144 | |
| 11 | Girl's Bathroom | Bath Room | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.29 | SW | 500 | SW | 144 | |
| 6 | Room 101 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | 000 | 3,110 | |
| 11 | Room 101 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | 000 | 1,037 | |
| 6 | Library | Classrooms | 22 | T 34 R F 4 (MAG) | F44EE | 144 | 3.17 | SW | 2400 | C-0CC | 7,603 | |
| 11 | Library Server Room | Storage Areas | 2 | S 34 P F 2 (MAG) | F42EE | 72 | 0.14 | SW | 1000 | SW | 144 | |
| 6 | Room 116 | Classrooms | 12 | T 34 R F 4 (MAG) | F44EE | 144 | 1.73 | SW | 2400 | 000 | 4,147 | |
| 11 | Room 116 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | OCC | 1,037 | |
| 6 | Room 115 | Classrooms | 12 | T 34 R F 4 (MAG) | F44EE | 144 | 1.73 | SW | 2400 | OCC | 4,147 | |
| 11 | Room 115 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | OCC | 1,037 | |
| 11 | Boiler Room - 1 | Storage Areas | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 1000 | SW | 432 | |
| 11 | Nurse | Offices | 3 | S 34 P F 2 (MAG) | F42EE | 72 | 0.22 | SW | 2400 | OCC | 518 | |
| 78 | Nurse | Offices | 1 | EP I 100 | l100/1 | 100 | 0.10 | SW | 2400 | 000 | 240 | |
| 11 | Nurse | Offices | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.07 | SW | 2400 | 000 | 173 | |
| 11 | Nurse | Offices | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.29 | SW | 2400 | 000 | 691 | |
| 71 | Nurse | Offices | 1 | 160 | 160/1 | 60 | 0.06 | SW | 2400 | 000 | 144 | |
| 6 | Room 122 | Classrooms | 2 | T 34 R F 4 (MAG) | F44EE | 144 | 0.29 | SW | 2400 | 0000 | 691 | |
| 11 | Custodian Office | Offices | 3 | S 34 P F 2 (MAG) | F42EE | 72 | 0.22 | SW | 2400 | SW | 518 | |
| 6 | Room 114 | Classrooms | 2 | 1 34 R F 4 (MAG) | | 144 | 0.29 | SW | 2400 | 000 | 691 | |
| 6 | Superintendent Office | Offices | 4 | 1 34 K F 4 (MAG) | | 144 | 0.58 | SW | 2400 | | 1,382 | |
| 0 | Board of Education Room | Offices | 4 | 1 34 K F 4 (MAG) | | 144 | 0.58 | SVV | 2400 | | 1,382 | |
| 11 | Business Administrator | Offices | 3 | 334 F F 2 (IVIAG) | | 12 | 0.22 | SVV | 2400 | | 518 | |
| 0 | Business Administrator | Offices | 4 | | | 144 | 0.58 | | 2400 | | 1,382 | |
| | | Classroome | 3 | | | 12 | 0.22 | | 2400 | | 010 2 110 | |
| 11 | | | 9 | | | 70 | 0.42 | | 2400 | | 3,110 | |
| | Room 112 | Classroome | ٥ ٥ | $T_{34} R F_4 (MAC)$ | | 144 | 1 20 | | 2400 | | 2 110 | |
| 11 | Room 112 | Classroome | 6 | | | 70 | 0.42 | SW SW | 2400 | | 1 027 | |
| Q II | | Cafataria | 10 | MH 175 | | 215 | 2 97 | SW SW | 1600 | | F 102 | |
| 11 | Kitchon | Cafeteria | 15 | S 34 P F 2 (MAG) | | 72 | 1 08 | SW/ | 1600 | | 1 72 | |
| 71 | Walk-in Freezer | Storane Areas | 1 | | | 60 | 0.0 | SW SW/ | 1000 | <u> </u> | 1,720 | |
| 71 | Walk-in Freezer | Storage Areas | 1 | 1.60 | I60/1 | 60 | 0.00 | SW/ | 1000 | SW | 00 | |
| 6 | Room 111 | Classrooms | ۰ ۵ | T 34 R F 4 (MAG) | | 144 | 1 30 | SW/ | 2400 | 000 | 3 110 | |
| 11 | Room 111 | Classrooms | 6 | S 34 P F 2 (MAG) | F42FF | 72 | 0.43 | SW | 2400 | 000 | 1 037 | |
| 6 | Room 112 | Classrooms | 9 | T 34 R F 4 (MAG) | F44FF | 144 | 1 30 | SW | 2400 | 000 | 3 110 | |
| 11 | Room 112 | Classrooms | 6 | S 34 P F 2 (MAG) | F42FF | 72 | 0.43 | SW | 2400 | 000 | 1 037 | |
| 6 | Room 110 | Classrooms | 9 | T 34 R F 4 (MAG) | F44FF | 144 | 1.30 | SW | 2400 | 220 | 3 110 | |
| 11 | Room 110 | Classrooms | 6 | S 34 P F 2 (MAG) | F42FF | 72 | 0.43 | SW | 2400 | 222 | 1 037 | |
| | | 0.0.00100110 | | | | 1 12 | 1 0.70 | | | | 1,007 | |

Cost of Electricity:





Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735 Existing Lighting

| No.8 No.8 No | | | | | | EXISTING | | ONS | | | | | |
|---|---------------|---|--|--|--|--|---|------------------------------|-----------------------------|---|-------------------------------|-----------------------------------|-------|
| Field Uncome area to work and any and any and any | | Area Description | Usage | No. of Fixtures | Standard Fixture Code | NYSERDA Fixture Code | Watts per Fixture | kW/Space | Exist Control | Annual Hours | Retrofit Control | Annual kWh | |
| 6 Base 109 Classors 9 73 h R F 40%3 FL4CE 144 1.0.3 897 2400 CCC 31 o 14 Exercitor Classors 6 5 k P F 2003 FL4CE 144 1.0.3 897 2400 CCC 1100 14 Reservice Classors 6 5 k P F 2003 FL4CE 144 153 897 2400 CCC 1100 14 Reservice Classors 6 5 k P F 2003 FL4CE 144 153 897 2400 CCC 1100 16 Concester Concester 0 T M F AdvSc FL4CE 144 1.43 897 2400 CCC 3.58 21 Main Oke Officer 0 T M F AdvSc FL4CE 144 1.44 1.44 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 | 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" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floc lamps U shape | Code from Table of Standard or 2 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 |
| 11 Room 168 Classoons 6 8 > P 2 4 MAC F2CE T2 0.63 SW 2000 CCC 1.10 4 Control 15 Classoons 6 1 > M P 4 MAC FECE T2 0.63 SW 2000 CCC 3.110 6 Room 157 Classoons 6 3 > FF 2 MAC FF 4 ER 144 3.20 SW 2000 CCC 3.110 6 Room 157 Classoons 6 3 > FF 2 MAC FF 4 ER 144 1.24 800 1000 CCC 3.10 7 Classoons G 3 > FF 2 MAC FF 2 MAC FF 4 MAC FF 4 MAC 101 104 104 104 104 104 100 CCC 1.00 87 Man Extremo M selessoon G 75 R 7 4 CLD FF 4 LL2 60 0.58 87 200 100 100 84 Man Extremo Samp Assa Samp Assa Sam 7 2 CLD FE 4 LL2 60 | 6 | Room 109 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | OCC | 3,110 | |
| 6 Rom 104 Caseborn 6 T 54 (F 41 MAG) FridE 1/4 1.30 SW 20.0 CCC 3.10 1 Common Caseborn 6 SWF 12 MAG) FridE 7.4 1.40 SW 20.00 CCC 1.10 1 Down 107 Caseborn 6 SWF 12 MAG) FridE 7.2 0.43 SW 20.00 CCC 1.307 1 Down 107 Caseborn 6 SWF 12 MAG FridE 7.2 0.43 SW 20.00 CCC 1.307 8 Date The Caseborn 0 SWF 14 MAG FridE 7.4 1.4 SWF 14 SWF 14< | 11 | Room 109 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | OCC | 1,037 | |
| 11 Root 16 Canadom 6 54 /F 2 (MAC) FV2EE 72 0.43 SW 25:00 0.000 1,037 14 Rane 10 ² Canadom 6 154 /F 2 (MAC) FV2EE 72 0.43 SW 12:00 0.000 1,037 17 Generation Caldemin 18 P1 10 FV2E 72 1,030 14.00 SW 12:00 2:000 | 6 | Room 108 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | 000 | 3,110 | |
| 6 Ren ti? Classoors 9 Tab F 2 MAG F44E 144 1.00 SM 200 OCC A.110 10 Ron tV? Classoors 0 S.17 (MAG) F44E 1.00 SM 200 OCC 3.10 6 Main Emission Pallaga 10 CF112 28 0.26 SM 2800 OCC 3.468 6 Main Emission Pallaga 10 CF14W CF112 28 0.26 SM 2800 OCC 3.468 8 Room 11.0 Classoors 6 T 28 K 2 (S1) F44E 7.40 0.54 SM 2800 OCC 3.488 3 Destaors Baltopa S 28 F 7 (S1) F44L 00 0.54 SM 200 SM 300 SM 300 3 SE F 7 (S1) F44L 100 0.58 SM 200 SM 300 SM 300 3 Mainomiscose Balopa Amis | 11 | Room 108 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | 000 | 1,037 | |
| 11 Roon 107 Classrows 6 SM \neq 2,46,0; F42E 72 0.43 SW 400 0.000 10.97 24 Chartens Calinsian 16 P1 (0,4) 10.04 <th< td=""><td>6</td><td>Room 107</td><td>Classrooms</td><td>9</td><td>T 34 R F 4 (MAG)</td><td>F44EE</td><td>144</td><td>1.30</td><td>SW</td><td>2400</td><td>000</td><td>3,110</td><td></td></th<> | 6 | Room 107 | Classrooms | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.30 | SW | 2400 | 000 | 3,110 | |
| 78 Coloreria Christian Christian Christian Fel 100 1100 100 180 SW 1003 COCC 2880 47 Main Christian Offican 0 T21 M 148 1.80 SW 240 COCC 1.800 38 Room 117 Chasacores 6 T3 R F 3 (EE) F/GALL2 80 0.54 SW 240 COCC 1.284 35 Coronautrus Casacores 6 T3 R F 3 (EE) F/GALL2 80 0.54 SW 2400 COCC 1.984 36 Coronautrus Casacores 6 T3 R F 3 (EE) F/GALL2 80 0.54 SW 2400 COCC 1.984 36 Coronautrus Casacores 0 3.9 F 2 (EE) F/GALL2 80 0.45 SW 1.000 SW </td <td>11</td> <td>Room 107</td> <td>Classrooms</td> <td>6</td> <td>S 34 P F 2 (MAG)</td> <td>F42EE</td> <td>72</td> <td>0.43</td> <td>SW</td> <td>2400</td> <td>000</td> <td>1,037</td> <td></td> | 11 | Room 107 | Classrooms | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.43 | SW | 2400 | 000 | 1,037 | |
| 6 Main Office Office 10 TAR R # 4(MAG) F#4EE 144 1.44 SW 2400 COC 3.46 27 Main Firmtorio Tablings 10 CFUIL 26 260 260 500 260 500 260 500 | 78 | Cafeteria | Cafeteria | 18 | EP I 100 | l100/1 | 100 | 1.80 | SW | 1600 | C-0CC | 2,880 | |
| 257 Men Cataroos Holways 10 CPT1V CPT1V <thcpt1v< th=""> CPT1V CPT1V</thcpt1v<> | 6 | Main Office | Offices | 10 | T 34 R F 4 (MAG) | F44EE | 144 | 1.44 | SW | 2400 | OCC | 3,456 | |
| S6 Report 17 Classmonta 6 T 28 F 3 (LE) Fridul.2 80 0.54 SW 2400 CCC 1.28 35 Report 111 Classmonta 6 T 28 F 3 (LE) Fridul.2 80 0.54 SW 2400 CCC 1.28 36 Concept from Single Areas 9 32 F 2 (LE) Fridul.2 80 0.54 SW 2400 CCC 1.28 37 Pracely Balmon Bahcon 1.6 32 F 2 (LE) Fridul.4 60 0.64 SW 2400 0.CC 1.80 38 Descript form Single Areas 1.5 32 F 2 (LE) Fridul.4 60 0.62 SW 4000 3W 600 31 Actions Stongle Areas 1.5 32 F 2 (LE) Fridul.4 60 0.52 SW 1000 3W 600 33 Actions Sarage Stongle Areas 2.5 32 F 2 (LE) Fridul.4 102 102 100 3W | 257 | Main Entrance | Hallways | 10 | CF11W | CF11/2 | 26 | 0.26 | SW | 2280 | SW | 593 | |
| 35 Room 116 Classoorns 6 T 2x R F 3 (LE) FedUL/2 00 0.04 SW 2400 CCCC 1.208 35 Compate Lobs State 7 3 (LE) FedUL/2 00 0.81 SW 2400 CCCC 1.208 36 Compate Lobs State 7 3 (LE) FedUL/2 00 0.81 SW 2400 CCCC 1.208 37 Physical Education State 7 3 (LE) FedUL/2 00 0.61 SW 2400 CCC 1.08 38 Physical Education flow Official 5 32 P F 2 (LE) FedUL/2 60 0.60 SW 2400 CCC 4.08 31 Balter Room State 7 4 (LE) FedUL/2 FedUL/2 60 0.12 SW 2000 SW 400 33 AftRoom Storage State 7 4 (LE) FedUL/2 60 0.12 SW 2000 CCC 4.03 34 Mach Room Storage State 7 4 (LE) FedUL/2 FedUL/2 | 35 | Room 117 | Classrooms | 6 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.54 | SW | 2400 | OCC | 1,296 | |
| 35 Computer Lab Classborns 9 T 2x F 9 (ELE) P43LL/2 00 0.81 SW 2400 C-CCC 1.44 13 Storage from Storage Arous 3 Storage Arous 3W Participation SW Participation Participation SW Participation SW Participation SW Participation SW Participation SW Participation Participation Participation Participation SW Participation Participation Participation Participation SW Participation Participation Participation <td>35</td> <td>Room 118</td> <td>Classrooms</td> <td>6</td> <td>T 32 R F 3 (ELE)</td> <td>F43ILL/2</td> <td>90</td> <td>0.54</td> <td>SW</td> <td>2400</td> <td>OCC</td> <td>1,296</td> <td></td> | 35 | Room 118 | Classrooms | 6 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.54 | SW | 2400 | OCC | 1,296 | |
| 13 Storage Room Storage Accord 13 Storage Accord 14 Storage Accord 1000 SW 1000 SW 1000 13 Facult Entrophics Bethicson (1) Storage Accord 15 Storage Accord 1000 SW 2000 | 35 | Computer Lab | Classrooms | 9 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.81 | SW | 2400 | C-0CC | 1,944 | |
| 13 Fractive Bathroom 1 52.9 FrALL 60 0.06 SW 000 SW 50 13 Bolos Rum-2 Stanga Acas 10 S2.9 FrALL 60 0.66 SW 400 SW 600 14 Bolos Rum-2 Stanga Acas 10 S2.9 FrALL 60 0.66 SW 400 SW 400 13 Bolos Rum-2 Stanga Acas 10 S2.9 FrALL 60 0.66 SW 400 SW 400 13 Art Room Strage Storage Acas 2 32.9 FrALL 60 0.12 SW 100 SW 400 14 Art Room Strage Storage Acas 6 160 4601 0.0 0.35 SW 200 COCC 8540 15 Mark Room Strage Storage Acas 8 67 WH 200 France FrALL 60 0.12 SW 400 COC 450 1 | 13 | Storage Room | Storage Areas | 3 | S 32 P F 2 (ELE) | F42LL | 60 | 0.18 | SW | 1000 | SW | 180 | |
| 55 Project all Education Officion Offices 55 T 32 R F 3 (ELE) F 42LL 60 0.45 SW 2400 OCC 1,680 13 Bedier Room Storage Areas 2 S 22 F 2 (ELE) F 42LL 60 0.12 SW 1000 SW 1000 13 Bedier Room Obstance 12 SE P 1 (ELE) F 42LL 60 0.12 SW 1000 SW 100 13 Art Room Storage Storage Areas 2 S 22 F 2 (ELE) F 42LL 60 0.12 SW 1000 SW 100 14 Art Room Storage Storage Areas 2 S 22 F 2 (ELE) F 42LL 60 0.12 SW 1000 SW 100 16 Maior Room Obstance 13 R 4 (ELE) F 44LL 112 168 SW 2000 0.CCC 464 18 Music Room Storage Storage Areas 2 S 22 F 2 (ELE) F 44LL 112 0.80 SW | 13 | Faculty Bathroom | Bathroom | 1 | S 32 P F 2 (ELE) | F42LL | 60 | 0.06 | SW | 500 | SW | 30 | |
| 13 Bolur Room -2 Storage Areas 10 8 32 PF 2 (ELE) F42LL 60 0.60 SW 1000 SW 600 13 Electrical Room Storage Areas 12 S3 2 F 2 (ELE) F42LL 60 0.12 SW 1000 SW 100 14 Arroom Storage Storage Areas 12 S3 2 F 2 (ELE) F42LL 100 112 SW 1000 SW 100 13 Arroom Storage Storage Areas 2 S2 P F 2 (ELE) F42LL 100 112 SW 2000 CCC 100 71 Arroom Storage Storage Areas 2 S2 P F 2 (ELE) F42LL 100 0.38 SW 2400 CCC 100 71 Arroom Storage Storage Areas 3 S2 P F 2 (ELE) F42LL 100 0.38 SW 2400 CCC 4.032 73 Mausic Room Classrooms 45 S2 P F 2 (ELE) F42LL 100 0.10 SW 2400 CCC 4.032 74 Mausic Room Storage Storage Areas | 35 | Physical Education Office | Offices | 5 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.45 | SW | 2400 | 000 | 1,080 | |
| 13 Electrical Norm Slorage Areas 2 8 27 P / ELD F44LL 60 0.12 SW 100 SW 120 13 Art Room Gastrooma 15 T X F 4 [ED] F44LL 112 188 SW 1000 SW 120 13 Art Room Storage Storage Areas 2 3 X P F / [ED] F44LL 101 168 SW 1000 SW 120 14 Art Room Storage Storage Areas 2 3 X P F / [ED] F44LL 101 60 0.12 SW 1000 SW 120 15 C Mark Room Gostage Areas 2 3 X P F / [ED] F44LL 112 168 SW 2000 C-CC 1644 18 Music Room Storage Storage Areas 2 3 X P F 2 (ED) F44LL 112 160 SW 2000 C/CC 4.032 18 Room 124 Gastrooms 8 C 72 K F 4 (ED) F44LL 112 0.01 SW 2000 C/CC 2.150 18 Room 124 C Mark Storage | 13 | Boiler Room - 2 | Storage Areas | 10 | S 32 P F 2 (ELE) | F42LL | 60 | 0.60 | SW | 1000 | SW | 600 | |
| 18 Art Noom Classrooms 15 1.32 R+4 (bL) F-44LL 61 112 1.88 SW 2403 COC 4.02 13 Art Room Storage Storage Asas 2 S.22 PT 2 (bL) F42LL 60 0.12 SW 1000 SW 120 13 Art Room Storage Storage Asas 2 S.22 PT 2 (bL) F42LL 60 0.12 SW 1000 SW 120 910 Ant Noon Classrooms 6 100 Room Notation 800 0.03 SW 200 COCC 100 910 Symmastum Cymmastum Gymmastum 40 May Room Notage 800 0.01 10 0.01 SW 200 COCC 100 100 13 Max Room Storage Storage Asas 2 S2 PF 2 (bL) F44LL 112 100 SW 200 COCC 2.10 14 Boyne Sattroom B T3 R F 4 (bL) F44LL 112 1.04 SW 200 COCC 2.16 13 Chalswo/frice | 13 | Electrical Room | Storage Areas | 2 | S 32 P F 2 (ELE) | F42LL | 60 | 0.12 | SW | 1000 | SW | 120 | |
| 13 Art Room Storage Storage Areas 2 S 2 P 2 (ELE) F42L 60 0.12 SW 1000 SW 120 71 Art Room Storage Storage Areas 2 S 2 P 2 (ELE) F42L 60 0.12 SW 1000 SW 120 71 Art Room Storage Classtooms 6 160 60 0.36 SW 2000 C-CC 884 81D Gynnasium Gynnasium Gynnasium F42L 60 0.12 SW 2000 C-CC 18.84 81D Music Room Classtooms 15 T 2 R P 4 (ELE) F44LL 112 1.68 SW 2000 C-CC 4.840 257 Halway 6 Halway 6 T 32 R P 4 (ELE) F44LL 112 0.80 SW 2000 C-CC 2.16 13 Storage Storage Areas T 2 Z R P 4 (ELE) F44LL 112 1.48 SW 2.000 CCC 2.16 13 Storage Areas Storage Areas ST 2 R P 4 (ELE) F44LL 112 1.44 SW< | 18 | Art Room | Classrooms | 15 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.68 | SW | 2400 | 0000 | 4,032 | |
| 13 Art Room Storage Storage Areas 2 Storage Areas 1 F42L 60 0.12 SW 1000 SW 120 9LED Gymnasium Gymnasium 40 High Bay M1200 STeel High MH2001 232 9.28 SW 2000 CCC 64 9LED Gymnasium Gymnasium 40 High Bay M1200 STeel High MH2001 232 9.28 SW 2000 CCC 40.32 13 Music Room Classrooms 15 T32 R F4 (ELE) F44LL 112 168 C.3V 2000 SW 2000 SW 474 16 Child Stury Office Offices 12 R F4 (ELE) F44LL 112 0.90 SW 2400 OCC 3.26 18 Child Stury Office Offices 12 R F4 (ELE) F44LL 112 0.90 SW 2400 OCC 3.26 13 Bays Bathroom Bath Room 4 S 28 F 2 (ELE) F44LL 112 10.4 SW 2400 OCC 3.26 14 Roon 123 Cl | 13 | Art Room Storage | Storage Areas | 2 | S 32 P F 2 (ELE) | F42LL | 60 | 0.12 | SW | 1000 | SW | 120 | |
| Aff Nom Classrooms b 160 | 13 | Art Room Storage | Storage Areas | 2 | S 32 P F 2 (ELE) | F42LL | 60 | 0.12 | SW | 1000 | SW | 120 | |
| 91E0 Cymnasum Gymnasum High Bay Mar 200 Sheet High MH2001 222 9.28 SW 2000 CCCC 18.560 18 Music Room Classrooms 15 T 32 R F 4 [ELE] F44LL 112 1.68 SW 2400 CCC 4.302 13 Music Room Storage Storage Areas 2 S 22 F 2 [ELE] F44LL 112 1.68 SW 2400 CCC 2.150 18 Room 124 Classrooms 8 T 32 R F 4 [ELE] F44LL 112 0.30 SW 2400 OCC 2.160 13 Boys Barboom Bath Room 4 S 32 P F 2 [ELE] F44LL 60 0.06 SW 1000 SW 60 13 Boys Barboom Bath Room 4 S 32 P F 2 [ELE] F44LL 160 0.24 SW 500 SW 120 14 Room 123 Classrooms 7 13 2 R F 4 [ELE] F44LL 112 1.78 SW 2400 | 71 | Art Room | Classrooms | 6 | | I60/1 | 60 | 0.36 | SW | 2400 | | 864 | |
| High Might Room Classrooms 15 1.2 X F 4 (LE) F44LL 112 1.88 SW 2400 OCC 4.102 257 Hallway6 Hallway6 8 CF11W CF11/2 26 0.21 SW 2200 SW 4.102 18 Room 124 Classrooms 8 T.32 R F 4 (LE) F44LL 112 0.90 SW 2400 OCC 2.150 18 Room 124 Classrooms 8 T.32 R F 4 (LE) F44LL 112 1.34 SW 2400 OCC 2.150 13 Storage Area 1 S.32 P F 2 (LE) F44LL 60 0.24 SW 500 SW 120 13 Girl's Bahroom Bath Room 4 S.32 P F 2 (LE) F42LL 60 0.24 SW 500 SW 120 14 Room 123 Classrooms 7 T.32 R F 4 (LE) F44LL 112 1.34 SW 2400 OCC 3.494 | 9LED | Gymnasium | Gymnasium | 40 | High Bay MH 200 35 Feet High | MH200/1 | 232 | 9.28 | SW | 2000 | <u> </u> | 18,560 | |
| 13 Mullic Koom Storage Storage 2 S.W. P 2 (ELE) P42L 60 0.12 SW 100 SW 120 16 Room 124 Classrooms 8 T32 RF4 (ELE) F44LL 112 0.90 SW 2200 OCC 2.150 18 Child Suty Office Offices 12 T32 RF4 (ELE) F44LL 112 0.90 SW 2000 OCC 2.250 13 Storage Storage Areas 1 S.27 PF2 (ELE) F44LL 60 0.06 SW 100 SW 60 13 Boys Bathroom Bath Room 4 S.22 PF2 (ELE) F42LL 60 0.24 SW 500 SW 120 14 Room 122 Classrooms 7 T32 PF2 (ELE) F44LL 112 1.01 SW 2400 OCC 2.419 16 Room 121 Classrooms 13 T32 RF4 (ELE) F44LL 112 1.46 SW 2400 OCC | 18 | Music Room | Classrooms | 15 | 1 32 R F 4 (ELE) | F44ILL | 112 | 1.68 | SW | 2400 | 000 | 4,032 | |
| Z57 Halways Halways 8 OF 11/2 26 0.21 SW 220 SW 444 18 Room 124 Classrooms 8 T 32 R F 4 (ELE) F44LL 112 0.90 SW 2400 OCC 3.226 18 Child Study Office Officos 12 T 32 R F 4 (ELE) F44LL 112 0.90 SW 2400 OCC 3.226 13 Boys Bathroom Bath Room 4 S 32 P F 2 (ELE) F42LL 60 0.24 SW 500 SW 120 13 Girks Bathroom Bath Room 4 S 32 P F 2 (ELE) F42LL 60 0.24 SW 500 SW 120 14 Boys Bathroom Bath Room 4 S 32 P F 2 (ELE) F44LL 112 0.78 SW 2400 OCC 1.81 18 Room 132 Classrooms 13 T 32 R F 4 (ELE) F44LL 112 1.84 SW 2400 OCC 3.226 <td>13</td> <td>Music Room Storage</td> <td>Storage Areas</td> <td>2</td> <td>S 32 P F 2 (ELE)</td> <td>F42LL</td> <td>60</td> <td>0.12</td> <td>SW</td> <td>1000</td> <td>SW</td> <td>120</td> <td></td> | 13 | Music Room Storage | Storage Areas | 2 | S 32 P F 2 (ELE) | F42LL | 60 | 0.12 | SW | 1000 | SW | 120 | |
| 18 Noom 1/24 Classrooms 8 I 32 R F 4 (ELE) F44LL 112 0.90 SW 2400 OCC 2,150 18 Child Study Office Offices 12 T 32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 2,150 13 Boys Bathroom Bath Room 4 S 32 P F 2 (ELE) F42LL 60 0.04 SW 500 SW 120 13 Boys Bathroom Bath Room 4 S 32 P F 2 (ELE) F42LL 60 0.24 SW 500 SW 120 18 Room 123 Classrooms 7 T 32 R F 4 (ELE) F44ILL 112 1.01 SW 2400 OCC 3.494 18 Room 12 Classrooms 13 T 32 R F 4 (ELE) F44ILL 112 1.46 SW 2400 OCC 3.430 18 Room 121 Classrooms 13 T 32 R F 4 (ELE) F44ILL 112 1.34 SW 2400 | 257 | Hallway 6 | Hallways | 8 | | CF11/2 | 26 | 0.21 | SW | 2280 | SW | 474 | |
| 13 Child Study Unices Diffees 12 12 1.4 1.2 1.4 3.2 P 44LL 112 1.4 3.2 P 44LL 60 0.06 SW 1000 SW 60 13 Borys Bathroom Bath Room 4 S.32 P 2 (ELE) F42LL 60 0.24 SW 500 SW 120 13 Girl's Bathroom Bath Room 4 S.32 P 2 (ELE) F42LL 60 0.24 SW 500 SW 120 18 Room 123 Classrooms 7 T 32 R F 4 (ELE) F44LL 112 1.01 SW 2400 OCC 1.88 18 Room 122 Classrooms 13 T 32 R F 4 (ELE) F44LL 112 1.44 SW 2400 OCC 3.28 18 Hallway 5 Hallway 5 Hallway 15 T 32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3.286 18 Hallway 5 Hallway 5 Hallway 5 132 R F 4 (ELE) F44LL 112 1.34 SW | 18 | Room 124 | | 8 | 1 32 R F 4 (ELE) | F44ILL | 112 | 0.90 | SW | 2400 | 000 | 2,150 | |
| 13 Storage Storage Andess 1 5.2 PF 2 (ELE) P42L 60 0.00 SW 100 SW 000 13 Boys Bathroom Bath Room 4 S.22 PF 2 (ELE) F42LL 60 0.24 SW 500 SW 120 13 Gir's Bathroom Bath Room 4 S.22 PF 2 (ELE) F42LL 60 0.24 SW 500 SW 120 13 Gir's Bathroom Bath Room 4 S.22 PF 2 (ELE) F44LL 60 0.24 SW 500 SW 120 14 Room 123 Classrooms 9 T.32 RF 4 (ELE) F44LL 112 1.01 SW 2400 OCC 2.49 18 Room 121 Classrooms 12 T.32 RF 4 (ELE) F44LL 112 1.46 SW 2400 OCC 3.26 18 Halway 5 Halway 15 T.32 RF 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3.226 18 Room 120 Classrooms 12 T.32 RF 4 (ELE) F44LL | 18 | Child Study Office | Offices | 12 | 1 32 R F 4 (ELE) | F44ILL | 112 | 1.34 | SVV | 2400 | | 3,226 | |
| 13 Boys Bathroom Bath Room 4 5.32 PF 2 (ELE) F42LL 00 0.24 SW 500 SW 120 13 Girls Bathroom Bath Room 4 S.32 PF 2 (ELE) F42LL 60 0.24 SW 500 SW 120 18 Room 123 Classrooms 7 T.32 R F 4 (ELE) F44LL 112 0.76 SW 2400 OCC 1.882 18 Room 121 Classrooms 13 T.32 R F 4 (ELE) F44LL 112 1.46 SW 2400 OCC 3.494 18 Room 121 Classrooms 12 T.32 R F 4 (ELE) F44LL 112 1.46 SW 2400 OCC 3.286 18 Room 121 Classrooms 12 T.32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3.286 18 Hallway Hallways 18 T.32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3.226 18 Room 120 Classrooms 12 T.32 R F 4 (E | 13 | Storage | Storage Areas | 1 | | F42LL | 60 | 0.06 | SVV | 1000 | 500 | 60 | |
| 13 Offins Beatmoorn Death Room 14 5.2 pf 7 (ELE) F42LL 00 0.24 SW 500 SW 120 18 Room 123 Classrooms 7 T 32 R F 4 (ELE) F44LL 112 1.01 SW 2400 OCC 2,419 18 Room 122 Classrooms 13 T 32 R F 4 (ELE) F44LL 112 1.01 SW 2400 OCC 2,419 18 Room 121 Classrooms 12 T 32 R F 4 (ELE) F44LL 112 1.46 SW 2400 OCC 3,426 18 Room 121 Classrooms 12 T 32 R F 4 (ELE) F44LL 112 1.68 SW 2400 OCC 3,226 18 Hallway 5 Hallways 18 T 32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3,226 18 Room 120 Classrooms 12 T 32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3,226 18 Room 120 Classrooms 12 T 32 | 13 | Boys Bathroom | Bath Room | 4 | 5 32 P F 2 (ELE) | F42LL | 60 | 0.24 | SVV | 500 | 500 | 120 | |
| ive i | 10 | | | 4 | | | 110 | 0.24 | SVV SVV | 2400 | <u> </u> | 120 | |
| 16 Nominaz Colassionis 5 13 132 14 112 1.01 5.01 24.00 OCC 2.4.15 18 Room 118 K Classrooms 13 T 32 R F 4 (ELE) F44ILL 112 1.46 SW 2400 OCC 3.49 18 Room 121 Classrooms 12 T 32 R F 4 (ELE) F44ILL 112 1.46 SW 2400 OCC 3.49 18 Hallway 5 Hallways 15 T 32 R F 4 (ELE) F44ILL 112 1.46 SW 2400 OCC 3.430 18 Hallway 5 Hallways 18 T 32 R F 4 (ELE) F44ILL 112 1.34 SW 2400 OCC 3.226 18 Room 120 Classrooms 12 T 32 R F 4 (ELE) F44ILL 112 1.34 SW 2400 OCC 3.226 257 Hallway Halways 11 CF11W CF11/2 26 0.29 SW 2400 OCC 8.426 11 Faculty Room Offices 5 S 34 P F 2 | 10 | Room 123 | Classrooms | 7 | T 22 P E 4 (ELE) | | 112 | 0.78 | SW | 2400 | 000 | 1,002 | |
| 18 Room 121 Classioonis 12 T32 R F 4 (ELE) F44LL 112 1.40 SW 2400 OCC 3.28 18 Hallway 5 Hallways 15 T32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3.28 18 Hallway 5 Hallways 15 T32 R F 4 (ELE) F44IL 112 1.34 SW 2280 SW 3.830 18 Hallway Hallways 18 T 32 R F 4 (ELE) F44ILL 112 1.34 SW 2280 SW 4.596 18 Room 120 Classrooms 12 T 32 R F 4 (ELE) F44ILL 112 1.34 SW 2400 OCC 3.226 18 Room 120 Classrooms 12 T 32 R F 4 (ELE) F44ILL 112 1.34 SW 2400 OCC 3.226 18 Room 120 Classrooms 12 T 32 R F 4 (ELE) F44ILL 112 1.34 SW 2400 OCC 3.226 19 Hallway Hallways 11 CF11W | 10 | Room 118 K | | 12 | T 32 R F 4 (FLF) | | 112 | 1.01 | SW SW | 2400 | 000 | 2,419 | |
| 18 Hallways Hallways 15 132 R F4 (ELE) F44ILL 112 1.04 5W 2400 600 3,220 18 Hallways Hallways 15 132 R F4 (ELE) F44ILL 112 1.04 5W 2280 SW 4,596 18 Hallway Hallways 18 T32 R F4 (ELE) F44ILL 112 1.04 SW 2280 SW 4,596 18 Room 120 Classrooms 12 T32 R F4 (ELE) F44ILL 112 1.34 SW 2280 SW 4,596 18 Room 120 Classrooms 12 T32 R F4 (ELE) F44ILL 112 1.34 SW 2400 OCC 3,226 18 Room 119 Classrooms 12 T32 R F4 (ELE) F44ILL 112 1.34 SW 2400 OCC 3,226 19 Hallway Hallways 11 CF11W CF11/2 26 0.29 SW 2280 SW 652 11 Men's Bathroom Bath Room 1 S34 P F 2 (MAG) F4 | 18 | Room 121 | Classrooms | 13 | $T_{32} R F_4 (ELE)$ | | 112 | 1.40 | SW | 2400 | 000 | 3,434 | |
| 18 Hallway Hallways 13 132 KF4 (ELE) FHALL 112 1.00 0.00 22.00 SW 4.000 18 Room 120 Classrooms 12 T 32 R F 4 (ELE) FH4LL 112 2.02 SW 22.00 SW 4.566 18 Room 120 Classrooms 12 T 32 R F 4 (ELE) FH4LL 112 1.34 SW 2400 OCC 3,226 18 Room 119 Classrooms 12 T 32 R F 4 (ELE) FH4LL 112 1.34 SW 2400 OCC 3,226 11 Room 119 Classrooms 11 CF11/W CF11/2 26 0.29 SW 2400 OCC 862 11 Faculty Room Offices 5 S 4 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 36 11 Women's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 43.68 13 Strior Outside 4 S 4 P F 2 (MAG) <th< td=""><td>18</td><td>Hallway 5</td><td>Hallways</td><td>12</td><td>T 32 R F 4 (ELE)</td><td></td><td>112</td><td>1.64</td><td>SW</td><td>2780</td><td>SW</td><td>3,220</td><td></td></th<> | 18 | Hallway 5 | Hallways | 12 | T 32 R F 4 (ELE) | | 112 | 1.64 | SW | 2780 | SW | 3,220 | |
| 18 Room 120 Classrooms 12 T32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3,226 18 Room 119 Classrooms 12 T32 R F 4 (ELE) F44LL 112 1.34 SW 2400 OCC 3,226 257 Hallway Hallways 11 CF11W CF11/2 26 0.29 SW 2280 SW 652 11 Faculty Room Offices 5 S 34 P F 2 (MAG) F42EE 72 0.36 SW 2400 OCC 3,226 11 Men's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.36 SW 2400 OCC 84 11 Women's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 36 11 Women's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 36 33 Exterior Outside 44 MH 175 MH17 | 18 | Hallway | Hallways | 18 | T 32 R F 4 (ELE) | | 112 | 2.02 | SW | 2280 | SW | 4 596 | |
| 18 Room 112 113 SW 2400 OCC 3,226 257 Hallway Hallways 11 CF11W CF11/2 26 0.29 SW 2280 SW 652 11 Faculty Room Offices 5 S 4 P F 2 (MAG) F42EE 72 0.36 SW 2400 OCC 864 11 Men's Bathroom Bath Room 1 S 4 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 36 11 Women's Bathroom Bath Room 1 S 4 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 4368 SW 41,321 73 Exterior Outside 16 120 1120/1 120 <td>18</td> <td>Room 120</td> <td>Classrooms</td> <td>10</td> <td>T 32 R F 4 (ELE)</td> <td></td> <td>112</td> <td>1.34</td> <td>SW</td> <td>2200</td> <td>000</td> <td>3 226</td> <td></td> | 18 | Room 120 | Classrooms | 10 | T 32 R F 4 (ELE) | | 112 | 1.34 | SW | 2200 | 000 | 3 226 | |
| 100 102 102 102 104 112 1104 1104 104 <th< td=""><td>18</td><td>Room 119</td><td>Classroome</td><td>12</td><td>T 32 R F 4 (FL F)</td><td></td><td>112</td><td>1 34</td><td>SW/</td><td>2400</td><td>000</td><td>3 226</td><td></td></th<> | 18 | Room 119 | Classroome | 12 | T 32 R F 4 (FL F) | | 112 | 1 34 | SW/ | 2400 | 000 | 3 226 | |
| 11 Halway 11 Of Halway 11 Of Halway 10 Internation Internatintern | 257 | Hallway | Hallways | 11 | | CF11/2 | 26 | 0.29 | SW | 2700 | SW | 652 | |
| 11 Men's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 36 11 Men's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 36 11 Women's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 36 13 Women's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 36 14 Women's Bathroom Bath Room 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 500 SW 4368 SW 41,321 73 Exterior Outside 16 120 1120/1 120 1.92 SW 4368 SW 8,387 93 Exterior Shed Outside 1 S 34 P F 2 (MAG) F42EE 72 0.07 SW 4368 SW 314 14 Exterior Shed Outside 1 | 11 | Faculty Room | Offices | 5 | S 34 P F 2 (MAG) | F42FF | 72 | 0.26 | SW | 2400 | 0.00 | 864 | |
| Image: Non-order and the order of the o | 11 | Men's Bathroom | Bath Room | 1 | S 34 P F 2 (MAG) | F42FF | 72 | 0.00 | SW | 500 | SW | 36 | |
| Normalization During of the control (integration) Control (in | 11 | Women's Bathroom | Bath Room | 1 | S 34 P F 2 (MAG) | F42FF | 72 | 0.07 | SW | 500 | SW | 36 | |
| Total Exterior Outside 16 120 110/1 120 1.92 SW 4368 SW 8,387 93 Exterior Shed Outside 5 175 175/1 75 0.38 SW 4368 SW 1,638 11 Exterior Shed Outside 1 S34 P F 2 (MAG) F42EE 72 0.07 SW 4368 SW 314 Total Total Total Total Total Total P1.42 V V V V V | 8 | Exterior | Outside | 44 | MH 175 | MH175/1 | 215 | 9.46 | SW | 4368 | SW | 41,321 | |
| 10 120 120 120 120 120 100 000 | 73 | Exterior | Outside | 16 | 1 120 | 1120/1 | 120 | 1 92 | SW | 4368 | SW | 8 387 | |
| Instruction | 93 | Exterior Shed | Outside | 5 | 175 | 175/1 | 75 | 0.38 | SW | 4368 | SW | 1 638 | |
| Total 778 91.42 91.42 227,328 | 11 | Exterior Shed | Outside | 1 | S 34 P F 2 (MAG) | F42FF | 72 | 0.07 | SW | 4368 | SW | 314 | |
| | <u> </u> | Total | | 778 | | | | 91.42 | | | | 227,328 | |

Cost of Electricity:





APPENDIX C

ECM Calculations

| | | | Summary of Er | ergy Conservation Measure | es | | |
|--------|--|-----------------------|---------------------------|----------------------------------|---------------------------|---------------------------------|-----------------------------------|
| Energy | Conservation Measure | Approx. Costs (\$) | Approx. Savings (\$/year) | Payback (Years) w/o Incentive | Potential Incentive (\$)* | Payback (Years) w/ Incentive | Recommended For Implementation |
| ECM-1 | Replace Door Seals and Sweeps | 400 | 10 | >20 | 0 | N/A | Х |
| ECM-2 | Replace Exisiting Classroom Heaters w/ Finned Radiation | 19,000 | 1,900 | 10 | 1,875 | 10 | Х |
| ECM-3 | Replace Motors with Premium Efficiency Motors | 6,000 | 700 | 9 | 300 | N/A | Х |
| ECM-4 | Night-time Setback for Air Handling Units | 1,000 | 9,900 | 0.1 | 0 | N/A | Х |
| ECM-5 | Install Fan & Dampers on Louvers | 129,000 | 1,100 | >20 | 0 | N/A | |
| ECM-6 | Install Direct Digital Control and Building Management System | 307,000 | 11,400 | 4 | 0 | N/A | |
| ECM-7 | Lighting Replacement / Upgrades | 140,000 | 11,500 | 6 | 5,320 | 6 | Х |
| ECM-8 | Lighting Controls | 9,000 | 6,300 | 1 | 1,235 | 1 | Х |
| ECM-9 | Lighting Replacements with Lighting Controls (Occupancy Sensors) | 149,000 | 15,800 | 5 | 6,560 | 5 | Х |

ECM Summary Sheet

ECM-1 **Replace Door Seals and Sweeps**

| Budgetary | Annual Utility Sa | vings | | | Estimated | Total | | | Payback | Payback |
|---------------|-------------------|----------|----------|-------|-------------|---------|------|-------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 400 | 0 | 0 | 270 | 900 | 0 | 900 | 10.1 | 0 | 0.4 | 0.4 |
| Expected Life | . 5 | vears | | | | | | | | |

Expe 0 kWh 1,350 gallons Lifetime Savings:

4,500 \$

ECM-2 Replace Exisiting Classroom Heaters w/ Finned Radiation

| Budgetary | Annual Utility Sa | vings | | | Estimated | Total | | | Payback | Payback |
|---------------|-------------------|----------|----------|-------|-------------|---------|-----|-------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 19,000 | 11,800 | 0 | 0 | 1,900 | 0 | 1,900 | 1.5 | 0 | 10.0 | 10.0 |
| Expected Life | . 25 | vears | | | | | | | | |

0 gallons

0 gallons

295,000 kWh Lifetime Savings:

\$ 47,500

ECM-3 **Replace Motors with Premium Efficiency Motors**

| Budgetary | Annual Utility Sav | vings | | | Estimated | Total | | | Payback | Payback |
|-----------|--------------------|----------|----------|-------|-------------|---------|-----|-------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 6,000 | 3,800 | 0 | 0 | 700 | 0 | 700 | 0.7 | 300 | 8.6 | 8.1 |

Expected Life: 15 years 57,000 kWh Lifetime Savings:

\$ 10,500

ECM-4 Night-time Setback for Air Handling Units

| Budgetary | Annual Utility Sa | vings | | | Estimated | Total | | | Payback | Payback |
|-----------|-------------------|----------|----------|-------|-------------|---------|-------|-------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 1,000 | 62,000 | 0 | 0 | 9,900 | 0 | 9,900 | 146.9 | 0 | 0.1 | 0.1 |

15 years Expected Life: Lifetime Savings:

930,000 kWh 0 gallons \$ 148,500

ECM-5 Install Fan & Dampers on Louvers

| Budgetary | Annual Utility Sa | vings | | | Estimated | Total | | | Payback | Payback |
|---------------|-------------------|----------|----------|-------|-------------|---------|-------|-------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 129,000 | 0 | 0 | 300 | 1,100 | 0 | 1,100 | (0.9) | 0 | >20 | >20 |
| Expected Life | . 15 | Vears | | | | | | | | |

Expe 0 kWh Lifetime Savings:

16,500 \$

Install Direct Digital Control and Building Management System ECM-6

| ľ | Budgetary | Annual Utility Sa | vings | | | Estimated | Total | | | Payback | Payback |
|---|----------------|-------------------|----------|----------|--------|-------------|---------|-------|-------------|------------|------------|
| | Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| | \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| ľ | 307,000 | 1,900 | 4 | 3,400 | 11,600 | 0 | 11,600 | (0.4) | 0 | >20 | >20 |
| | Expected Life: | 16 | years | | | | | | | | |

30,400 kWh Lifetime Savings:

\$ 185,600

54,4<u>00</u> gallons

ECM-7 Lighting Replacement / Upgrades

| Budgetary | Annual Utility Sa | vings | | | Estimated | Total | | | Payback | Payback |
|-----------|-------------------|----------|----------|--------|-------------|---------|-----|-------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 140,000 | 100,700 | 26 | 0 | 18,800 | 0 | 18,800 | 0.8 | 17,900 | 7.4 | 6.5 |
| | | | | | | | | | | |

Expected Life:15 yearsLifetime Savings:1,510,500 kWh

0 gallons

4,500 gallons

\$ 282,000

ECM-8 Install Lighting Controls (Occupancy Sensors)

| Budg | getary | Annual Utility Sa | vings | | | Estimated | Total | | | Payback | Payback |
|----------|-------------|-------------------------|------------------|----------|-------|-------------|------------|------|-------------|------------|------------|
| С | ost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| | \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 9,0 | 000 | 44,900 | 44,900 0 0 7,100 | | | | 7,100 | 11.3 | 1,400 | 1.3 | 1.1 |
| Expe | ected Life: | 15 years | | | | | | | | | |
| Lifetime | e Savings: | : 673,500 kWh 0 gallons | | | | | \$ 106,500 | _ | | | |

ECM-9 Lighting Replacements with Lighting Controls (Occupancy Sensors)

| Budgetary | Annual Utility Sa | vings | | | Estimated | Total | | | Payback | Payback |
|---------------|-------------------|----------------------------------|---------|--------|-------------|---------|-----|-------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric Electric Fuel Oil Total | | | | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 149,000 | 131,300 | 26 | 0 | 23,700 | 0 | 23,700 | 1.1 | 19,300 | 6.3 | 5.5 |
| Expected Life | . 15 | *10.0#2 | | | | | | | | |

Expected Life: 15 years Lifetime Savings: 1,969,500 kWh 0 gallons \$ 355,500

Bethlehem Township School District - NJBPU CHA Project # 24735

| Utility Costs | | | | | | | | | | | | |
|---------------|---------------|--|--|--|--|--|--|--|--|--|--|--|
| \$ 0.159 | \$/kWh blende | | | | | | | | | | | |
| \$ 0.139 | \$/kWh supply | | | | | | | | | | | |
| \$ 6.22 | \$/kW | | | | | | | | | | | |
| \$ 3.24 | \$/gals | | | | | | | | | | | |
| | \$/kgal | | | | | | | | | | | |

| | Thomas B. Comey Elementary School | | | | | | | | | | | | | | | | | | | | | | |
|-------|--|------|-----------|---------|---------|---------|-----------|------------|---------|-------|------------|----------------|-----------------|----------------|------------|---------------|-------|-----------|----------------|----------------|---------|------------|-------|
| | Item | | | Sav | ings | | | Cost | Simple | | Life | NJ Smart Start | Direct Install | Direct Install | Max | Payback w/ | | Sin | nple Projected | Lifetime Savir | ngs | | ROI |
| | | kW | kWh | gals | cooling | kgal/yr | \$ | | Payback | MTCDE | Expectancy | Incentives | Eligible (Y/N)* | Incentives** | Incentives | Incentives*** | kW | kWh | therms | cooling | kgal/yr | \$ | |
| ECM-1 | Replace Door Seals and Sweeps | 0.0 | 0 | 274 | 0 | 0 | \$ 900 | \$ 400 | 0.4 | 1.5 | 5 | \$- | Ν | \$ - | \$- | 0.4 | 0.0 | 0 | 1,368 | 0 | 0 | \$ 4,433 | 10.1 |
| ECM-2 | Replace Exisiting Classroom Heaters w/ Finned Radiation | 0.0 | 11,794 | 0 | 0 | 0 | \$ 1,900 | \$ 18,732 | 9.9 | 5.0 | 25 | \$ - | Ν | \$- | \$- | 9.9 | 0.0 | 294,850 | 0 | 0 | 0 | \$ 46,881 | 1.5 |
| ECM-3 | Replace Motors with Premium Efficiency Motors | 1.1 | 3,841 | 0 | 0 | 0 | \$ 700 | \$ 5,596 | 8.0 | 1.6 | 15 | \$ 300 | Ν | \$- | \$ 300 | 7.6 | 16.5 | 57,618 | 0 | 0 | 0 | \$ 9,240 | 0.7 |
| ECM-4 | Night-time Setback for Air Handling Units | 0.0 | 61,984 | 0 | 0 | 0 | \$ 9,900 | \$ 1,000 | 0.1 | 26.0 | 15.0 | \$- | Ν | \$ - | \$- | 0.1 | 0.0 | 929,760 | 0 | 0 | 0 | \$ 147,832 | 146.9 |
| ECM-5 | Install Fan & Dampers on Louvers | 0.0 | 0 | 338 | 0 | 0 | \$ 1,100 | \$ 129,360 | 117.6 | 1.8 | 15.0 | \$- | Ν | \$ - | \$- | 117.6 | 0.0 | 0 | 5,070 | 0 | 0 | \$ 16,427 | (0.9) |
| ECM-6 | Install Direct Digital Control and Building Management System | 3.7 | 1,865 | 3,401 | 0 | 0 | \$ 11,600 | \$ 306,900 | 26.5 | 18.9 | 16.0 | \$- | N | \$- | \$- | 26.5 | 59.7 | 29,840 | 54,413 | 0 | 0 | \$ 184,900 | (0.4) |
| ECM-7 | Lighting Replacement / Upgrades | 37.5 | 100,690 | 0 | 0 | 0 | \$ 18,800 | \$ 140,358 | 7.5 | 42.3 | 15.0 | \$ 17,910 | Ν | \$- | \$ 17,910 | 6.5 | 562.5 | 1,510,350 | 0 | 0 | 0 | \$ 251,924 | 0.8 |
| ECM-8 | Install Lighting Controls (Occupancy Sensors) | 0.0 | 44,855 | 0 | 0 | 0 | \$ 7,100 | \$ 8,708 | 1.2 | 18.8 | 15.0 | \$ 1,375 | Ν | \$ - | \$ 1,375 | 1.0 | 0.0 | 672,825 | 0 | 0 | 0 | \$ 106,979 | 11.3 |
| ECM-9 | Lighting Replacements with Lighting Controls (Occupancy Sensors) | 37.5 | 131,295 | 0 | 0 | 0 | \$ 23,700 | \$ 149,066 | 6.3 | 55.2 | 15.0 | \$ 19,285 | Ν | \$- | \$ 19,285 | 5.5 | 562.5 | 1,969,425 | 0 | 0 | 0 | \$ 315,735 | 1.1 |
| | Total (Does Not Include ECM-7 & ECM-8) | 42.3 | 210,779.2 | 4,012.4 | 0.0 | 0.0 | 49,800.0 | 611,053.7 | 12.3 | | 15.1 | \$ 19,585 | | \$ - | \$ 19,585 | 11.9 | 638.7 | 3,281,493 | 60,851 | 0 | 0 | \$725,448 | 0.2 |
| | Total Measures with Payback <15 | 38.6 | 208,914.2 | 273.6 | 0.0 | 0.0 | 37,100.0 | 174,793.7 | 4.7 | | 15.0 | \$ 19,585 | | \$ 5 | \$ 19,585 | 4.2 | 579.0 | 3,251,653 | 1,368 | 0 | 0 | #REF! | #REF! |
| | % of Existing | 21% | 33% | 24% | 0% | #DIV/0! | | | | | | | | | | | | | | | | | |

Thomas B. Conley Elementary School

| | Yearly Usage | MTCDE | Building Area | Annual Uti | lity Cost | |
|-------|--------------|------------|----------------|----------------|----------------|-----|
| ended | | 0.00042021 | 59,584 | Electric | Fuel Oil | |
| pply | 631,931 | 0.00042021 | | \$100,452.49 | \$ 55,042.00 | |
| | 202.9 | 0 | | | | |
| | 17,004 | 0.00533471 | | | | |
| | | 0 | | | | |
| | | - | | | | |
| | | | | | | |
| le | | Life | NJ Smart Start | Direct Install | Direct Install | Max |
| | | | | | | |

Bethlehem Township School District - NJBPU CHA Project # 24735

Thomas Conley Elementary School

ECM-1: Replace Door Seals

Existing: Lack of door seals result in excessive heat loss and infiltration Proposed: Install door seals and/or weather-stripping to reduce air infiltration

Heating System Efficiency Cooling System Efficiency Linear Feet of Door Edge Existing Infiltration Factor* Proposed Infiltration Factor* 80% 1.20 kW/ton 160 1.5 cfm/LF 0.45 cfm/LF

Ex Occupied Clng Temp. Ex Unoccupied Clng Temp. Cooling Occ Enthalpy Setpoint Cooling Unocc Enthalpy Setpoint

<mark>72</mark> *F 80 *F Ex Unoccupied Htg Temp. 27.5 Btu/lb Electricity Fuel Oil 27.5 Btu/lb

Ex Occupied Htg Temp. \$

<mark>72</mark> *F 65 *F 0.16 \$/kWh 3.24 \$/gallon

*Infiltration Factor per Carrier Handbook of Air Conditioning System Design based on average door seal gap calculated below.

| | | | | | EXISTIN | <u>G LOADS</u> | PROPOS | ED LOADS | HEATING EN | ERGY |
|----------------------------------|-----------------------------------|--|--|-----------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|--|
| | | | | | Occupied | Jnoccupie | Occupied | Unoccupied | | |
| Avg Outdoor Air Temp. Bins °F | Avg Outdoor Air Enthalpy | Existing Equipme nt Bin Hours | Occupied Equipme nt Bin Hours | Unoccupied Equipment Bin Hours | Door Infiltratio n Load BTUH | Door Infiltratio n Load BTUH | Door Infiltratio n Load BTUH | Door Infiltration Load BTUH | Existing Heating Energy gallons | Proposed Heating Energy gallons |
| A | | В | C | D | E | F | G | н | ĸ | L |
| 102.5 | 0.0 | 0 | 0 | 0 | 29,700 | 29,700 | 8,910 | 8,910 | 0 | 0 |
| 97.5 | 0.0 | 6 | 2 | 4 | 29,700 | 29,700 | 8,910 | 8,910 | 2 | 0 |
| 92.5 | 49.1 | 45 | 16 | 29 | -23,328 | -23,328 | -6,998 | -6,998 | 0 | 0 |
| 87.5 | 42.5 | 146 | 52 | 94 | -16,200 | -16,200 | -4,860 | -4,860 | 0 | 0 |
| 82.5 | 39.5 | 298 | 106 | 192 | -12,960 | -12,960 | -3,888 | -3,888 | 0 | 0 |
| 77.5 | 36.6 | 476 | 170 | 306 | -9,828 | 0 | -2,948 | 0 | 0 | 0 |
| 72.5 | 34.0 | 662 | 237 | 426 | -7,020 | 0 | -2,106 | 0 | 0 | 0 |
| 67.5 | 31.6 | 740 | 264 | 476 | 1,166 | 0 | 350 | 0 | 3 | 1 |
| 62.5 | 29.2 | 765 | 273 | 492 | 2,462 | 648 | 739 | 194 | 9 | 3 |
| 57.5 | 27.0 | 733 | 262 | 471 | 3,758 | 1,944 | 1,128 | 583 | 17 | 5 |
| 52.5 | 24.5 | 668 | 239 | 430 | 5,054 | 3,240 | 1,516 | 972 | 23 | 7 |
| 47.5 | 21.4 | 659 | 235 | 424 | 6,350 | 4,536 | 1,905 | 1,361 | 31 | 9 |
| 42.5 | 18.7 | 685 | 245 | 441 | 7,646 | 5,832 | 2,294 | 1,750 | 40 | 12 |
| 37.5 | 16.2 | 739 | 264 | 475 | 8,942 | 7,128 | 2,683 | 2,138 | 52 | 16 |
| 32.5 | 14.4 | 717 | 256 | 461 | 10,238 | 8,424 | 3,072 | 2,527 | 59 | 18 |
| 27.5 | 12.6 | 543 | 194 | 349 | 11,534 | 9,720 | 3,460 | 2,916 | 51 | 15 |
| 22.5 | 10.7 | 318 | 114 | 205 | 12,830 | 11,016 | 3,849 | 3,305 | 33 | 10 |
| 17.5 | 8.6 | 245 | 88 | 158 | 14,126 | 12,312 | 4,238 | 3,694 | 29 | 9 |
| 12.5 | 6.8 | 156 | 56 | 100 | 15,422 | 13,608 | 4,627 | 4,082 | 20 | 6 |
| 7.5 | 5.5 | 92 | 33 | 59 | 16,718 | 14,904 | 5,016 | 4,471 | 13 | 4 |
| 2.5 | 4.1 | 36 | 13 | 23 | 18,014 | 16,200 | 5,404 | 4,860 | 5 | 2 |
| -2.5 | 2.6 | 19 | 7 | 12 | 19,310 | 17,496 | 5,793 | 5,249 | 3 | 1 |
| -7.5 | 1.0 | 8 | 3 | 5 | 20,606 | 18,792 | 6,182 | 5,638 | 1 | 0 |
| TOTALS | | 8,760 | 3,129 | 5,631 | | | | | 390.921 | 117.276 |

| Existing Door Infiltration | 240 | cfm | Fuel Oil Savings: | 273.645 | gallons |
|---------------------------------------|-----|-----|-------------------|--------------|---------|
| Existing Unoccupied Door Infiltration | 240 | cfm | Cost savings: | \$ 886.61 | |
| Proposed Door Infiltration | 72 | cfm | | | |
| Proposed Unoccupied Door Infiltration | 72 | cfm | | | |

| Door | Width (ft) | Height (ft) | Linear Feet (LF) | gap (in) | gap location | LF of gap | % door w/ gap | Average gap for door (in) |
|-------|---------------|----------------|---------------------|----------|-----------------|-----------|------------------|---------------------------------|
| 1a | 3 | 7 | 20 | 0.25 | all sides | 20 | 100% | 0.25 |
| 1b | 3 | 7 | 20 | 0.25 | all sides | 20 | 100% | 0.25 |
| 2a | 3 | 7 | 20 | 0.25 | all sides | 20 | 100% | 0.25 |
| 2b | 3 | 7 | 20 | 0.25 | all sides | 20 | 100% | 0.25 |
| 3a | 3 | 7 | 20 | 0.125 | all sides | 20 | 100% | 0.125 |
| 3b | 3 | 7 | 20 | 0.125 | all sides | 20 | 100% | 0.125 |
| 4a | 3 | 7 | 20 | 0.125 | all sides | 20 | 100% | 0.125 |
| 4b | 3 | 7 | 20 | 0.0625 | all sides | 20 | 100% | 0.0625 |
| Total | 24 | 56 | 160 | 0.191 | | 160 | 100% | 0.180 |

Note: Doors labeled 'a', 'b', etc. are a part of the same door assembly.

| Multipliers | |
|-------------|------|
| Material: | 1.10 |
| Labor: | 1.35 |
| Equipment: | 1.10 |

ECM-1: Replace Door Seals

| Description | | | | | | UNIT COSTS | 6 | | SUB | тот | FAL CO | STS | | DEMARKS |
|-------------|-----|------|--------|-------|--------|------------|------|----|-----|--------|------------|---------|--|---------|
| Description | QII | UNIT | MAT. | LABOR | EQUIP. | Ν | MAT. | LA | BOR | EQUIP. | TOTAL COST | REMARKS | | |
| Door Seals | 1 | EA | \$ 276 | | | \$ | 303 | \$ | - | \$- | \$ 303 | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$- | | | |
| | | | | | | \$ | - | \$ | - | \$- | \$ - | | | |

| \$ 303 | Subtotal |
|-------------|--------------------|
| \$ 30.31 | 10% Contingency |
| \$ 66.67 | 20% Contractor O&P |
| \$ - | |
| \$ 400 | Total |

Bethlehem Township School District - NJBPU CHA Project # 24735 Thomas B. Conley Elementary School 1978 Original Building

ECM-2 Replace Existing Classroom Cabinet Heaters with Finned Radiation

| EXISTING CONDITIONS | | | | | | | | | |
|------------------------------------|----|-----------|--------|--|--|--|--|--|--|
| No. of existing CH-1 Classroom Cat | | 72 | | | | | | | |
| Watts per CH-1 Cabinet Heater | | 60 | watts | | | | | | |
| Hours used per year | | 2,730 | hrs | | | | | | |
| Electricity consumed one year | | 11,794 | | | | | | | |
| | | | | | | | | | |
| Annual Cost of Electricity | \$ | 0.16 | \$/kWh | | | | | | |
| | | | | | | | | | |
| Total Annual Cost | \$ | 1,875.18 | | | | | | | |
| | | | | | | | | | |
| REPLACEMENT COSTS | | | | | | | | | |
| Remove Existing Cabinet Heaters | \$ | 3,400.00 | | | | | | | |
| Install New Finned Tube Radiation | \$ | 15,300.00 | | | | | | | |
| | | | | | | | | | |
| Total Estimated Project Cost | \$ | 18,700.00 | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| SAVINGS | | | | | | | | | |
| Annual Electricity Savings | | 11,794 | kWh | | | | | | |
| Annual Electricity Cost Savings | \$ | 1,875.18 | | | | | | | |
| | | | | | | | | | |
| Estimated Total Project Cost | \$ | 18,700 | | | | | | | |
| Simple Payback | | 10.0 | years | | | | | | |

Assumptions

- 1 17 No. of existing classrooms with cabinet heaters
- 2 \$200 Cost of demolition existing cabinet heaters per classroom
- 3 \$900.00 New Finned Tube Radiation per classroom, including piping, control valve, finish work

| Multipliers | |
|-------------|------|
| Material: | 1.10 |
| Labor: | 1.35 |
| Equipment: | 1.10 |

ECM-2: Replace Existing Classroom Cabinet Heaters with Finned Radiation

| Description | | | | UNIT COSTS | 6 | SUE | BTOTAL CC | STS | TOTAL COST | DEMARKS |
|--|-----|----|----------|------------|--------|-----------|-----------|--------|------------|---------|
| Description | QII | | MAT. | LABOR | EQUIP. | MAT. | LABOR | EQUIP. | TOTAL COST | |
| Demolition on Old Cabinet Heaters | 17 | EA | \$- | \$ 105 | \$- | \$- | \$ 2,410 | \$- | \$ 2,410 | |
| New Finned Tube Radiation - piping, control valve, finish work | 17 | | \$ 630.0 | \$- | \$- | \$ 11,781 | \$- | \$- | \$ 11,781 | |
| | | | | | | \$- | \$- | \$- | \$- | |
| | | | | | | \$- | \$- | \$- | \$- | |
| | | | | | | \$- | \$- | \$- | \$- | |
| | | | | | | \$- | \$- | \$- | \$- | |
| | | | | | | \$- | \$- | \$- | \$- | |
| | | | | | | \$- | \$- | \$- | \$- | |
| | | | | | | \$- | \$- | \$- | \$- | |
| | | | | | | \$- | \$- | \$- | \$ - | |
| | | | | | | \$- | \$ - | \$- | \$- | |

| \$ 14,191 | Subtotal |
|----------------|--------------------|
| \$ 1,419.08 | 10% Contingency |
| \$ 3,121.97 | 20% Contractor O&P |
| \$ - | |
| \$ 18,732 | Total |

ECM-3: Install Premium Efficiency Motors

| Runtime Schedule: | 3,650 hrs/Annual |
|----------------------|------------------|
| Days Open Per Week: | 7 days |
| Supply Electric Rate | \$ 0.159 /kWh |
| Demand Rate | \$ 6.22 /kW |

EXISTING CONDITIONS

| Area Description | Description | HP | Load Factor | Efficiency | kW | Avg. Daily | Annual Hours | Annual kWh | An | inual Energy Cost |
|---------------------|-------------|------|-------------|------------|-----|---------------|-----------------|------------|----|----------------------|
| 1978 Boiler Rm | CP-1, 2 | 5.0 | 0.8 | 81.3% | 3.7 | 10 | 3,650.0 | 13,391.4 | \$ | 2,129.23 |
| 2002 Boiler Rm | P-1, 2 | 7.5 | 0.8 | 85.5% | 5.2 | 10 | 3,650.0 | 19,100.4 | \$ | 3,036.96 |
| | | | | | 0 | 10 | 3,650.0 | 0.0 | \$ | - |
| | | | | | 0 | 10 | 3,650.0 | 0.0 | \$ | - |
| | | | | 0.0% | 0 | 10 | 3,650.0 | 0.0 | \$ | - |
| TOTALS: | | 12.5 | | | 8.9 | | | 32,491.8 | \$ | 5,166.20 |

RETROFIT CONDITIONS

| Area Description | Description | HP | Load Factor | Efficiency | kW | Avg. Daily | Annual Hours | Annual kWh | Annual Co | Energy ost |
|---------------------|-------------|------|-------------|------------|-----|---------------|-----------------|------------|--------------|---------------|
| 1978 Boiler Rm | CP-1, 2 | 5.0 | 0.8 | 89.7% | 3.3 | 10 | 3,650.0 | 12,137.4 | \$ 1 | 1,929.84 |
| 2002 Boiler Rm | P-1, 2 | 7.5 | 0.8 | 90.8% | 4.9 | 10 | 3,650.0 | 17,985.5 | \$ 2 | 2,859.69 |
| TOTALS: | | 12.5 | | | 8.3 | | | 30,122.9 | \$ 2 | 4,789.54 |

COST ANALYSIS

| Area Description | kW Saved | Annual kWh Saved | Annual \$ Saved | Retrofit Cost (\$ EA) | Simple Payback (yrs.) |
|---------------------|----------|------------------------|--------------------|--------------------------|-----------------------------|
| 1978 Boiler Rm | 0.3 | 1,254.0 | \$ 225.04 | \$ 2,798.00 | 12.43 |
| 2002 Boiler Rm | 0.3 | 1,114.9 | \$ 200.07 | \$ 2,798.00 | 13.99 |
| TOTALS: | 0.6 | 2,368.9 | \$ 425.10 | \$ 5,596.00 | 13.16 |

Notes:

Budgetary cost and energy saving estimates are based on rule of thumb type calculations, RS Means estimating guides, these are not investment grade level estimates, and provide order of magnitude type cost and saving estimates only.

Retrofit Cost equals the cost for four motor retrofits; although motors operate on a lead-lag basis and only one in each pair operates at a time.

| Multipliers | |
|-------------|------|
| Material: | 1.10 |
| Labor: | 1.35 |
| Equipment: | 1.10 |

ECM-3: Install Premium Efficiency Motors

| Description | ΟΤΥ | | | UNIT COSTS | S | | SUE | STOTAL (| COST | S | TOTAL COST | DEMARKS |
|---------------------------------|-----|------|----------|------------|--------|----|------|----------|-------|-------|-------------|---------|
| Description | QII | UNIT | MAT. | LABOR | EQUIP. | Ν | ЛАТ. | LABOF | 2 E | QUIP. | TOTAL COST | REMARKS |
| 5 HP Premium Efficiency Motor | 1 | EA | \$ 595 | \$ 273 | \$- | \$ | 655 | \$ 36 | 8 \$ | - | \$ 2,045.02 | |
| 7.5 HP Premium Efficiency Motor | 1 | EA | \$ 660.0 | \$ 275.00 | \$- | \$ | 726 | \$ 37 | 1 \$ | - | \$ 2,194.50 | |
| | | | | | | \$ | - | \$ | - \$ | - | \$- | |
| | | | | | | \$ | - | \$ | - \$ | - | \$- | |
| | | | | | | \$ | - | \$ | - \$ | - | \$- | |
| | | | | | | \$ | - | \$ | - \$ | - | \$- | |
| | | | | | | \$ | - | \$ | - \$ | - | \$- | |
| | | | | | | \$ | - | \$ | - \$ | - | \$- | |
| | | | | | | \$ | - | \$ | - \$ | - | \$- | |
| | | | | | | \$ | - | \$ | - \$ | - | \$ - | |
| | | | | | | \$ | - | \$ | - \$ | - | \$- | |

| \$ 4,240 | Subtotal |
|--------------|--------------------|
| \$ 423.95 | 10% Contingency |
| \$ 932.69 | 20% Contractor O&P |
| \$ - | |
| \$ 5,596 | Total |

Bethlehem Township School District - NJBPU CHA Project # 24735 Thomas B. Conley Elementary School 1978 Original Building

ECM-4 Add Night-time Setback to Air Handling Units

| Energy | De | mand |
|---------|----|------|
| Cost | F | Rate |
| \$/kWh | \$ | /kW |
| \$ 0.16 | \$ | 6.22 |

| | | EXISTING | CONDITIO | NS | | | | | PROPO | SED | CONDITI | ONS | |
|---------------|------|-------------|---------------------|--------|--------------|-----------|------------|---------------------------|-----------------------|-----|---------|-----|--------|
| AHU-1 | HP | Load factor | Ex. Effic. | Ex. kW | Annual Hours | Total kWh | Ex. Cost | Annual Hours | Total kWh | Pro | p. Cost | S | avings |
| Supply Fan-1 | 0.75 | 80% | 83.10% | 0.50 | 6935 | 3458 | \$ 549.7 | 9 2500 | 1247 | \$ | 198 | \$ | 352 |
| Exhaust Fan-1 | 3 | 80% | <mark>83.10%</mark> | 1.99 | 6935 | 13831 | \$ 2,199.1 | 6 2500 | 4986 | \$ | 793 | \$ | 1,406 |
| ERW-1 | 0.25 | 80% | <mark>84%</mark> | 0.17 | 6935 | 1165 | \$ 185.2 | 5 2500 | 420 | \$ | 67 | \$ | 118 |
| AHU-2 | | | | | | | | | | | | | |
| Supply Fan-2 | 5 | 80% | 83.10% | 3.32 | 6935 | 23052 | \$ 3.665.2 | 6 2500 | 8310 | \$ | 1.321 | \$ | 2.344 |
| Exhaust Fan-2 | 5 | 80% | 83.10% | 3.32 | 6935 | 23052 | \$ 3,665.2 | 6 2500 | 8310 | \$ | 1,321 | \$ | 2,344 |
| ERW-2 | 0.25 | 80% | <mark>84%</mark> | 0.17 | 6935 | 1165 | \$ 185.2 | 5 2500 | 420 | \$ | 67 | \$ | 118 |
| AHU-3 | | | | | | | | | | | | | |
| Supply Fan-3 | 1.5 | 80% | 83.10% | 1.00 | 6935 | 6916 | \$ 1,099.5 | 8 2500 | 2493 | \$ | 396 | \$ | 703 |
| Exhaust Fan-3 | 5 | 80% | <mark>83.10%</mark> | 3.32 | 6935 | 23052 | \$ 3,665.2 | 6 2500 | 8310 | \$ | 1,321 | \$ | 2,344 |
| ERW-3 | 0.25 | 80% | <mark>89%</mark> | 0.18 | 6935 | 1234 | \$ 196.2 | 7 2500 | 445 | \$ | 71 | \$ | 126 |
| Totals: | | | | 14.0 | | 96,925 | \$15,411 | | 34941 | \$ | 5,556 | \$ | 9,856 |
| | | | | | | | | kWh saved: \$\$ saved: | 61,984 \$ 9,856 | | | | |
| | | | | | | | | | , | | | | |

Assumptions

6935 Annual no. of hours for AHU units on for the entire school year 2500 Annual no. of hours for AHU units on during occupied hours

\$ 1,000 Cost of implementing the change to the existing controls system

| Multipliers | |
|-------------|------|
| Material: | 1.10 |
| Labor: | 1.35 |
| Equipment: | 1.10 |

ECM-4: Add Night-time Setback to Air Handling Units

| Description | ΟΤΥ | | | UNIT COST | S | SUE | BTOTAL CC | STS | TOTAL COST | DEMARKS |
|--|-----|----|------|-----------|--------|------|-----------|--------|------------|---------|
| Description | | | MAT. | LABOR | EQUIP. | MAT. | LABOR | EQUIP. | | |
| Cost of Implementing Setback to DDC System | | EA | \$- | \$ 281 | \$- | \$- | \$ 379 | \$- | \$ 757.35 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| E | , \$ | 1,000 | Total |
|---|--------------------|--------|--------------------|
| | \$ | - | |
| | \$ | 166.62 | 20% Contractor O&P |
| | \$ | 75.74 | 10% Contingency |
| | \$ | 757 | Subtotal |

Bethlehem Township School District - NJBPU CHA Project # 24735

Thomas B. Conley School

ECM-5 Add Dampers, Fan, and Ductwork in Attic Space

3.24 Price of fuel oil \$/gallon

\$

| | Heat L | oss Thr | ough the (| Ceiling (| Current | | | | Heat Lo | ss Through | the Ceil | ing P | rop | osed | |
|---------|------------|---------|------------|-----------|-------------|------------|----------|----------------|-----------|-------------|------------|----------|-----|-----------|--|
| Heating | Number of | delta | square | Current | Heat | Boiler | Gallons | Cost of | Proposed | Heat | Boiler | Gallons | | Cost of | |
| Degree | hours from | т | foot | effective | loss | efficiency | of fuel | fuel oil | effective | loss | efficiency | of fuel | | fuel oil | |
| Range | Bin data | | area | U-value | BTUHs | | oil used | | U-value | BTUHs | | oil used | | | |
| 50 - 55 | 695 | 2.5 | 58,084 | 0.05 | 5,046,048 | 78% | 46.7 | \$ 151.34 | 0.04 | 4,205,040 | 78% | 38.9 | \$ | 126.12 | |
| 45 - 50 | 656 | 7.5 | 58,084 | 0.05 | 14,288,664 | 78% | 132.3 | \$ 428.54 | 0.04 | 11,907,220 | 78% | 110.2 | \$ | 357.12 | |
| 40 - 45 | 629 | 17.5 | 58,084 | 0.05 | 31,967,982 | 78% | 295.9 | \$ 958.77 | 0.04 | 26,639,985 | 78% | 246.6 | \$ | 798.98 | |
| 35 - 40 | 909 | 17.5 | 58,084 | 0.05 | 46,198,562 | 78% | 427.6 | \$ 1,385.57 | 0.04 | 38,498,801 | 78% | 356.4 | \$ | 1,154.64 | |
| 30 - 35 | 788 | 22.5 | 58,084 | 0.05 | 51,491,466 | 78% | 476.6 | \$ 1,544.32 | 0.04 | 42,909,555 | 78% | 397.2 | \$ | 1,286.93 | |
| 25 - 30 | 322 | 27.5 | 58,084 | 0.05 | 25,716,691 | 78% | 238.1 | \$ 771.29 | 0.04 | 21,430,576 | 78% | 198.4 | \$ | 642.74 | |
| 20 - 25 | 223 | 32.5 | 58,084 | 0.05 | 21,048,190 | 78% | 194.8 | \$ 631.27 | 0.04 | 17,540,158 | 78% | 162.4 | \$ | 526.06 | |
| 15 - 20 | 122 | 37.5 | 58,084 | 0.05 | 13,286,715 | 78% | 123.0 | \$ 398.49 | 0.04 | 11,072,263 | 78% | 102.5 | \$ | 332.08 | |
| 10 - 15 | 50 | 42.5 | 58,084 | 0.05 | 6,171,425 | 78% | 57.1 | \$ 185.09 | 0.04 | 5,142,854 | 78% | 47.6 | \$ | 154.24 | |
| 5 - 10 | 18 | 47.5 | 58,084 | 0.05 | 2,483,091 | 78% | 23.0 | \$ 74.47 | 0.04 | 2,069,243 | 78% | 19.2 | \$ | 62.06 | |
| 0 - 5 | 7 | 52.5 | 58,084 | 0.05 | 1,067,294 | 78% | 9.9 | \$ 32.01 | 0.04 | 889,411 | 78% | 8.2 | \$ | 26.67 | |
| | | | | | | | | | | | | | | | |
| | | | | | 218,766,126 | | 2,025 | \$ 6,561.16 | | 182,305,105 | | 1,688 | \$ | 5,467.63 | |
| | | | | | BTUs | | gallons | fuel cost | | BTUs | | gallons | | fuel cost | |

| Existing fuel oil cost | \$ 6,561.16 | per year |
|-----------------------------------|------------------------|-------------------------------------|
| Proposed fuel oil cost | \$ 5,467.63 | per year |
| Fuel Savings Fuel Cost Savings | \$ 338 1,093.53 | gallons per year |
| Installation Costs Payback | \$ 10,000.00 9.1 | includes materials, and labor years |

Assumptions:

| 1 | | Asbury, NJ latitude very close to NYC latitude so use NYC Bin weather data |
|---|---------|---|
| 2 | 20 | Effective current R value of ceiling + insulation. Original fiberglass insulation thickness was 12", however settling |
| | | since 1978, and due to wind / pressure infiltration effects, effective insulation R value is diminished |
| 3 | 58,084 | Area of building, minus areas of 2nd flr mech. Rooms, = approximately 58,084 sq.ft. |
| 4 | 138,500 | The number of Btus in a gallon of #2 fuel oil |
| 5 | | Building is in heating mode at 55 degrees and lower |
| 6 | 24 | Effective ceiling R value after installing dampers and assoc. HVAC ductwork |
| 7 | | The above calculates total fuel consumed for heat loss through the ceiling only |

| Multipliers | |
|-------------|------|
| Material: | 1.10 |
| Labor: | 1.35 |
| Equipment: | 1.10 |

ECM-5: Add Dampers, Fan, and Ductwork in Attic Space

| Description | ΟΤΥ | | | UNIT COSTS | 6 | SUE | BTOTAL CO | STS | TOTAL COST | DEMARKS |
|--|-----|------|-----------|------------|--------|-----------|-----------|--------|--------------|---------|
| Description | | UNIT | MAT. | LABOR | EQUIP. | MAT. | LABOR | EQUIP. | TOTAL COST | |
| Dampers, Fan and Ductwork in Attic Space | 1 | EA | \$ 20,000 | \$ 20,000 | | \$ 22,000 | \$ 27,000 | \$- | \$ 98,000.00 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| \$ 129,360 | Total |
|-----------------|--------------------|
| \$ - | |
| \$ 21,560.00 | 20% Contractor O&P |
| \$ 9,800.00 | 10% Contingency |
| \$ 98,000 | Subtotal |

ECM 6 - Replace Pneumatic Controls with DDC Controls

| EXISTING CONDITIONS | | | ן |
|--|-----------|----------------------|-----------------------|
| Electricity Consumed by Air Compressor | 1,865 | kWh | 3.73kW * 500 hours |
| Fuel Oil Consumed by HVAC System | 17,004 | gallons ¹ | From Utility Analysis |
| | | | |
| | | | |
| SAVINGS | | - | _ |
| Electric Savings | 1,865 | kWh ² | |
| Electric Demand Savings | 4 | kW ² | |
| Fuel Oil Savings | 3,401 | gallons ³ | |
| Total Cost Savings | \$ 11,400 | | |
| Estimated Total Project Cost | \$ 50,000 | 4,5 | |
| Simple Payback | 4.4 | years | |

Assumptions

- 1 Fuel Oil consumption based on utility data, boiler capacity & operating hours
- 2 Electric savings from removing the air compressor
- 3 20% Approximate oil savings from night setback & temperature scheduling
- Project cost is an estimate, includes cost of replacing non- programmable thermostats with programmable thermostats
 control work cost

| Multipliers | | |
|-------------|------------|------|
| | Material: | 1.10 |
| | Labor: | 1.35 |
| | Equipment: | 1.10 |

ECM-6: Replace Pneumatic Controls with DDC Controls

| Description | ΟΤΥ | | l | JNIT COSTS | | SU | BTOTAL COS | TS | TOTAL COST | DEMARKS |
|--|-----|------|-----------|------------|--------|----------|--------------|--------|--------------|---------|
| Description | QTT | UNIT | MAT. | LABOR | EQUIP. | MAT. | LABOR | EQUIP. | TOTAL COST | REMARKS |
| Replace Pnuematic Controls with DDC Controls | 1 | LS | \$150,000 | \$ 50,000 | | \$ 165,0 | 00 \$ 67,500 | \$- | \$232,500.00 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| \$ - |
|------|

Geothermal / Heat Pump Calc

Electricity Blended Rate: Fuel oil price: 0.159 \$/kWh 3.24 \$ per gallon

Description: What would be the payback period to install a geothermal/heat pump heating and cooling system for the entire school? Currently only the 2002 addition is air conditioned. Heat pumps would take over both heating and cooling for almost all of the entire facility.

Assumptions / Givens:

| 1 | 37 | Total number of heat pumps |
|----|-----------------|---|
| 2 | 22 | Number of heat pumps required for 1978 portion |
| 3 | 15 | Number of heat pumps required for 2002 addition |
| 4 | 26.000 | |
| 4 | 36,000 | BTUH cooling each heat pump [McQuay 2-stage geothermal heat pump] |
| 5 | 26,600 | BTUH heating each heat pump [McQuay 2-stage geothermal heat pump] |
| 6 | 22.0 | EER of each heat pump |
| 7 | 4.3 | COP of each heat pump |
| 8 | 11.0 | avg. EER of existing Carrier HJ model air conditioning RTUs for the 2002 addition |
| 9 | 631,931 | Total kWh electricity consumed in 2011-2012 school year |
| 10 | 317,525 | Total estimated kWh electricity consumed just for cooling in 2011-2012 school year |
| 11 | 17,004 | Total # gallons of fuel oil consumed in 2011-2012 school year |
| 12 | 140,000 | #BTUs per gallon of fuel oil |
| 13 | 80% | Efficiency of boilers |
| 14 | 2,975,700,000 | #BTUs required to heat the school for 2011-2012 school year |
| 15 | 2,975,700,000 | #BTUs required for heating using heat pumps will not change from 2011-2012 school year |
| 16 | BTU/watts | = EER |
| 17 | BTU/(3413*kW) | = COP |
| 18 | \$ 1,200,000.00 | = total installed cost of geothermal/heat pump system including bore field, pumps, piping, heat pumps, DDC controls, etc. |

Existing Case: Annual cost for COOLING and HEATING (2011-2012 school year):

| Total annual cost for cooling: | \$ 50,486.48 | kWh x blended rate |
|--|------------------|-------------------------------------|
| Total annual cost for heating: | \$ 55,092.96 | gallons fuel oil x price per gallon |
| | | |
| Total existing cost for cooling and heating: | \$ 105,579.44 | Sum |
| | | |
| | | |

Proposed Case: COOLING using heat pumps:

| Total amount of electricity required to cool the 2002 addition using heat put | mps: |
|---|------|
| Total amount of electricity required to cool the entire school using heat pur | nps: |

| 158,762.5 | kWh |
|-----------|-----|
| 391,614.2 | kWh |

62,266.65

\$

kWh x the EER ratio kWh of 2002 addition x additional units for 1978 bldg.

Total cost of electricity required to cool the entire school using heat pumps:

kWh x blended rate



Geothermal Heat Pump System

| Budgetary | Annual Utility Savings | | | | Estimated | Total | | | Payback | Payback |
|-------------------|------------------------|----------|----------|---------|-------------|---------|-------|-------------|------------|------------|
| Cost | | | | | Maintenance | Savings | ROI | Incentive * | (without | (with |
| | Electric | Electric | Fuel Oil | Total | Savings | | | | incentive) | incentive) |
| \$ | kWh | kW | Gallons | \$ | \$ | \$ | | \$ | Years | Years |
| 1,200,000 | -277,000 | 0 | 17,000 | 11,000 | 0 | 11,000 | (6.8) | 83,250 | >20 | >20 |
| Expected Life: | 25 | years | | | | | | | | |
| Lifetime Savings: | -6,925,000 | kWh | 425,000 | gallons | \$ 275,000 | | | | | |

Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735

ECM-7 Lighting Replacements

| Budgetary | Annual Utility Savings | | | | Estimated | Total | New Jersey | Payback | Payback |
|-----------|------------------------|---------|--------|----------|-------------|----------|------------|---------------------|------------------|
| Cost | | | | | Maintenance | Savings | Incentive | (without incentive) | (with incentive) |
| | | | | | Savings | U | | , | , |
| \$ | kW | kWh | therms | \$ | \$ | \$ | \$ | Years | Years |
| \$140,358 | 37.5 | 100,690 | 0 | \$18,808 | 0 | \$18,808 | \$17,910 | 7.5 | 6.5 |

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-8 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 |
| \$8,708 | 0.0 | 44,855 | 0 | \$7,132 | 0 | \$7,132 | \$1,375 | 1.2 | 1.0 |

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-9 Lighting Replacements with Occupancy Sensors

| Budgetary | | Annual Uti | lity Savings | | Estimated | Total | New Jersey | Payback | Payback |
|-----------|------|------------|--------------|----------|-------------|----------|------------|------------|------------|
| | | | | | | | | (without | (with |
| Cost | | | | | Maintenance | Savings | Incentive | incentive) | incentive) |
| | | | | | Savings | | | | |
| \$ | kW | kWh | therms | \$ | \$ | \$ | \$ | Years | Years |
| \$149,066 | 37.5 | 131,295 | 0 | \$23,674 | 0 | \$23,674 | \$19,285 | 6.3 | 5.5 |

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735 ECM-7 Lighting Replacements

| | | EXISTING CONDITIONS | | | | | | | | | | RETROFIT (| CONDITION | S | | | | | COS | ST & SAVIN | GS ANALYS | SIS | | |
|----------------|---|---|---|---|---|------------------------------|--------------------------------|---|--------------------------------|---------------------------------------|---|--|---|---|-------------------------------|---|--------------------------------|---|---|--|---|--|--|---|
| | 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 Standa Fixture Wattages | ard 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 |
| 11 11 | Doorway - 3 Old Hallway | 44 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE | 72 | 0.1 | SW SW | 2280 2280 | | 1 44 | S 28 P F 2 S 28 P F 2 | F42SSILL F42SSILL | 48 48 | 0.0 | SW SW | 2,280 2,280 | <u> </u> | 55 2,408 | 0.0 | \$ 10.49 \$ 461.64 | \$ 114.75 \$ 5,049.00 | \$10 \$440 | 10.9 10.9 | <u>1.9</u> 1.9 |
| 6 | Room 106 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110 | 9 | T 28 R F 4 | F44SSILL | 96 | 0.9 | SW | 2,400 | 2,074 | 1,037 | 0.4 | \$ 197.10 \$ 12.00 | \$ 1,275.75 | \$90 \$40 | 6.5 | 1.1 |
| 6 | Room 106 Room 105 | 9 | T 34 R F 4 (MAG) | F42EE | 144 | 1.3 | SW | 2400 | 3,110 | 4 9 | T 28 R F 4 | F42SSILL F44SSILL | 48 96 | 0.2 | SW | 2,400 | 2,074 | 1,037 | 0.1 | \$ 43.80 \$ 197.10 | \$ | \$40 \$90 | 6.5 | 1.8 |
| 11 | Room 105 | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.3 | SW | 2400 | 691 | 4 | S 28 P F 2 | F42SSILL | 48 | 0.2 | SW | 2,400 | 461 | 230 | 0.1 | \$ 43.80 \$ 107.10 | \$ 459.00 \$ 1.275.75 | \$40 \$90 | 10.5 | 1.8 |
| | Room 104 | 6 | S 34 P F 2 (MAG) | F44EE | 72 | 0.4 | SW | 2400 | 1,037 | 6 | S 28 P F 2 | F42SSILL | 48 | 0.3 | SW | 2,400 | <u>2,074</u> 691 | 346 | 0.4 | \$ 197.10 \$ 65.70 | \$ 1,275.75 \$ 688.50 | \$90 \$60 | 10.5 | 1.1 |
| 6 11 | Room 103 | 9 | T 34 R F 4 (MAG) | F44EE F42EF | 144 | 1.3 | SW | 2400 | 3,110 | 9 | T 28 R F 4 S 28 P F 2 | F44SSILL F42SSILL | 96 48 | 0.9 | SW | 2,400 2,400 | 2,074 | 1,037 | 0.4 | \$ 197.10 \$ 65.70 | \$ 1,275.75 \$ 688.50 | \$90 \$60 | 6.5 10.5 | 1.1 |
| 6 | Room 102 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110 | 9 | T 28 R F 4 | F44SSILL | 96 | 0.9 | SW | 2,400 | 2,074 | 1,037 | 0.4 | \$ 197.10 | \$ 1,275.75 | \$90 | 6.5 | 1.1 |
| 11 11 | Room 102 Doorway - 4 | 6 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE | 72 | 0.4 | SW SW | 2400 2280 | <u>1,037</u> 164 | 6 | S 28 P F 2 S 28 P F 2 | F42SSILL F42SSILL | 48 48 | 0.3 | SW SW | 2,400 2,280 | <u> </u> | 346 55 | 0.1 | \$ 65.70 \$ 10.49 | \$ 688.50 \$ 114.75 | \$60 \$10 | 10.5 10.9 | <u>1.8</u> 1.9 |
| 71 | North Custodial Closet | 1 | | I60/1 | 60 | 0.1 | SW | 1000 | 60 | 1 | CF 26 | CFQ26/1-L | 27 | 0.0 | SW | 1,000 | 27 | 33 | 0.0 | \$ 7.71 \$ 14.80 | \$ 6.75 \$ 450.00 | \$0 \$40 | 0.9 | 0.2 |
| 11 | Girl's Bathroom | 4 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE | 72 | 0.3 | SW | 500 | 144 | 4 | S 28 P F 2 S 28 P F 2 | F42SSILL F42SSILL | 48 | 0.2 | SW | 500 | 96 | 48 | 0.1 | \$ 14.80 \$ 14.80 | \$ 459.00 \$ 459.00 | \$40 \$40 | 31.0 | 8.7 |
| 6 11 | Room 101 | 9 | T 34 R F 4 (MAG) | F44EE F42EE | 144 | 1.3 | SW | 2400 | 3,110 | 9 | T 28 R F 4 | F44SSILL F42SSILL | 96 48 | 0.9 | SW | 2,400 | 2,074 | 1,037 | 0.4 | \$ 197.10 \$ 65.70 | \$ 1,275.75 \$ 688.50 | \$90 \$60 | 6.5 10.5 | 1.1 |
| 6 | Library | 22 | T 34 R F 4 (MAG) | F44EE | 144 | 3.2 | SW | 2400 | 7,603 | 22 | T 28 R F 4 | F44SSILL | 96 | 2.1 | SW | 2,400 | 5,069 | 2,534 | 1.1 | \$ 481.79 | \$ 3,118.50 | \$220 | 6.5 | 1.1 |
| <u>11</u> 6 | Library Server Room Room 116 | 2 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44FF | 72 | 0.1 | SW SW | 1000 2400 | <u> </u> | 2 12 | S 28 P F 2 T 28 R F 4 | F42SSILL F44SSILI | 48 | 0.1 | SW SW | 1,000 | 96 2,765 | 48 | 0.0 | \$ 11.21 \$ 262.79 | \$ 229.50 \$ 1.701.00 | \$20 \$120 | 20.5 6.5 | 4.4 |
| 11 | Room 116 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 2400 | 1,037 | 6 | S 28 P F 2 | F42SSILL | 48 | 0.3 | SW | 2,400 | 691 | 346 | 0.1 | \$ 65.70 | \$ 688.50 | \$60 | 10.5 | 1.8 |
| 6 11 | Room 115 Room 115 | <u>12</u> 6 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | <u> </u> | 1.7 | SW SW | 2400 2400 | 4,147 | 12 6 | T 28 R F 4 S 28 P F 2 | F44SSILL F42SSILL | 96 48 | 0.3 | SW SW | 2,400 2,400 | <u>2,765</u> 691 | 1,382 | 0.6 0.1 | \$ 262.79 \$ 65.70 | \$ 1,701.00 \$ 688.50 | \$120 \$60 | 6.5 10.5 | <u> </u> |
| 11 | Boiler Room - 1 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 1000 | 432 | 6 | S 28 P F 2 | F42SSILL | 48 | 0.3 | SW | 1,000 | 288 | 144 | 0.1 | \$ 33.64 | \$ 688.50 \$ 244.25 | \$60 \$20 | 20.5 | 4.4 |
| 78 | Nurse | 1 | EP I 100 | I100/1 | 100 | 0.2 | SW | 2400 | 240 | 3 1 | CF 26 | CFQ26/1-L | 48 27 | 0.1 | SW | 2,400 | <u> </u> | 173 | 0.1 | \$ 32.85 \$ 33.31 | \$ 344.25 \$ 20.25 | \$30 \$0 | 0.6 | 0.1 |
| 11 | Nurse | 1 4 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EF | 72 | 0.1 | SW | 2400 | <u> </u> | 1 4 | S 28 P F 2 S 28 P F 2 | F42SSILL F42SSILL | 48 | 0.0 | SW | 2,400 2,400 | <u>115</u> 461 | 58 230 | 0.0 | \$ 10.95 \$ 43.80 | \$ 114.75 \$ 459.00 | \$10 \$40 | 10.5 10.5 | 1.8 1.8 |
| 71 | Nurse | 1 | 160 | I60/1 | 60 | 0.0 | SW | 2400 | 144 | 1 | CF 26 | CFQ26/1-L | 27 | 0.0 | SW | 2,400 | 65 | 79 | 0.0 | \$ 15.06 | \$ 6.75 | \$0 | 0.4 | 0.1 |
| 6 11 | Room 122 Custodian Office | 2 3 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | <u> </u> | 0.3 | SW SW | 2400 2400 | <u> </u> | 2 3 | T 28 R F 4 S 28 P F 2 | F44SSILL F42SSILL | 96 48 | 0.2 | SW SW | 2,400 2,400 | <u>461</u> 346 | 230 173 | 0.1 | \$ 43.80 \$ 32.85 | \$ 283.50 \$ 344.25 | \$20 \$30 | 6.5 10.5 | <u>1.1</u> 1.8 |
| 6 | Room 114 | 2 | T 34 R F 4 (MAG) | F44EE | 144 | 0.3 | SW | 2400 | 691 | 2 | T 28 R F 4 | F44SSILL | 96 | 0.2 | SW | 2,400 | 461 | 230 | 0.1 | \$ 43.80 | \$ 283.50 \$ 567.00 | \$20 \$40 | 6.5 | 1.1 |
| 6 | Board of Education Room | 4 | T 34 R F 4 (MAG) T 34 R F 4 (MAG) | F44EE F44EE | 144 | 0.6 | SW | 2400 | 1,382 | 4 | T 28 R F 4 | F44SSILL F44SSILL | 96 | 0.4 | SW | 2,400 | 922 | 461 | 0.2 | \$ 87.60 \$ 87.60 | \$ 567.00 \$ 567.00 | \$40 \$40 | 6.5 6.5 | 1.1 |
| <u>11</u> | Board of Education Room Business Administrator | 3 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44FF | 72 | 0.2 | SW | 2400 | 518 1 382 | 3 | S 28 P F 2 T 28 R F 4 | F42SSILL F44SSILL | 48 | 0.1 | SW | 2,400 2,400 | 346 922 | 173 461 | 0.1 | \$ 32.85 \$ 87.60 | \$ 344.25 \$ 567.00 | \$30 \$40 | 10.5 6.5 | 1.8 1 1 |
| 11 | Business Administrator | 3 | S 34 P F 2 (MAG) | F42EE | 72 | 0.2 | SW | 2400 | 518 | 3 | S 28 P F 2 | F42SSILL | 48 | 0.1 | SW | 2,400 | 346 | 173 | 0.1 | \$ 32.85 | \$ 344.25 | \$30 | 10.5 | 1.8 |
| 6 11 | Room 113 Room 113 | 9 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | 144 72 | 1.3 0.4 | SW SW | 2400 2400 | <u>3,110</u> 1,037 | 9 | T 28 R F 4 S 28 P F 2 | F44SSILL F42SSILL | 96 42 | 0.9 | SW | 2,400 2,400 | 2,074 605 | 1,037 432 | 0.4 | \$ 197.10 \$ 82.12 | \$ 1,275.75 \$ 688.50 | \$90 \$60 | 6.5 8.4 | <u> </u> |
| 6 | Room 112 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110 | 9 | T 28 R F 4 | F44SSILL | 96 | 0.9 | SW | 2,400 | 2,074 | 1,037 | 0.4 | \$ 197.10 \$ 05.70 | \$ 1,275.75 | \$90 | 6.5 | 1.1 |
| 8 | Cafeteria | 18 | MH 175 | MH175/1 | 215 | 3.9 | SW | 1600 | 6,192 | 18 | FXLED39 | F4255ILL FXLED39/1 | 48 39 | 0.3 | SW | 2,400 | 1,123 | 5,069 | 0.1 3.2 | \$ 65.70 \$ 1,042.40 | \$ | \$60 \$1,800 | 8.3 | 1.8 |
| 11 71 | Kitchen Walk-in Freezer | 15 | S 34 P F 2 (MAG) | F42EE | 72 60 | 1.1 | SW | 1600 | 1,728 | 15 | S 28 P F 2 CF 26 | F42SSILL CEQ26/1-I | 48 | 0.7 | SW | 1,600 | <u>1,152</u> 27 | 576 33 | 0.4 | \$ 118.45 \$ 7.71 | \$ 1,721.25 \$ 6.75 | \$150 \$0 | 14.5 0.9 | 2.7 |
| 71 | Walk-in Freezer | 1 | | I60/1 | 60 | 0.1 | SW | 1000 | 60 | 1 | CF 26 | CFQ26/1-L | 27 | 0.0 | SW | 1,000 | 27 | 33 | 0.0 | \$ 7.71 | \$ 6.75 | \$0 \$0 | 0.9 | 0.2 |
| 6 11 | Room 111 Room 111 | <u>9</u> 6 | S 34 P F 2 (MAG) | F44EE F42EE | <u> </u> | 1.3 0.4 | SW SW | 2400 | <u>3,110</u> 1,037 | 6 | 0 1 28 R F 4 | F44SSILL F42SSILL | 96 42 | 0.9 | SW | 2,400 2,400 | 2,074 605 | 1,037 | 0.4 | \$ 197.10 \$ 82.12 | \$ 1,275.75 \$ 688.50 | \$90 \$60 | 6.5 8.4 | 1.1 1.5 |
| 6 | Room 112 Room 112 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110 | 9 | T 28 R F 4 | F44SSILL | 96 | 0.9 | SW | 2,400 | 2,074 | 1,037 | 0.4 | \$ 197.10 \$ 65.70 | \$ 1,275.75 \$ 688.50 | \$90 \$60 | 6.5 10.5 | 1.1 |
| 6 | Room 110 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110 | 9 | T 28 R F 4 | F44SSILL | 96 | 0.9 | SW | 2,400 | 2,074 | 1,037 | 0.4 | \$ 03.70 \$ 197.10 | \$ 1,275.75 | \$90 | 6.5 | 1.0 |
| <u>11</u> 6 | Room 110 Room 109 | 6 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44EE | 72 144 | 0.4 | SW SW | 2400 2400 | <u>1,037</u> 3.110 | 6 9 | S 28 P F 2 T 28 R F 4 | F42SSILL F44SSILL | 48 96 | 0.3 | SW SW | 2,400 2.400 | <u> </u> | 346 | 0.1 | \$ 65.70 \$ 197.10 | \$ 688.50 \$ 1.275.75 | \$60 \$90 | 10.5 6.5 | <u>1.8</u> 1.1 |
| 11 | Room 109 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 2400 | 1,037 | 6 | S 28 P F 2 | F42SSILL | 48 | 0.3 | SW | 2,400 | 691 | 346 | 0.1 | \$ 65.70 | \$ 688.50 | \$60 \$00 | 10.5 | 1.8 |
| 6 11 | Room 108 Room 108 | 6 | S 34 P F 2 (MAG) | F44EE F42EE | 72 | 0.4 | SW | 2400 | 1,037 | 9 6 | S 28 P F 2 | F44SSILL F42SSILL | 48 | 0.9 | SW | 2,400 | 2,074 | 346 | 0.4 | \$ 197.10 \$ 65.70 | \$ 1,275.75 \$ 688.50 | \$90 \$60 | 6.5 10.5 | 1.1 |
| 6 11 | Room 107 Room 107 | 9 | T 34 R F 4 (MAG) | F44EE F42EF | 144 | 1.3 | SW | 2400 | 3,110 | 9 | T 28 R F 4 S 28 P F 2 | F44SSILL F42SSILL | 96 48 | 0.9 | SW | 2,400 2,400 | 2,074 | 1,037 | 0.4 | \$ 197.10 \$ 65.70 | \$ 1,275.75 \$ 688.50 | \$90 \$60 | 6.5 10.5 | 1.1 |
| 78 | Cafeteria | 18 | EP I 100 | l100/1 | 100 | 1.8 | SW | 1600 | 2,880 | 18 | CF 26 | CFQ26/1-L | 27 | 0.5 | SW | 1,600 | 778 | 2,102 | 1.3 | \$ 432.36 | \$ 364.50 | \$0 \$0 | 0.8 | 0.2 |
| 6 257 | Main Office Main Entrance | 10 | T 34 R F 4 (MAG) CF11W | CF11/2 | <u> </u> | 0.3 | SW SW | 2400 2280 | <u>3,456</u> 593 | 10 10 | T 28 R F 4 CF11W | CF11/2 | 96 26 | 0.3 | SW SW | 2,400 2,280 | 2,304 593 | 1,152 | 0.5 0.0 | \$ | \$ 1,417.50 \$ - | \$100 \$0 | 6.5 | 1.1 |
| 35 | Room 117 Room 118 | 6 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | SW | 2400 | 1,296 | 6 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | SW | 2,400 | 1,296 | - | 0.0 | \$- \$- | \$- \$- | \$0 \$0 | | |
| 35 | Computer Lab | 9 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.3 | SW | 2400 | 1,290 | 9 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.8 | SW | 2,400 | 1,290 | - | 0.0 | \$ - | \$ - | \$0 \$0 | | |
| 13 13 | Storage Room Faculty Bathroom | 3 | S 32 P F 2 (ELE) S 32 P F 2 (ELE) | F42LL F42LL | 60 60 | 0.2 | SW SW | 1000 500 | <u>180</u> 30 | 3 | S 28 P F 2 S 28 P F 2 | F42SSILL F42SSILL | 48 48 | 0.1 | SW SW | 1,000 500 | 144 24 | 36 6 | 0.0 | \$ 8.41 \$ 1.85 | \$ 344.25 \$ 114.75 | \$30 \$10 | 40.9 62.0 | 8.7 17.5 |
| 35 | Physical Education Office | 5 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | SW | 2400 | 1,080 | 5 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | SW | 2,400 | 1,080 | - | 0.0 | \$ - | \$ - | \$0 \$100 | 10.0 | 0.7 |
| 13 13 | Electrical Room | 10 | S 32 P F 2 (ELE) S 32 P F 2 (ELE) | F42LL F42LL | 60 | 0.6 | SW | 1000 | <u> </u> | 10 | S 28 P F 2 S 28 P F 2 | F42SSILL F42SSILL | 48 48 | 0.5 | SW | 1,000 | <u>480</u> 96 | 120 | 0.1 | \$ 28.04 \$ 5.61 | \$ 1,147.50 \$ 229.50 | \$100 \$20 | 40.9 | <u>8.7</u> 8.7 |
| 18 13 | Art Room Art Room Storage | 15 | T 32 R F 4 (ELE) | F44ILL F42LL | <u> </u> | 1.7 | SW | 2400 | 4,032 | 15 | T 28 R F 4 S 28 P F 2 | F44SSILL F42SSILL | 96 48 | 1.4 | SW | 2,400 | 3,456 | 576 24 | 0.2 | \$ 109.50 \$ 5.61 | \$ 1,721.25 \$ 229.50 | \$150 \$20 | 15.7 40.9 | 2.7 |
| 13 | Art Room Storage | 2 | S 32 P F 2 (ELE) | F42LL | 60 | 0.1 | SW | 1000 | 120 | 2 | S 28 P F 2 | F42SSILL | 48 | 0.1 | SW | 1,000 | 96 | 24 | 0.0 | \$ 5.61 | \$ 229.50 | \$20 | 40.9 | 8.7 |
| 71 9LED | Art Room Gymnasium | <u>6</u> 40 | I 60 High Bay MH 200 35 Feet High | I60/1 MH200/1 | 60 232 | 0.4 9.3 | SW SW | 2400 | 864 18,560 | 6 40 | CF 26 FXLED78 | CFQ26/1-L FXLED78/1 | 27 78 | 0.2 | SW SW | 2,400 2,000 | <u>389</u> 6,240 | 475 | 0.2 6.2 | \$ 90.34 \$ 2,418.66 | \$ 40.50 \$ 39,189.00 | \$0 \$6,000 | 0.4 | 0.1 |
| 18 | Music Room | 15 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.7 | SW | 2400 | 4,032 | 15 | T 28 R F 4 | F44SSILL | 96 | 1.4 | SW | 2,400 | 3,456 | 576 | 0.2 | \$ 109.50 \$ 5.61 | \$ 1,721.25 \$ 220.50 | \$150 \$20 | 15.7 | 2.7 |
| 257 | Hallway 6 | 8 | CF11W | CF11/2 | 26 | 0.1 | SW | 2280 | 474 | 8 | CF11W | CF11/2 | 26 | 0.1 | SW | 2,280 | 96 474 | - 24 | 0.0 | ψ 5.01 \$ - | ψ ∠∠9.50 \$ - | \$0 | 40.9 | 0./ |
| 18 | Room 124 Child Study Office | 8 | T 32 R F 4 (ELE) | F44ILL F44II I | 112 | 0.9 | SW SW | 2400 2400 | 2,150 | 8 | T 28 R F 4 | F44SSILL F44SSILL | 96 96 | 0.8 | SW | 2,400 | 1,843 2 765 | 307 461 | 0.1 | \$ 58.40 \$ 87.60 | \$ 918.00 \$ 1.377.00 | \$80 \$120 | 15.7 15.7 | 2.7 |
| 13 | Storage | 1 | S 32 P F 2 (ELE) | F42LL | 60 | 0.1 | SW | 1000 | 60 | 1 | S 28 P F 2 | F42SSILL | 48 | 0.0 | SW | 1,000 | 48 | 12 | 0.0 | \$ 2.80 | \$ 114.75 | \$10 | 40.9 | 8.7 |
| 13 13 | Boys Bathroom Girl's Bathroom | 4 4 | S 32 P F 2 (ELE) S 32 P F 2 (ELE) | F42LL F42LL | 60 60 | 0.2 | SW SW | 500 500 | <u>120</u> 120 | 4 4 | S 28 P F 2 S 28 P F 2 | F42SSILL F42SSILL | 48 48 | 0.2 | SW SW | 500 500 | 96 96 | 24 | 0.0 0.0 | \$ 7.40 \$ 7.40 | \$ 459.00 \$ 459.00 | \$40 \$40 | 62.0 62.0 | 17.5 17.5 |
| 18 | Room 123 | 7 | T 32 R F 4 (ELE) | F44ILL | 112 | 0.8 | SW | 2400 | 1,882 | 7 | T 28 R F 4 | F44SSILL | 96 | 0.7 | SW | 2,400 | 1,613 | 269 | 0.1 | \$ 51.10 \$ 65.70 | \$ 803.25 \$ 1.000.75 | \$70 \$90 | 15.7 | 2.7 |
| 18 | Room 118 K | 13 | T 32 R F 4 (ELE) | F44ILL F44ILL | 112 | 1.5 | SW | 2400 | 3,494 | 9 13 | T 28 R F 4 | F44SSILL F44SSILL | 96 | 1.2 | SW | 2,400 | 2,074 | 499 | 0.1 | ψ 65.70 \$ 94.90 | \$ 1,491.75 | \$130 | 15.7 | 2.7 |
| 18 18 | Room 121 Hallway 5 | 12 | T 32 R F 4 (ELE) | F44ILL F44II I | 112 | 1.3 | SW SW | 2400 2280 | 3,226 3,830 | 12 15 | T 28 R F 4 | F44SSILL F44SSILL | 96 96 | 1.2 | SW | 2,400 2.280 | 2,765 | 461 547 | 0.2 | \$ 87.60 \$ 104.92 | \$ 1,377.00 \$ 1,721.25 | \$120 \$150 | 15.7 16.4 | 2.7 |
| 18 | Hallway | 18 | T 32 R F 4 (ELE) | F44ILL | 112 | 2.0 | SW | 2280 | 4,596 | 18 | T 28 R F 4 | F44SSILL | 96 | 1.7 | SW | 2,280 | 3,940 | 657 | 0.3 | \$ 125.90 | \$ 2,065.50 | \$180 | 16.4 | 2.9 |
| 18 18 | Room 120 Room 119 | 12 | T 32 R F 4 (ELE) T 32 R F 4 (ELE) | F44ILL F44ILL | 112 112 | 1.3 | SW SW | 2400 | 3,226 3,226 | 12 12 | T 28 R F 4 | F44SSILL F44SSILL | 96 96 | 1.2 | SW | 2,400 2,400 | 2,765 2,765 | 461 | 0.2 | > 87.60 \$ 87.60 | \$ 1,377.00 \$ 1,377.00 | \$120 \$120 | 15.7 15.7 | 2.7 |
| 257 | Hallway | 11 | CF11W | CF11/2 | 26 | 0.3 | SW | 2280 | 652 | 11 | CF11W | CF11/2 | 26 | 0.3 | SW | 2,280 | 652 | - | 0.0 | \$- | \$- | \$0 | | |

Cost of Electricity: \$0.159 \$/kWh

\$6.22 \$/kW

Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735 ECM-7 Lighting Replacements

| | | | | EXISTING CON | DITIONS | | | | | | | | RETROFIT (| | S | | | | | 0.0 | ST & SAVI | NGS ANALYS | SIS | | |
|---------------|--|---|---|---|---------------------------------|---|--|---|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|---|--|
| Field Code | Area Description Unique description of the location - Room number/Ro name: Floor number (if applicable) | No. of Fixtures bom No. of fixtures before the | Standard Fixture Code "Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w | Fixture Code Code from Table of Standard Fixture Wattages | Watts per Fixture | kW/Space (Watts/Fixt) * (Fixt No.) | Exist Control Pre-inst. control | Annual Hours Estimated daily hours for the | Annual kWh (kW/space) * (Annual Hours) | Number of Fixtures Fixtures No. of fixtures after the retro | of Standard "Lighting Fixtur fit 2T 40 R F(U) | I Fixture Code re Code" Example = 2'x2' Troff 40 | Fixture Code Code from Table of Standard Fixture | Watts per Fixture Value from Table of | kW/Space (Watts/Fixt) * (Number of | Retrofit Control Retrofit control | Annual Hours Estimated annual hours | Annual kWh (kW/space) * (Annual | Annual kWh Saved (Original Annua kWh) - (Retrofit | Annual kW Saved I (Original Annua kW) - (Retrofit | Annual \$ Saved (kWh Saved) ⁵ (\$/kWh) | Retrofit Cost Cost for renovations to | NJ Smart Start Lighting Incentive Prescriptive Lighting | Simple Payback With Out Incentive Length of time for renovations | Simple Payback Length of time for renovations cost to |
| | | retrofit | Recess. Floor 2 lamps U shape | | Standard Fixture Wattages | | device | usage group | | | w Recess. Floo | or 2 lamps U shape | Wattages | Standard Fixture Wattages | Fixtures) | device | for the usage group | Hours) | Annual kWh) | Annual kW) | | lighting system | Measures | cost to be recovered | be recovered |
| 11 | Faculty Room | 5 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 2400 | 864 | 5 | S 28 P F 2 | | F42SSILL | 48 | 0.2 | SW | 2,400 | 576 | 288 | 0.1 | \$ 54.7 | 5 \$ 573.75 | \$50 | 10.5 | 1.8 |
| 11 | Men's Bathroom | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 500 | 36 | 1 | S 28 P F 2 | | F42SSILL | 48 | 0.0 | SW | 500 | 24 | 12 | 0.0 | \$ 3.70 | 0 \$ 114.75 | \$10 | 31.0 | 8.7 |
| 11 | Women's Bathroom | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 500 | 36 | 1 | S 28 P F 2 | | F42SSILL | 48 | 0.0 | SW | 500 | 24 | 12 | 0.0 | \$ 3.70 | 0 \$ 114.75 | \$10 | 31.0 | 8.7 |
| 8 | Exterior | 44 | MH 175 | MH175/1 | 215 | 9.5 | SW | 4368 | 41,321 | 44 | FXLED39 | | FXLED39/1 | 39 | 1.7 | SW | 4,368 | 7,495 | 33,826 | 7.7 | \$ 5,956.3 | 1 \$ 21,087.00 | \$4,400 | 3.5 | 0.5 |
| 73 | Exterior | 16 | I 120 | l120/1 | 120 | 1.9 | SW | 4368 | 8,387 | 16 | CF 26 | | CFQ26/1-L | 27 | 0.4 | SW | 4,368 | 1,887 | 6,500 | 1.5 | \$ 1,144.50 | 0 \$ 108.00 | \$0 | 0.1 | 0.0 |
| 93 | Exterior Shed | 5 | 1 75 | 175/1 | 75 | 0.4 | SW | 4368 | 1,638 | 5 | CF 26 | | CFQ26/1-L | 27 | 0.1 | SW | 4,368 | 590 | 1,048 | 0.2 | \$ 184.60 | 0 \$ 27.00 | \$0 | 0.1 | 0.0 |
| 11 | Exterior Shed | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 4368 | 314 | 1 | S 28 P F 2 | | F42SSILL | 48 | 0.0 | SW | 4,368 | 210 | 105 | 0.0 | \$ 18.46 | 6 \$ 114.75 | \$10 | 6.2 | 1.0 |
| | Total | 778 | | | | 91.4 | | | 227,328 | 778 | | | | 6,297 | 53.9 | | | 126,638 | 100,690 | 37.5 | \$18,808 | \$140,358 | \$17,910 | | |
| - | | | | | | | | | | | | | | | | | | Deman | d Savings | | 37.5 | \$2,798 | | | |
| | | | | | | | | | | | | | | | | | | kWh | Savings | | 100,690 | \$16,010 | | | |
| | | | | | | | | | | | | | | | | | | Total | savings | | | \$18,808 | | 7.5 | 6.5 |

Cost of Electricity: \$0.159 \$/kWh

\$6.22 \$/kW

Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735 ECM-8 Install Occupancy Sensors

| Normal Normal Normal Normal </th <th></th> <th></th> <th colspan="7">EXISTING CONDITIONS</th> <th></th> <th></th> <th></th> <th>RETROFIT</th> <th>CONDITION</th> <th>IS</th> <th></th> <th></th> <th></th> <th></th> <th>COS</th> <th>T & SAVING</th> <th>S ANALY</th> <th>SIS</th> <th></th> <th></th> | | | EXISTING CONDITIONS | | | | | | | | | | RETROFIT | CONDITION | IS | | | | | COS | T & SAVING | S ANALY | SIS | | |
|--|--------------------|---|---|---|---|---|------------------------------|--------------------------------|---|------------------------------------|---------------------------------------|---|--|---|---|-------------------------------|---|-----------------------------------|---|--|--------------------------------|--|--|--|---|
| No. No. No. No. No. | | 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 kWł Saved | n 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 annual hours for the usage group | (kW/space) * 1 (Annual Hours) a | 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 Annua kWh) - (Retrofi Annual kWh) | al (Original Annual t 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 |
| 1 | 11 | Doorway - 3 | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 2280 | 164.2 | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 2280 | 164.2 | 0.0 | 0.0 | \$0.00 | \$0.00 \$0.00 | \$0.00 | | |
| - | 11 6 | Room 106 | 9 | T 34 R F 4 (MAG) | F42EE | 144 | 1.3 | SW | 2280 | 3,110.4 | 9 | T 34 R F 4 (MAG) | F42EE F44EE | 144 | 1.3 | OCC | 1680 | 2,177.3 | 933.1 | 0.0 | \$0.00 \$148.37 | \$0.00 \$128.25 | \$0.00 \$20.00 | 0.9 | 0.7 |
| | <u>11</u> | Room 106 | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.3 | SW | 2400 | 691.2 | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.3 | 220 | 1680 | 483.8 | 207.4 | 0.0 | \$32.97 \$148.37 | \$128.25 \$128.25 | \$20.00 \$20.00 | 3.9 | 3.3 |
| I Model I Signed I Signed I Signed Signed Signed Signed Signe | 11 | Room 105 | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.3 | SW | 2400 | 691.2 | 4 | S 34 P F 2 (MAG) | F42EE | 72 | 0.3 | 000 | 1680 | 483.8 | 207.4 | 0.0 | \$32.97 | \$128.25 | \$20.00 | 3.9 | 3.3 |
| 1 Month 1 1 9 No 1 1 9 No 1 </td <td>6 11</td> <td>Room104 Room 104</td> <td>9</td> <td>T 34 R F 4 (MAG) S 34 P F 2 (MAG)</td> <td>F44EE F42EE</td> <td>144 72</td> <td><u> </u></td> <td>SW SW</td> <td>2400</td> <td>3,110.4</td> <td>9 6</td> <td>T 34 R F 4 (MAG) S 34 P F 2 (MAG)</td> <td>F44EE F42EE</td> <td><u> </u></td> <td>1.3 0.4</td> <td>000 000</td> <td><u> </u></td> <td>2,177.3 725.8</td> <td>933.1 311.0</td> <td>0.0</td> <td>\$148.37 \$49.46</td> <td>\$128.25 \$128.25</td> <td>\$20.00 \$20.00</td> <td>0.9 2.6</td> <td>0.7</td> | 6 11 | Room104 Room 104 | 9 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | 144 72 | <u> </u> | SW SW | 2400 | 3,110.4 | 9 6 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | <u> </u> | 1.3 0.4 | 000 000 | <u> </u> | 2,177.3 725.8 | 933.1 311.0 | 0.0 | \$148.37 \$49.46 | \$128.25 \$128.25 | \$20.00 \$20.00 | 0.9 2.6 | 0.7 |
| | 6 | Room 103 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110.4 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | 000 | 1680 | 2,177.3 | 933.1 | 0.0 | \$148.37 | \$128.25 | \$20.00 | 0.9 | 0.7 |
| | <u> 11</u> 6 | Room 103 Room 102 | <u> </u> | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44EE | 72 144 | 0.4 | SW SW | 2400 | 1,036.8 | <u> </u> | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44EE | <u> </u> | 0.4 | 0CC 0CC | <u> </u> | 725.8 2,177.3 | <u>311.0</u> 933.1 | 0.0 | \$49.46 \$148.37 | \$128.25 \$128.25 | \$20.00 \$20.00 | 2.6 0.9 | <u>2.2</u> 0.7 |
| All All <td>11</td> <td>Room 102 Doorway - 4</td> <td>6</td> <td>S 34 P F 2 (MAG)</td> <td>F42EE F42EE</td> <td>72 72</td> <td>0.4</td> <td>SW</td> <td>2400</td> <td>1,036.8</td> <td>6</td> <td>S 34 P F 2 (MAG) S 34 P F 2 (MAG)</td> <td>F42EE F42EE</td> <td>72 72</td> <td>0.4</td> <td>OCC SW</td> <td>1680</td> <td>725.8</td> <td>311.0</td> <td>0.0</td> <td>\$49.46 \$0.00</td> <td>\$128.25 \$0.00</td> <td>\$20.00 \$0.00</td> <td>2.6</td> <td>2.2</td> | 11 | Room 102 Doorway - 4 | 6 | S 34 P F 2 (MAG) | F42EE F42EE | 72 72 | 0.4 | SW | 2400 | 1,036.8 | 6 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE | 72 72 | 0.4 | OCC SW | 1680 | 725.8 | 311.0 | 0.0 | \$49.46 \$0.00 | \$128.25 \$0.00 | \$20.00 \$0.00 | 2.6 | 2.2 |
| I Max I Max I Max | 71 | North Custodial Closet | 1 | 160 0.04 D F 0 (MAQ) | | 60 | 0.1 | SW | 1000 | 60.0 | 1 | | | 60 | 0.1 | SW | 1000 | 60.0 | 0.0 | 0.0 | \$0.00 \$0.00 | \$0.00 \$0.00 | \$0.00 | | |
| I Description J Description All Description Descripti | 11 11 | Girl's Bathroom | 4 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE | 72 72 | 0.3 | SW | 500 | 144.0 | 4 4 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE | 72 | 0.3 | SW | 500 | 144.0 | 0.0 | 0.0 | \$0.00 \$0.00 | \$0.00 \$0.00 | \$0.00 \$0.00 | | |
| Streep Streep< | 6 11 | Room 101 Room 101 | 9 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | 144 72 | 1.3 0.4 | SW SW | 2400 | 3,110.4 | 9 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | 144 72 | 1.3 | 000 000 | <u> </u> | 2,177.3 725.8 | 933.1 311.0 | 0.0 | \$148.37 \$49.46 | \$128.25 \$128.25 | \$20.00 \$20.00 | 0.9 2.6 | 0.7 |
| Image: And the set of | 6 | Library | 22 | T 34 R F 4 (MAG) | F44EE | 144 | 3.2 | SW | 2400 | 7,603.2 | 22 | T 34 R F 4 (MAG) | F44EE | 144 | 3.2 | 000-0 | 1680 | 5,322.2 | 2,281.0 | 0.0 | \$362.67 | \$202.50 | \$35.00 | 0.6 | 0.5 |
| 1 No. 1 1 <td><u> 11</u> 6</td> <td>Room 116</td> <td>12</td> <td>T 34 R F 4 (MAG)</td> <td>F42EE</td> <td>144</td> <td>0.1</td> <td>SW</td> <td>2400</td> <td>4,147.2</td> <td>2 12</td> <td>T 34 R F 4 (MAG)</td> <td>F42EE F44EE</td> <td>144</td> <td>0.1</td> <td>OCC</td> <td>1000 1680</td> <td>2,903.0</td> <td>0.0</td> <td>0.0</td> <td>\$0.00 \$197.82</td> <td>\$0.00 \$128.25</td> <td>\$0.00 \$20.00</td> <td>0.6</td> <td>0.5</td> | <u> 11</u> 6 | Room 116 | 12 | T 34 R F 4 (MAG) | F42EE | 144 | 0.1 | SW | 2400 | 4,147.2 | 2 12 | T 34 R F 4 (MAG) | F42EE F44EE | 144 | 0.1 | OCC | 1000 1680 | 2,903.0 | 0.0 | 0.0 | \$0.00 \$197.82 | \$0.00 \$128.25 | \$0.00 \$20.00 | 0.6 | 0.5 |
| N | 11 | Room 116 Room 115 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 2400 | 1,036.8 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | 220 | 1680 | 725.8 | 311.0 | 0.0 | \$49.46 \$107.82 | \$128.25 \$128.25 | \$20.00 \$20.00 | 2.6 | 2.2 |
| N P N | 11 | Room 115 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 2400 | 1,036.8 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | 000 | 1680 | 725.8 | 311.0 | 0.0 | \$49.46 | \$128.25 | \$20.00 | 2.6 | 2.2 |
| Date Date <th< td=""><td>11</td><td>Boiler Room - 1</td><td>6</td><td>S 34 P F 2 (MAG)</td><td>F42EE</td><td>72</td><td>0.4</td><td>SW</td><td>1000</td><td>432.0</td><td>6</td><td>S 34 P F 2 (MAG)</td><td>F42EE</td><td>72</td><td>0.4</td><td>SW</td><td>1000</td><td>432.0</td><td>0.0</td><td>0.0</td><td>\$0.00 \$41.21</td><td>\$0.00 \$128.25</td><td>\$0.00 \$20.00</td><td>2.1</td><td>2.6</td></th<> | 11 | Boiler Room - 1 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 1000 | 432.0 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 1000 | 432.0 | 0.0 | 0.0 | \$0.00 \$41.21 | \$0.00 \$128.25 | \$0.00 \$20.00 | 2.1 | 2.6 |
| 1 | 78 | Nurse | 1 | EP I 100 | I100/1 | 100 | 0.2 | SW | 2400 | 240.0 | 1 | EP I 100 | 1100/1 | 100 | 0.2 | 000 | 1200 | 120.0 | 120.0 | 0.0 | \$19.08 | \$128.25 \$128.25 | \$20.00 \$20.00 | 6.7 | 5.7 |
| 1 1 1 1 1 1 0 - 0 | 11 11 | Nurse | 1 4 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE | 72 72 | 0.1 | SW SW | 2400 | 172.8 | <u>1</u> 4 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE | 72 72 | 0.1 | 000 000 | <u> </u> | 86.4 345.6 | 86.4 345.6 | 0.0 | \$13.74 \$54.95 | \$128.25 \$128.25 | \$20.00 \$20.00 | 9.3 2.3 | 7.9 |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | 71 | Nurse | 1 | | I60/1 | 60 | 0.1 | SW | 2400 | 144.0 | 1 | | I60/1 | 60 | 0.1 | 000 | 1200 | 72.0 | 72.0 | 0.0 | \$11.45 | \$128.25 | \$20.00 | 11.2 | 9.5 |
| I Description Description <thdescription< th=""> <thdescr< td=""><td>6 11</td><td>Custodian Office</td><td>3</td><td>S 34 P F 2 (MAG)</td><td>F44EE F42EE</td><td>144 72</td><td>0.3</td><td>SW</td><td>2400</td><td><u>691.2</u> 518.4</td><td>2 3</td><td>S 34 P F 2 (MAG)</td><td>F44EE F42EE</td><td>144 72</td><td>0.3</td><td>SW</td><td><u>1680</u> 2400</td><td>483.8 518.4</td><td>0.0</td><td>0.0</td><td>\$32.97 \$0.00</td><td>\$128.25 \$0.00</td><td>\$20.00 \$0.00</td><td>3.9</td><td>3.3</td></thdescr<></thdescription<> | 6 11 | Custodian Office | 3 | S 34 P F 2 (MAG) | F44EE F42EE | 144 72 | 0.3 | SW | 2400 | <u>691.2</u> 518.4 | 2 3 | S 34 P F 2 (MAG) | F44EE F42EE | 144 72 | 0.3 | SW | <u>1680</u> 2400 | 483.8 518.4 | 0.0 | 0.0 | \$32.97 \$0.00 | \$128.25 \$0.00 | \$20.00 \$0.00 | 3.9 | 3.3 |
| b b b b b b c b c | 6 | Room 114 Superintendent Office | 2 | T 34 R F 4 (MAG) | F44EE F44EF | 144 144 | 0.3 | SW | 2400 | 691.2 1 382 4 | 2 | T 34 R F 4 (MAG) T 34 R F 4 (MAG) | F44EE F44EE | 144 | 0.3 | 000 000 | 1680 | 483.8 691 2 | 207.4 | 0.0 | \$32.97 \$109 90 | \$128.25 \$128.25 | \$20.00 \$20.00 | 3.9 1.2 | 3.3 |
| Image: Loop: Appendix | 6 | Board of Education Room | 4 | T 34 R F 4 (MAG) | F44EE | 144 | 0.6 | SW | 2400 | 1,382.4 | 4 | T 34 R F 4 (MAG) | F44EE | 144 | 0.6 | 000 | 1200 | 691.2 | 691.2 | 0.0 | \$109.90 | \$128.25 | \$20.00 | 1.2 | 1.0 |
| II.1 Introde/marker J.1 VII.1 | <u>11</u> 6 | Board of Education Room Business Administrator | 3 4 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44EE | 72 144 | 0.2 | SW SW | 2400 | 518.4 | 3 4 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44EE | 72 144 | 0.2 | 000 000 | <u> </u> | 259.2 691.2 | 259.2 691.2 | 0.0 | \$41.21 \$109.90 | \$128.25 \$128.25 | \$20.00 \$20.00 | 3.1 1.2 | 2.6 |
| Image in the set of t | 11 | Business Administrator | 3 | S 34 P F 2 (MAG) | F42EE | 72 | 0.2 | SW | 2400 | 518.4 | 3 | S 34 P F 2 (MAG) | F42EE | 72 | 0.2 | 000 | 1200 | 259.2 | 259.2 | 0.0 | \$41.21 \$1.10.07 | \$128.25 | \$20.00 | 3.1 | 2.6 |
| A Bon 12 J Part Andors Heff H 10 962 Heff H 10 962 10 10 100 | 6 11 | Room 113 Room 113 | 9 6 | S 34 P F 2 (MAG) | F44EE F42EE | 72 | 0.4 | SW | 2400 | 1,036.8 | 9 6 | S 34 P F 2 (MAG) | F44EE F42EE | 72 | 0.4 | 000 | 1680 | 725.8 | 311.0 | 0.0 | \$148.37 \$49.46 | \$128.25 \$128.25 | \$20.00 \$20.00 | 0.9 2.6 | 2.2 |
| -1 Delta 10 Delta 13 13 14 14 15 14 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16 14 15 16 < | 6 | Room 112 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110.4 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | 000 | 1680 | 2,177.3 | 933.1 | 0.0 | \$148.37 \$40.46 | \$128.25 \$128.25 | \$20.00 | 0.9 | 0.7 |
| -11 -10 <td>8</td> <td>Cafeteria</td> <td>18</td> <td>MH 175</td> <td>MH175/1</td> <td>215</td> <td>3.9</td> <td>SW</td> <td>1600</td> <td>6,192.0</td> <td>18</td> <td>MH 175</td> <td>MH175/1</td> <td>215</td> <td>3.9</td> <td>000 000-0</td> <td>1680</td> <td>4,644.0</td> <td>1,548.0</td> <td>0.0</td> <td>\$49.46 \$246.13</td> <td>\$128.25 \$202.50</td> <td>\$20.00</td> <td>2.6 0.8</td> <td>0.7</td> | 8 | Cafeteria | 18 | MH 175 | MH175/1 | 215 | 3.9 | SW | 1600 | 6,192.0 | 18 | MH 175 | MH175/1 | 215 | 3.9 | 000 000-0 | 1680 | 4,644.0 | 1,548.0 | 0.0 | \$49.46 \$246.13 | \$128.25 \$202.50 | \$20.00 | 2.6 0.8 | 0.7 |
| Phil Obst Phil Phil <th< td=""><td>11 71</td><td>Kitchen Walk-in Freezer</td><td>15</td><td>S 34 P F 2 (MAG)</td><td>F42EE</td><td>72 60</td><td>1.1</td><td>SW</td><td>1600</td><td>1,728.0</td><td>15 1</td><td>S 34 P F 2 (MAG)</td><td>F42EE</td><td>72 60</td><td>1.1</td><td>SW SW</td><td>1600</td><td>1,728.0 60.0</td><td>0.0</td><td>0.0</td><td>\$0.00 \$0.00</td><td>\$0.00 \$0.00</td><td>\$0.00 \$0.00</td><td></td><td></td></th<> | 11 71 | Kitchen Walk-in Freezer | 15 | S 34 P F 2 (MAG) | F42EE | 72 60 | 1.1 | SW | 1600 | 1,728.0 | 15 1 | S 34 P F 2 (MAG) | F42EE | 72 60 | 1.1 | SW SW | 1600 | 1,728.0 60.0 | 0.0 | 0.0 | \$0.00 \$0.00 | \$0.00 \$0.00 | \$0.00 \$0.00 | | |
| A Boot 11 3 12 B2 Fullow Petal 1-4 3.0 100 1.0 100 100 100 </td <td>71</td> <td>Walk-in Freezer</td> <td>1</td> <td>160</td> <td>I60/1</td> <td>60</td> <td>0.1</td> <td>SW</td> <td>1000</td> <td>60.0</td> <td>1</td> <td>160</td> <td>I60/1</td> <td>60</td> <td>0.1</td> <td>SW</td> <td>1000</td> <td>60.0</td> <td>0.0</td> <td>0.0</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td></td> <td></td> | 71 | Walk-in Freezer | 1 | 160 | I60/1 | 60 | 0.1 | SW | 1000 | 60.0 | 1 | 160 | I60/1 | 60 | 0.1 | SW | 1000 | 60.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | | |
| 4 Rer 5 9 547 F 366. Heff 14 13 80 156. | 6 11 | Room 111 Room 111 | 9 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | 144 72 | <u> </u> | SW SW | 2400 | 3,110.4 | 9 6 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | <u> </u> | 0.4 | 000 000 | <u> </u> | 2,177.3 725.8 | 933.1 311.0 | 0.0 | \$148.37 \$49.46 | \$128.25 \$128.25 | \$20.00 \$20.00 | 0.9 2.6 | 0.7 |
| 1 $n_{\rm env}$ $i_{\rm env}$ i | 6 | Room 112 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110.4 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | 000 | 1680 | 2,177.3 | 933.1 | 0.0 | \$148.37 | \$128.25 | \$20.00 | 0.9 | 0.7 |
| Hore 13 G Super 13 May: G Super 13 May: G Super 13 May: File Super 13 May: Super 1 | 11 6 | Room 112 Room 110 | <u> </u> | T 34 R F 4 (MAG) | F42EE F44EE | 144 | 1.3 | SW | 2400 | 1,036.8 | <u> </u> | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44EE | 144 | 1.3 | 000 | <u> </u> | 725.8 2,177.3 | 933.1 | 0.0 | \$49.46 \$148.37 | \$128.25 \$128.25 | \$20.00 \$20.00 | 2.6 0.9 | 0.7 |
| 1 | 11 | Room 110 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 2400 | 1,036.8 | 6 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | 000 | 1680 | 725.8 | 311.0 | 0.0 | \$49.46 | \$128.25 | \$20.00 | 2.6 | 2.2 |
| 6 Born 100 9 1 a 15 4 MoG Eds Lis 1 a 1 2 a 1 a 1 b 1 2 mode 1 a 1 b 1 2 mode 1 a 1 b 1 2 mode 1 m | 6 11 | Room 109 Room 109 | 9 6 | S 34 P F 2 (MAG) | F44EE F42EE | 72 | 0.4 | SW | 2400 | 1,036.8 | 9 6 | S 34 P F 2 (MAG) | F44EE F42EE | 72 | 0.4 | 000 | 1680 | 725.8 | 311.0 | 0.0 | \$148.37 \$49.46 | \$128.25 \$128.25 | \$20.00 \$20.00 | 0.9 2.6 | 2.2 |
| 6 8000 W/V 9 1544 F 4(MAG) 1444 14 13 0.02 <th0.02< th=""> 0.02 0.02</th0.02<> | 6 11 | Room 108 Room 108 | 9 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | 144 72 | 1.3 0.4 | SW SW | 2400 2400 | 3,110.4 | <u> </u> | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE | <u> </u> | 1.3 0.4 | 000 000 | <u> </u> | 2,177.3 725.8 | 933.1 311.0 | 0.0 | \$148.37 \$49.46 | \$128.25 \$128.25 | \$20.00 \$20.00 | 0.9 2.6 | 0.7 |
| D Definition Figs Definition Figs Definition Figs Definition Figs Definition Figs Definition Figs Definition Definition <thdefinition< th=""> Definition <</thdefinition<> | 6 | Room 107 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | SW | 2400 | 3,110.4 | 9 | T 34 R F 4 (MAG) | F44EE | 144 | 1.3 | 000 | 1680 | 2,177.3 | 933.1 | 0.0 | \$148.37 \$40.46 | \$128.25 \$128.25 | \$20.00 | 0.9 | 0.7 |
| 6 Main Critics 10 T1 R F C (MA); F4EE 144 10 754 F4 R F 4 MA); F4ET 144 144 160 1720 120 <th< td=""><td>78</td><td>Cafeteria</td><td>18</td><td>EP I 100</td><td>I100/1</td><td>12</td><td>1.8</td><td>SW</td><td>1600</td><td>2,880.0</td><td>18</td><td>EP I 100</td><td>I100/1</td><td>100</td><td>1.8</td><td>C-OCC</td><td>1200</td><td>2,160.0</td><td>720.0</td><td>0.0</td><td>پ، ۶.40 \$114.48</td><td>\$202.50</td><td>\$35.00</td><td>2.0 1.8</td><td>1.5</td></th<> | 78 | Cafeteria | 18 | EP I 100 | I100/1 | 12 | 1.8 | SW | 1600 | 2,880.0 | 18 | EP I 100 | I100/1 | 100 | 1.8 | C-OCC | 1200 | 2,160.0 | 720.0 | 0.0 | پ، ۶.40 \$114.48 | \$202.50 | \$35.00 | 2.0 1.8 | 1.5 |
| 35 Hom 177 6 128 k 3 54.5 Hom 177 6 128 k 3 54.5 Hom 177 6 128 k 3 54.5 Hom 178 6 128 k 3 54.5 Hom 178 | 6 257 | Main Office Main Entrance | 10 | T 34 R F 4 (MAG) CF11W | F44EE CF11/2 | 144 26 | 1.4 0.3 | SW SW | 2400 2280 | 3,456.0 592.8 | <u>10</u> 10 | T 34 R F 4 (MAG) CF11W | F44EE CF11/2 | 144 26 | 1.4 0.3 | OCC SW | 1200 2280 | 1,728.0 592.8 | 1,728.0 0.0 | 0.0 | \$274.75 \$0.00 | \$128.25 \$0.00 | \$20.00 \$0.00 | 0.5 | 0.4 |
| is Description 1 Number Lift Number Lift <td>35</td> <td>Room 117</td> <td>6</td> <td>T 32 R F 3 (ELE)</td> <td>F43ILL/2</td> <td>90</td> <td>0.5</td> <td>SW</td> <td>2400</td> <td>1,296.0</td> <td>6</td> <td>T 32 R F 3 (ELE)</td> <td>F43ILL/2</td> <td>90</td> <td>0.5</td> <td>000</td> <td>1680</td> <td>907.2</td> <td>388.8</td> <td>0.0</td> <td>\$61.82 \$61.82</td> <td>\$128.25 \$128.25</td> <td>\$20.00</td> <td>2.1</td> <td>1.8</td> | 35 | Room 117 | 6 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | SW | 2400 | 1,296.0 | 6 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | 000 | 1680 | 907.2 | 388.8 | 0.0 | \$61.82 \$61.82 | \$128.25 \$128.25 | \$20.00 | 2.1 | 1.8 |
| 13 Stage P 2 (LE) F42LL 60 0.2 SW 100 100 1000 | 35 | Computer Lab | 9 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | SW | 2400 | 1,290.0 | 9 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | 230-2 | 1680 | 1,360.8 | 583.2 | 0.0 | \$92.73 | \$202.50 | \$35.00 | 2.1 | 1.8 |
| 36 Propertion 5. T 22 R F 3 (LE) FAUL2 90 1.5. 902 90.0 91.0 0.0 95.8.8 95.00 90.0 13 Baile Room 2 5.3 2 F 2.(LE) FAUL 00 0.0 90.0 90.0 90.0 10.0 90.0 90.0 90.0 10.0 90.0 | 13 13 | Storage Room Faculty Bathroom | 3 | S 32 P F 2 (ELE) S 32 P F 2 (ELE) | F42LL F42LL | 60 60 | 0.2 | SW SW | <u> </u> | 180.0 | 3 | S 32 P F 2 (ELE) S 32 P F 2 (ELE) | F42LL F42LL | 60 60 | 0.2 | SW SW | <u> </u> | 180.0 30.0 | 0.0 | 0.0 | \$0.00 \$0.00 | \$0.00 \$0.00 | \$0.00 \$0.00 | | |
| 15 Exercted Room 12 3 32 P F 2 (EE) F 42L 00 0.1 SW 1000 10.0 | 35 | Physical Education Office | 5 | T 32 R F 3 (ELE) | F43ILL/2 | 90 60 | 0.5 | SW | 2400 | 1,080.0 | 5 | T 32 R F 3 (ELE) | F43ILL/2 | 90 | 0.5 | | 1200 | 540.0 600.0 | 540.0 | 0.0 | \$85.86 \$0.00 | \$128.25 \$0.00 | \$20.00 \$0.00 | 1.5 | 1.3 |
| 18 ArR com 15 T 20 F 4 (EL) F44LL 112 1.7 SW 2400 4.03.0 15 T 20 F 4 (EL) F44LL 112 1.7 000 1.0 | 13 | Electrical Room | 2 | S 32 P F 2 (ELE) | F42LL | 60 | 0.0 | SW | 1000 | 120.0 | 2 | S 32 P F 2 (ELE) | F42LL | 60 | 0.0 | SW | 1000 | 120.0 | 0.0 | 0.0 | \$0.00 \$0.00 | \$0.00 \$0.00 | \$0.00 | | |
| 13 Art Room Shurage 2 S 32 P F 2 (ELS) F42L 60 0.1 SW 1000 120.0 0.0 100.0 | 18 13 | Art Room Art Room Storage | 15 | T 32 R F 4 (ELE) S 32 P F 2 (ELE) | F44ILL F42LL | 112 60 | 0.1 | SW SW | 2400 | 4,032.0 | <u>15</u> 2 | T 32 R F 4 (ELE) S 32 P F 2 (ELE) | F44ILL F42LL | <u> </u> | 0.1 | OCC SW | 1680 1000 | 2,822.4 | 1,209.6 0.0 | 0.0 | \$192.33 \$0.00 | \$128.25 \$0.00 | \$20.00 \$0.00 | 0.7 | 0.6 |
| n number u <td>13</td> <td>Art Room</td> <td>2</td> <td>S 32 P F 2 (ELE)</td> <td>F42LL</td> <td>60</td> <td>0.1</td> <td>SW</td> <td>1000</td> <td>120.0</td> <td>2</td> <td>S 32 P F 2 (ELE)</td> <td>F42LL</td> <td>60</td> <td>0.1</td> <td>SW</td> <td>1000</td> <td>120.0</td> <td>0.0</td> <td>0.0</td> <td>\$0.00 \$41.21</td> <td>\$0.00 \$128.25</td> <td>\$0.00</td> <td>0.4</td> <td>26</td> | 13 | Art Room | 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 | SW | 1000 | 120.0 | 0.0 | 0.0 | \$0.00 \$41.21 | \$0.00 \$128.25 | \$0.00 | 0.4 | 26 |
| 18 Music Room 15 T 32 R F 4 (ELE) F44LL 112 1.7 SW 2400 4,032.0 15 T 32 R F 4 (ELE) F44LL 112 1.7 SW 2400 4,032.0 15 T 32 R F 4 (ELE) F44LL 112 1.7 SW 2000 1000 120.0 0.0 0.00 50.00 < | 9LED | Gymnasium | 40 | High Bay MH 200 35 Feet High | MH200/1 | 232 | 9.3 | SW | 2400 | 18,560.0 | 40 | High Bay MH 200 35 Feet High | MH200/1 | 232 | 9.3 | 000 00-0 | 1800 | 16,704.0 | 1,856.0 | 0.0 | \$295.10 | \$202.50 | \$35.00 | 0.7 | 0.6 |
| 257 Halway 6 8 CF11/2 26 0.2 SW 2280 474.2 8 CF11/2 26 0.2 SW 2280 474.2 0.0 0.0 \$0.00 \$0. | 18 13 | Music Room Music Room Storage | 15 2 | T 32 R F 4 (ELE) S 32 P F 2 (ELE) | F44ILL F42LL | 112 60 | 1.7 0.1 | SW SW | 2400 1000 | 4,032.0 | 15 2 | T 32 R F 4 (ELE) S 32 P F 2 (ELE) | F44ILL F42LL | 112 60 | 1.7 0.1 | OCC SW | 1680 1000 | 2,822.4 120.0 | 1,209.6 0.0 | 0.0 | \$192.33 \$0.00 | \$128.25 \$0.00 | \$20.00 \$0.00 | 0.7 | 0.6 |
| Normalize Construction Construction <td>257</td> <td>Hallway 6</td> <td>8</td> <td></td> <td>CF11/2</td> <td>26</td> <td>0.2</td> <td>SW</td> <td>2280</td> <td>474.2</td> <td>8 Q</td> <td></td> <td>CF11/2</td> <td>26</td> <td>0.2</td> <td>SW</td> <td>2280</td> <td>474.2</td> <td>0.0</td> <td>0.0</td> <td>\$0.00 \$102.57</td> <td>\$0.00 \$128.25</td> <td>\$0.00</td> <td>1 2</td> <td></td> | 257 | Hallway 6 | 8 | | CF11/2 | 26 | 0.2 | SW | 2280 | 474.2 | 8 Q | | CF11/2 | 26 | 0.2 | SW | 2280 | 474.2 | 0.0 | 0.0 | \$0.00 \$102.57 | \$0.00 \$128.25 | \$0.00 | 1 2 | |
| 13 Storage 1 S 22 P 2 (ELE) F42LL 60 0.1 SW 1000 60.0 1 S 32 P F 2 (ELE) F42LL 60 0.1 SW 1000 60.0 1 S 32 P F 2 (ELE) F42LL 60 0.1 SW 1000 60.0 \$120.0 4 S 32 P F 2 (ELE) F42LL 60 0.2 SW 500 120.0 4 S 32 P F 2 (ELE) F42LL 60 0.2 SW 500 120.0 4 S 32 P F 2 (ELE) F42LL 60 0.2 SW 500 120.0 4 S 32 P F 2 (ELE) F42LL 60 0.2 SW 500 120.0 4 S 32 P F 2 (ELE) F42LL 60 0.2 SW 500 \$0.00 \$0 | 18 | Child Study Office | 12 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.3 | SW | 2400 | 3,225.6 | 12 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.3 | 000 | 1200 | 1,612.8 | 1,612.8 | 0.0 | \$256.44 | \$128.25 | \$20.00 | 0.5 | 0.4 |
| 13 Girl's Bathroom 4 S 32 P F 2 (ELE) F42LL 60 0.2 SW 500 120.0 0.0 0.0 0.0 0.00 | 13 13 | Storage Boys Bathroom | 1 4 | S 32 P F 2 (ELE) S 32 P F 2 (ELE) | F42LL F42LL | 60 60 | 0.1 | SW SW | 1000 500 | 60.0 120.0 | <u> </u> | S 32 P F 2 (ELE) S 32 P F 2 (ELE) | F42LL F42LL | 60 60 | 0.1 | SW SW | 1000 500 | 60.0 120.0 | 0.0 | 0.0 | \$0.00 \$0.00 | \$0.00 \$0.00 | \$0.00 \$0.00 | | |
| 10 102 102 112 0.0 102 102 102 101 102 101 102 102 102 102 101 102 101 102 101 102 101 102 101 102 101 102 101 102 101 102 101 102 101 102 101 101 101 101 102 101 102 101 102 101 102 101 102 101 102 101 10 | 13 | Girl's Bathroom | 4 | S 32 P F 2 (ELE) | F42LL | 60 | 0.2 | SW | 500 | 120.0 | 4 | S 32 P F 2 (ELE) | F42LL | 60 | 0.2 | SW | 500 | 120.0 | 0.0 | 0.0 | \$0.00 \$89.75 | \$0.00 \$128.25 | \$0.00 | 1 / | 1 0 |
| 18 Room 118 K 13 T 32 R F 4 (ELE) F44IL 12 1.5 SW 2400 3,494.4 13 T 32 R F 4 (ELE) 16.68 \$128.5 \$20.0 18 Room 121 12 T 32 R F 4 (ELE) F44IL 12 1.3 SW 2400 3,256 12 T 32 R F 4 (ELE) 14 1.3 0.0 \$16.68 \$128.25 \$20.00 18 Halwap 5 15 T 32 R F 4 (ELE) F44IL 12 1.3 SW 2400 3,256 12 T 32 R F 4 (ELE) 64.0 2,57.9 96.7 0.0 \$153.86 \$128.25 \$20.00 18 Halwap 5 15 T 32 R F 4 (ELE) F44IL 112 1.7 SW 2280 3,83.4 15 T 32 R F 4 (ELE) 64.0 17.0 SW 28.00 \$0.00 < | 18 | Room 123 | 9 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.0 | SW | 2400 | 2,419.2 | 9 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.0 | 000 | 1680 | 1,693.4 | 725.8 | 0.0 | \$115.40 | \$128.25 | \$20.00 | 1.1 | 0.9 |
| 18 Hallway 5 15 T 32 R F 4 (ELE) F44IL 112 1.7 SW 2280 3,830.4 15 T 32 R F 4 (ELE) 6.00 \$0.00 | 18 18 | Room 118 K Room 121 | 13 | T 32 R F 4 (ELE) T 32 R F 4 (ELE) | F44ILL F44ILL | 112 112 | 1.5 1.3 | SW SW | 2400 2400 | 3,494.4 | 13 12 | T 32 R F 4 (ELE) T 32 R F 4 (ELE) | F44ILL F44ILL | 112 112 | 1.5 | 000 000 | 1680 1680 | 2,446.1 2,257.9 | 1,048.3 967.7 | 0.0 | \$166.68 \$153.86 | \$128.25 \$128.25 | \$20.00 \$20.00 | 0.8 0.8 | 0.6 |
| 10 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 13 12 13 12 13 12 13 <th13< th=""> 13 13 <th1< td=""><td>18 18</td><td>Hallway 5</td><td>15</td><td>T 32 R F 4 (ELE)</td><td>F44ILL F44II I</td><td>112</td><td>1.7</td><td>SW</td><td>2280</td><td>3,830.4 4 596 5</td><td>15</td><td>T 32 R F 4 (ELE) T 32 R F 4 (FLF)</td><td>F44ILL F44II I</td><td>112</td><td>1.7</td><td>SW SW/</td><td>2280 2280</td><td>3,830.4</td><td>0.0</td><td>0.0</td><td>\$0.00 \$0.00</td><td>\$0.00 \$0.00</td><td>\$0.00 \$0.00</td><td></td><td></td></th1<></th13<> | 18 18 | Hallway 5 | 15 | T 32 R F 4 (ELE) | F44ILL F44II I | 112 | 1.7 | SW | 2280 | 3,830.4 4 596 5 | 15 | T 32 R F 4 (ELE) T 32 R F 4 (FLF) | F44ILL F44II I | 112 | 1.7 | SW SW/ | 2280 2280 | 3,830.4 | 0.0 | 0.0 | \$0.00 \$0.00 | \$0.00 \$0.00 | \$0.00 \$0.00 | | |
| (100 - 100 | 18 | Room 120 | 12 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.3 | SW | 2400 | 3,225.6 | 12 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.3 | 000 | 1680 | 2,257.9 | 967.7 | 0.0 | \$153.86 | \$128.25 | \$20.00 | 0.8 | 0.7 |

Cost of Electricity: \$0.159 \$/kWh

\$6.22 \$/kW

Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735 ECM-8 Install Occupancy Sensors

Cost of Electricity: \$0.159 \$/kWh \$6.22 \$/kW

| | | | | EXISTING COND | ITIONS | | | | | | | RETROFIT | CONDITION | S | | | | | CO | ST & SAVIN | IGS ANALY | SIS | | |
|---------------|---|---|---|---|---|------------------------------|--------------------------------|---|--------------------------------|------------------------------------|---|--|---|---|-------------------------------|---|-----------------------------------|---|--|-----------------------------|--|--|--|---|
| | 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 kW Saved | h 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 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 0 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 Annu kWh) - (Retrol Annual kWh) | ial (Original Annua fit kW) - (Retrofit Annual kW) | il (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 |
| 18 | Room 119 | 12 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.3 | SW | 2400 | 3,225.6 | 12 | T 32 R F 4 (ELE) | F44ILL | 112 | 1.3 | OCC | 1680 | 2,257.9 | 967.7 | 0.0 | \$153.86 | \$128.25 | \$20.00 | 0.8 | 0.7 |
| 257 | Hallway | 11 | CF11W | CF11/2 | 26 | 0.3 | SW | 2280 | 652.1 | 11 | CF11W | CF11/2 | 26 | 0.3 | SW | 2280 | 652.1 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | | |
| 11 | Faculty Room | 5 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 2400 | 864.0 | 5 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | OCC | 1200 | 432.0 | 432.0 | 0.0 | \$68.69 | \$128.25 | \$20.00 | 1.9 | 1.6 |
| 11 | Men's Bathroom | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 500 | 36.0 | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 500 | 36.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | | |
| 11 | Women's Bathroom | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 500 | 36.0 | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 500 | 36.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | | |
| 8 | Exterior | 44 | MH 175 | MH175/1 | 215 | 9.5 | SW | 4368 | 41,321.3 | 44 | MH 175 | MH175/1 | 215 | 9.5 | SW | 4368 | 41,321.3 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | | |
| 73 | Exterior | 16 | I 120 | l120/1 | 120 | 1.9 | SW | 4368 | 8,386.6 | 16 | I 120 | l120/1 | 120 | 1.9 | SW | 4368 | 8,386.6 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | | |
| 93 | Exterior Shed | 5 | 175 | 175/1 | 75 | 0.4 | SW | 4368 | 1,638.0 | 5 | 175 | 175/1 | 75 | 0.4 | SW | 4368 | 1,638.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | | |
| 11 | Exterior Shed | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 4368 | 314.5 | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 4368 | 314.5 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | | |
| Т | otal | 778 | | | | 91.4 | | | 227,328 | 778 | | | | 91 | | | 182,473 | 44,855 | 0 | 7,132 | \$8,708 | 1,375 | | |
| | | | | | | | | | | | | | | | | | Demar | nd Savings | | 0.0 | \$0 | | | |
| | | | | | | | | | | | | | | | | | kWh | Savings | | 44,855 | \$7,132 | | | |
| | | | | | | | | | | | | | | | | | Tota | l Savings | | | \$7,132 | | 1.2 | 1.0 |

Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735 ECM-9 Lighting Replacements with Occupancy Sensors

| | | | | EXISTIN |
|----------------|---|---|---|-------------------------------------|
| | | | | |
| | Area Description | No. of Fixtures | Standard Fixture Code | Fixture Co |
| 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 Fixture Wattages |
| 11 11 | Doorway - 3 Old Hallway | 1 44 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | F42EE F42EE |
| 6 | Room 106 | 9 | T 34 R F 4 (MAG) | F44EE |
| <u>11</u> 6 | Room 106 Room 105 | 4 9 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44EE |
| 11 | Room 105 | 4 | S 34 P F 2 (MAG) | F42EE |
| 6 11 | Room104 Room 104 | 9 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE |
| 6 | Room 103 | 9 | T 34 R F 4 (MAG) | F44EE |
| <u>11</u> 6 | Room 103 Room 102 | 6 9 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE |
| 11 | Room 102 | 6 | S 34 P F 2 (MAG) | F42EE |
| 11 71 | Doorway - 4 North Custodial Closet | 1 | S 34 P F 2 (MAG) | F42EE |
| 11 | Boy's Bathroom | 4 | S 34 P F 2 (MAG) | F42EE |
| <u>11</u> 6 | Girl's Bathroom Room 101 | 4 9 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE F44EE |
| 11 | Room 101 | 6 | S 34 P F 2 (MAG) | F42EE |
| 6 11 | Library Library Server Room | 22 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE |
| 6 | Room 116 | 12 | T 34 R F 4 (MAG) | F44EE |
| <u>11</u> 6 | Room 116 Room 115 | 6 12 | S 34 P F 2 (MAG) T 34 R F 4 (MAG) | F42EE |
| 11 | Room 115 | 6 | S 34 P F 2 (MAG) | F42EE |
| 11 | Boiler Room - 1 Nurse | 6 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | |
| 78 | Nurse | 1 | EP I 100 | 1100/1 |
| 11 | Nurse | 1 4 | S 34 P F 2 (MAG) S 34 P F 2 (MAG) | |
| 71 | Nurse | 1 | I 60 | 160/1 |
| 6 11 | Room 122 Custodian Office | 2 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | |
| 6 | Room 114 | 2 | T 34 R F 4 (MAG) | F44EE |
| 6 6 | Superintendent Office Board of Education Room | 4 | T 34 R F 4 (MAG) T 34 R F 4 (MAG) | F44EE F44EE |
| 11 | Board of Education Room | 3 | S 34 P F 2 (MAG) | F42EE |
| 6 11 | Business Administrator Business Administrator | 4 3 | T 34 R F 4 (MAG) S 34 P F 2 (MAG) | F44EE F42EE |
| 6 | Room 113 | 9 | T 34 R F 4 (MAG) | F44EE |
| <u>11</u> 6 | Room 113 Room 112 | 6 9 | T 34 R F 4 (MAG) | F42EE F44EE |
| 11 | Room 112 | 6 | S 34 P F 2 (MAG) | F42EE |
| 8 11 | Kitchen | 18 | S 34 P F 2 (MAG) | F42EE |
| 71 | Walk-in Freezer | 1 | 160 | I60/1 |
| 6 | Room 111 | 9 | T 34 R F 4 (MAG) | F44EE |
| 11 | Room 111 | 6 | S 34 P F 2 (MAG) | F42EE |
| 0 11 | Room 112 | 9 6 | S 34 P F 2 (MAG) | F44EE F42EE |
| 6 | Room 110 | 9 | T 34 R F 4 (MAG) | F44EE |
| 6 | Room 109 | 9 | T 34 R F 4 (MAG) | F42EE |
| 11 | Room 109 | 6 | S 34 P F 2 (MAG) | F42EE |
| | Room 108 | 9 6 | S 34 P F 2 (MAG) | F44EE |
| 6 | Room 107 | 9 | T 34 R F 4 (MAG) | F44EE |
| 78 | Cafeteria | 18 | EP I 100 | I100/1 |
| 6 | Main Office Main Entrance | 10 | T 34 R F 4 (MAG) | F44EE |
| 35 | Room 117 | 6 | T 32 R F 3 (ELE) | F43ILL/2 |
| 35 | Room 118 | 6 | T 32 R F 3 (ELE) | F43ILL/2 |
| 13 | Storage Room | 3 | S 32 P F 2 (ELE) | F42LL |
| 13 35 | Faculty Bathroom | 1 | S 32 P F 2 (ELE) | F42LL |
| 13 | Boiler Room - 2 | 10 | S 32 P F 2 (ELE) | F42LL |
| 13 18 | Electrical Room | 2 | S 32 P F 2 (ELE) T 32 R F 4 (FLF) | F42LL F44ILI |
| 13 | Art Room Storage | 2 | S 32 P F 2 (ELE) | F42LL |
| 13 71 | Art Room Storage | 2 | S 32 P F 2 (ELE) 60 | F42LL |
| 9LED | Gymnasium | 40 | High Bay MH 200 35 Feet High | MH200/1 |
| 18 13 | Music Room Music Room Storage | 15 | T 32 R F 4 (ELE) | F44ILL F42LI |
| 257 | Hallway 6 | 8 | CF11W | CF11/2 |
| 18 18 | Room 124 Child Study Office | 8 12 | T 32 R F 4 (ELE) T 32 R F 4 (FLF) | F44ILL F44IL |
| 13 | Storage | 1 | S 32 P F 2 (ELE) | F441LL |
| 13 13 | Boys Bathroom Girl's Bathroom | 4 4 | S 32 P F 2 (ELE) S 32 P F 2 (FLF) | F42LL |
| 18 | Room 123 | 7 | T 32 R F 4 (ELE) | F44ILL |
| 18 18 | Room 122 | 9 | T 32 R F 4 (ELE) | F44ILL |
| 18 | Room 121 | 12 | T 32 R F 4 (ELE) | F44ILL |
| 18 18 | Hallway 5 | 15 | T 32 R F 4 (ELE) | F44ILL |
| 18 | Room 120 | 12 | T 32 R F 4 (ELE) | F44ILL |
| 18 257 | Room 119 | 12 | T 32 R F 4 (ELE) | F44ILL CF11/2 |

Cost of Electricity: \$0.159 \$/kWh \$6.22 \$/kW

TING CONDITIONS RETROFI Number of Exist Annual Watts per **Fixtures** Standard Fixture Code Fixture kW/Space Control Hours Annual kWh Fixture Cod e Code y (kW/space) * No. of fixtures "Lighting Fixture Code" Example Code from Table (Annual Hours) after the retrofit 2T 40 R F(U) = 2'x2' Troff 40 Standard Fixture able of Standard Value from (Watts/Fixt) * Estimated daily (kW/space) * Code from Table of Pre-inst. hours for the Table of (Fixt No.) control les w Recess. Floor 2 lamps U shape Wattages usage group Standard device Fixture Wattages SW SW SW F42SSILL 164 1 S 28 P F 2 0.1 2280 7,223 F42SSILL S 28 P F 2 3.2 2280 44 3,110 691 T 28 R F 4 F44SSILL 1.3 2400 9 F42SSILL SW 2400 S 28 P F 2 0.3 4 SW SW T 28 R F 4 F44SSILL 1.3 3,110 2400 144 9 S 28 P F 2 F42SSILL 0.3 691 2400 4 F44SSILL 3,110 T 28 R F 4 SW 1.3 2400 144 9 1,037 F42SSILL S 28 P F 2 SW 0.4 2400 6 F44SSILL F42SSILL SW 3,110 T 28 R F 4 1.3 2400 144 9 1,037 S 28 P F 2 SW SW 0.4 2400 6 3,110 T 28 R F 4 F44SSILL 1.3 2400 SW 1,037 164 60 F42SSILL S 28 P F 2 0.4 2400 6 SW S 28 P F 2 F42SSILL 0.1 2280 1 CFQ26/1-L SW CF 26 0.1 1000 1 144 SW S 28 P F 2 F42SSILL 0.3 500 4 SW 144 S 28 P F 2 F42SSILL 0.3 500 4 3,110 F44SSILL T 28 R F 4 SW 2400 1.3 9 144 1,037 S 28 P F 2 F42SSILL SW 0.4 2400 6 7,603 F44SSILL SW T 28 R F 4 3.2 2400 22 SW SW S 28 P F 2 F42SSILL 0.1 1000 144 4,147 T 28 R F 4 1.7 2400 F44SSILL 12 S 28 P F 2 F42SSILL SW 1,037 0.4 2400 6 T 28 R F 4 SW 4,147 F44SSILL 1.7 2400 12 144 SW 1,037 S 28 P F 2 F42SSILL 0.4 2400 6 432 F42SSILL SW S 28 P F 2 0.4 1000 6
 518

 240

 173

 691
 SW S 28 P F 2 F42SSILL 0.2 2400 CFQ26/1-L SW CF 26 0.1 2400 1 S 28 P F 2 F42SSILL SW SW 0.1 2400 1 F42SSILL S 28 P F 2 0.3 2400 4 SW 144 CFQ26/1-L CF 26 0.1 2400 1 691 T 28 R F 4 0.3 SW F44SSILL 2400 144 S 28 P F 2 0.2 SW 518 3 F42SSILL 72 2400 691 144 0.3 SW T 28 R F 4 F44SSILL 2400 SW 144 0.6 2400 1,382 4 T 28 R F 4 F44SSILL SW 144 0.6 1,382 T 28 R F 4 F44SSILL 2400 4 F42SSILL SW 518 S 28 P F 2 0.2 2400 SW T 28 R F 4 0.6 2400 1,382 F44SSILL 4 SW F42SSILL 0.2 2400 518 S 28 P F 2 3 SW 1.3 2400 3,110 T 28 R F 4 F44SSILL 144 9 1,037 S 28 P F 2 F42SSILL 0.4 SW 2400 6 3,110 F44SSILL SW T 28 R F 4 144 1.3 2400 9 1,037 SW S 28 P F 2 F42SSILL 0.4 2400 6 SW 6,192 FXLED39/1 3.9 75/1 1600 18 FXLED39 15 SW 1,728 1.1 1600 S 28 P F 2 F42SSILL SW CFQ26/1-L 0.1 1000 60 CF 26 1 CFQ26/1-L SW CF 26 0.1 1000 60 1 T 28 R F 4 F44SSILL SW 1.3 3,110 144 2400 9 SW 1,037 F42SSILL 0.4 2400 6 SW 144 1.3 2400 3,110 9 T 28 R F 4 F44SSILL 1,037 0.4 SW 2400 S 28 P F 2 F42SSILL 6 1.3 SW 3,110 T 28 R F 4 F44SSILL 144 2400 a SW 1,037 S 28 P F 2 F42SSILL 2400 0.4 6 SW 1.3 3,110 T 28 R F 4 F44SSILL 2400 9 SW 1,037 0.4 2400 S 28 P F 2 F42SSILL 6 F44SSILL 1.3 SW 2400 3,110 T 28 R F 4 144 9 1,037 S 28 P F 2 0.4 SW F42SSILL 2400 6 1.3 SW 2400 3,110 T 28 R F 4 F44SSILL 144 9 SW 1,037 0.4 2400 S 28 P F 2 F42SSILL 6 CFQ26/1-L SW 2,880 1.8 1600 18 CF 26 100 3,456 SW T 28 R F 4 F44SSILL 144 1.4 2400 10 CF11/2 SW CF11W 0.3 593 10 2280 SW T 32 R F 3 (ELE) F43ILL/2 0.5 1,296 2400 6 F43ILL/2 LL/2 SW 0.5 2400 1,296 T 32 R F 3 (ELE) 6 ILL/2 0.8 SW 1,944 T 32 R F 3 (ELE) F43ILL/2 2400 9 SW 180 F42SSILL 0.2 1000 S 28 P F 2 211 60 3 F42SSILL SW 30 S 28 P F 2 0.1 500 SW 1,080 T 32 R F 3 (ELE) F43ILL/2 0.5 L/22400 5 F42SSILL SW 600 0.6 1000 10 S 28 P F 2 0.1 SW 1000 120 S 28 P F 2 F42SSILL SW T 28 R F 4 F44SSILL 1.7 4,032 2400 15 F42SSILL SW 0.1 S 28 P F 2 1000 120 2 F42SSILL SW S 28 P F 2 0.1 1000 120 2 SW 864 CFQ26/1-L 0/1 60 0.4 2400 6 CF 26 SW 18,560 FXLED78 200/1 232 9.3 2000 40 FXLED78/1 112 1.7 SW 2400 4,032 15 T 28 R F 4 F44SSILL 0.1 SW 1000 120 S 28 P F 2 F42SSILL SW 474 CF11W CF11/2 0.2 2280 8 SW T 28 R F 4 F44SSILL 0.9 2,150 2400 8 SW F44SSILL 1.3 3,226 T 28 R F 4 2400 12 S 28 P F 2 F42SSILL 0.1 SW 1000 60 1

120

1,882

2,419

3,494

3,226

3,830

4,596

3,226

120 4

4

7

13

12

15

18

12 3,226 12 T 28 R F 4

652 11 CF11W

g

500

500

2400

2400

2400

2400

2280

2280

2400

2400

2280

S 28 P F 2

S 28 P F 2

T 28 R F 4

F42SSILL

F42SSILL

F44SSILL

F44SSILL

F44SSILL

F44SSILL

F44SSILL

F44SSILL

F44SSILL

F44SSILL

CF11/2

0.2

0.2

0.8

1.0

1.5

1.3

1.7

2.0

13

1.3

0.3

60

112

112

112

SW

| CC | ONDITIONS | | | | | | CC | OST & SAVIN | IGS ANALYS | S | | |
|----|---|---|-------------------------------|---|-----------------------------------|---|---|---|--|--|--|---|
| e | Watts per Fixture | kW/Space | Retrofit | 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 |
| of | 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 |
| | 48 | 0.0 | SW | 2,280 | 109 | 55 | 0.0 | \$ 10.49 \$ 461.64 | \$ 114.75 \$ 5.040.00 | \$ 10 \$ 140 | 10.9 | 10.0 |
| | 48 96 | 2.1 0.9 | OCC | 2,280 | 4,815 | 2,408 | 1.1 0.4 | \$ 461.64 \$ 296.01 | \$ 5,049.00 \$ 1.404.00 | \$ 440 \$ 110 | 10.9 4.7 | 10.0 |
| | 48 | 0.2 | 000 | 1,680 | 323 | 369 | 0.1 | \$ 65.78 | \$ 587.25 | \$ 60 | 8.9 | 8.0 |
| | 96 | 0.9 | 000 | 1,680 | 1,452 | 1,659 | 0.4 | \$ 296.01 \$ 65.78 | \$ 1,404.00 \$ 587.25 | \$ 110 \$ 60 | 4.7 | 4.4 |
| | 96 | 0.9 | 000 | 1,680 | 1,452 | 1,659 | 0.4 | \$ 296.01 | \$ 1,404.00 | \$ 110 | 4.7 | 4.4 |
| | 48 | 0.3 | 000 | 1,680 | 484 | 553 | 0.1 | \$ 98.67 | \$ 816.75 | \$ 80 | 8.3 | 7.5 |
| | 96 | 0.9 | 000 | 1,680 | 1,452 | 1,659 | 0.4 | \$ 296.01 \$ 98.67 | \$ 1,404.00 \$ 816.75 | \$ 110 \$ 80 | 4.7 | 4.4 |
| | 96 | 0.9 | 000 | 1,680 | 1,452 | 1,659 | 0.4 | \$ 296.01 | \$ 1,404.00 | \$ 110 | 4.7 | 4.4 |
| | 48 | 0.3 | | 1,680 | 484 | 553 | 0.1 | \$ 98.67 \$ 10.40 | \$ 816.75 * 414.75 | \$ 80 | 8.3 | 7.5 |
| | 48 | 0.0 | SW | 2,280 | 27 | 33 | 0.0 | \$ 10.49 \$ 7.71 | \$ 114.75 \$ 6.75 | \$ 10 \$ - | 0.9 | 0.9 |
| | 48 | 0.2 | SW | 500 | 96 | 48 | 0.1 | \$ 14.80 | \$ 459.00 | \$ 40 | 31.0 | 28.3 |
| | 48 | 0.2 | SW | 500 | 96 | 48 | 0.1 | \$ 14.80 \$ 206.01 | \$ 459.00 | \$ 40 \$ 110 | 31.0 | 28.3 |
| | 48 | 0.3 | 000 | 1,680 | 484 | 553 | 0.4 | \$ <u>298.01</u> \$ 98.67 | \$ 1,404.00 \$ 816.75 | \$ 110 | 8.3 | 7.5 |
| | 96 | 2.1 | C-0CC | 1,680 | 3,548 | 4,055 | 1.1 | \$ 723.57 | \$ 3,321.00 | \$ 255 | 4.6 | 4.2 |
| | 48 | 0.1 | SW | 1,000 | 96 | 48 | 0.0 | \$ 11.21 \$ 394.68 | \$ 229.50 \$ 1 829 25 | \$ 20 \$ 140 | 20.5 4.6 | <u> </u> |
| | 48 | 0.3 | 000 | 1,680 | 484 | 553 | 0.1 | \$ 98.67 | \$ 816.75 | \$ 80 | 8.3 | 7.5 |
| | 96 | 1.2 | 000 | 1,680 | 1,935 | 2,212 | 0.6 | \$ 394.68 | \$ 1,829.25 | \$ 140 | 4.6 | 4.3 |
| | 48 | 0.3 | SW | 1,680 | 288 | 144 | 0.1 | \$ 98.67 \$ 33.64 | \$ 688.50 | \$ 80 \$ 60 | 20.5 | 7.5 18.7 |
| | 48 | 0.1 | 000 | 1,200 | 173 | 346 | 0.1 | \$ 60.32 | \$ 472.50 | \$ 50 | 7.8 | 7.0 |
| | 27 | 0.0 | 000 | 1,200 | 32 58 | 208 | 0.1 | \$ <u>38.46</u> \$ <u>20.11</u> | \$ 148.50 \$ 243.00 | \$ 20 \$ 30 | 3.9 | 3.3 |
| | 48 | 0.2 | 000 | 1,200 | 230 | 461 | 0.1 | \$ 80.43 | \$ 587.25 | \$ 60 | 7.3 | 6.6 |
| | 27 | 0.0 | 000 | 1,200 | 32 | 112 | 0.0 | \$ 20.21 | \$ 135.00 | \$ 20 | 6.7 | 5.7 |
| | 96 48 | 0.2 | OCC SW | 1,680 2 400 | 323 346 | 369 | 0.1 | \$ 65.78 \$ 32.85 | \$ 411.75 \$ 344.25 | \$ 40 \$ 30 | 6.3 10.5 | 5.7 |
| | 96 | 0.2 | 000 | 1,680 | 323 | 369 | 0.1 | \$ 65.78 | \$ 411.75 | \$ 40 | 6.3 | 5.7 |
| | 96 | 0.4 | 000 | 1,200 | 461 | 922 | 0.2 | \$ 160.87 \$ 160.87 | \$ 695.25 \$ 605.25 | \$ 60 \$ 60 | 4.3 | 3.9 |
| | 48 | 0.4 | 000 | 1,200 | 173 | 346 | 0.2 | \$ 60.32 | \$ 695.25 \$ 472.50 | \$ 50 \$ 50 | 7.8 | 7.0 |
| | 96 | 0.4 | 000 | 1,200 | 461 | 922 | 0.2 | \$ 160.87 | \$ 695.25 | \$ 60 | 4.3 | 3.9 |
| | 48 | 0.1 | 000 000 | 1,200 | 173 | 346 | 0.1 | \$ 60.32 \$ 296.01 | \$ 472.50 \$ 1 404 00 | \$ 50 \$ 110 | 7.8 | 7.0 |
| | 42 | 0.3 | 000 | 1,680 | 423 | 613 | 0.2 | \$ 110.97 | \$ 816.75 | \$ 80 | 7.4 | 6.6 |
| | 96 | 0.9 | 000 | 1,680 | 1,452 | 1,659 | 0.4 | \$ 296.01 \$ 08.67 | \$ 1,404.00 \$ 916.75 | \$ 110 \$ 80 | 4.7 | 4.4 |
| | 39 | 0.3 | 000 | 1,000 | 842 | 5,350 | 3.2 | \$ 1,087.05 | \$ 8,829.00 | ^φ 00 \$ 1,835 | 8.1 | 6.4 |
| | 48 | 0.7 | SW | 1,600 | 1,152 | 576 | 0.4 | \$ 118.45 | \$ 1,721.25 | \$ 150 | 14.5 | 13.3 |
| | 27 27 | 0.0 | SW SW | 1,000 | 27 | 33 | 0.0 | \$ 7.71 \$ 7.71 | \$ 6.75 \$ 6.75 | \$- \$- | 0.9 | 0.9 |
| | 96 | 0.9 | 000 | 1,680 | 1,452 | 1,659 | 0.4 | \$ 296.01 | \$ 1,404.00 | \$ 110 | 4.7 | 4.4 |
| | 42 | 0.3 | 000 | 1,680 | 423 | 613 | 0.2 | \$ 110.97 \$ 206.01 | \$ 816.75 \$ 1 404 00 | \$ 80 \$ 110 | 7.4 | 6.6 |
| | 48 | 0.9 | 000 | 1,680 | 484 | 553 | 0.4 | \$ <u>296.01</u> \$ <u>98.67</u> | \$ 1,404.00 \$ 816.75 | \$ 110 \$ 80 | 8.3 | 7.5 |
| | 96 | 0.9 | 000 | 1,680 | 1,452 | 1,659 | 0.4 | \$ 296.01 | \$ 1,404.00 | \$ 110 | 4.7 | 4.4 |
| | 48 | 0.3 | 220 | 1,680 | 484 | <u>553</u> 1 659 | 0.1 | \$ 98.67 \$ 296.01 | \$ 816.75 \$ 1 404 00 | \$ 80 \$ 110 | 8.3 4 7 | 7.5 |
| | 48 | 0.3 | 000 | 1,680 | 484 | 553 | 0.1 | \$ 98.67 | \$ 816.75 | \$ 80 | 8.3 | 7.5 |
| | 96 | 0.9 | 000 | 1,680 | 1,452 | 1,659 | 0.4 | \$ 296.01 \$ 08.67 | \$ 1,404.00 \$ 916.75 | \$ 110 \$ 80 | 4.7 | 4.4 |
| | 48 96 | 0.3 | 000 | 1,680 | 404 1,452 | 1,659 | 0.1 | \$ <u>98.07</u> \$ 296.01 | \$ 1,404.00 | \$ 00 \$ 110 | 4.7 | 4.4 |
| | 48 | 0.3 | 000 | 1,680 | 484 | 553 | 0.1 | \$ 98.67 | \$ 816.75 | \$ 80 | 8.3 | 7.5 |
| | <u> </u> | 0.5 | 000-0 000 | 1,200 | 583 | 2,297 | 1.3 0.5 | \$ 463.27 \$ 402.16 | \$ 567.00 \$ 1.545.75 | \$ 35 \$ 120 | 1.2 3.8 | 1.1 |
| | 26 | 0.3 | SW | 2,280 | 593 | - | 0.0 | \$ - | \$ - | \$ - | | |
| | 90 | 0.5 | 000 | 1,680 | 907 907 | 389 | 0.0 | \$ 61.82 \$ 61.82 | \$ 128.25 \$ 128.25 | \$ 20 \$ 20 | 2.1 | 1.8 |
| | 90 | 0.8 | 0000 | 1,680 | 1,361 | 583 | 0.0 | \$ 92.73 | \$ 202.50 | \$ <u>20</u> \$35 | 2.1 | 1.8 |
| | 48 | 0.1 | SW | 1,000 | 144 | 36 | 0.0 | \$ 8.41 | \$ 344.25 | \$ 30 | 40.9 | 37.4 |
| | <u>48</u> 90 | 0.0 | OCC | 1.200 | 540 | 6 540 | 0.0 | \$ 1.85 \$ 85.86 | \$ 114.75 \$ 128.25 | \$ 10 \$ 20 | 62.0 1.5 | 56.6 1.3 |
| | 48 | 0.5 | SW | 1,000 | 480 | 120 | 0.1 | \$ 28.04 | \$ 1,147.50 | \$ 100 | 40.9 | 37.4 |
| | 48 | 0.1 | SW | 1,000 | 96 2 4 1 9 | 24 | 0.0 | \$ 5.61 \$ 274.35 | \$ 229.50 \$ 1.849.50 | \$ 20 \$ 170 | 40.9 6.7 | 37.4 6.1 |
| | 48 | 0.1 | SW | 1,000 | 96 | 24 | 0.0 | \$ 5.61 | \$ 229.50 | \$ 20 | 40.9 | 37.4 |
| | 48 | 0.1 | SW | 1,000 | 96 | 24 | 0.0 | \$ 5.61 \$ 108.88 | \$ 229.50 \$ 168.75 | \$ 20 \$ 20 | 40.9 | 37.4 |
| | 78 | 3.1 | 000 | 1,800 | 5,616 | 12,944 | 6.2 | \$ 2,517.88 | \$ 39,391.50 | φ 20 \$ 6,035 | 15.6 | 13.2 |
| | 96 | 1.4 | 000 | 1,680 | 2,419 | 1,613 | 0.2 | \$ 274.35 | \$ 1,849.50 | \$ 170 | 6.7 | 6.1 |
| | 48 | 0.1 | SW SW | 1,000 | 96 474 | - 24 | 0.0 | \$ | \$ | <u>\$</u> 20 \$- | 40.9 | 37.4 |
| | 96 | 0.8 | 000 | 1,680 | 1,290 | 860 | 0.1 | \$ 146.32 | \$ 1,046.25 | \$ 100 | 7.2 | 6.5 |
| | 96 | 1.2 | | 1,200 | 1,382 | 1,843 | 0.2 | \$ 307.40 | \$ 1,505.25 \$ 114.75 | \$ 140 \$ 10 | 4.9 | 4.4 |
| | 40 | 0.0 | SW | 500 | <u>48</u> 96 | 24 | 0.0 | ψ 2.80 \$ 7.40 | \$ 114.75 \$ 459.00 | \$ 10 | 62.0 | 56.6 |
| | 48 | 0.2 | SW | 500 | 96 | 24 | 0.0 | \$ 7.40 | \$ 459.00 | \$ 40 | 62.0 | 56.6 |
| | 96 96 | 0.7 0.9 | 000 | 1,680 | 1,129 1,452 | 968 968 | 0.1 0.1 | \$ 128.03 \$ 164.61 | > 931.50 \$ 1.161.00 | ⇒ 90 \$ 110 | 7.3 7.1 | <u>6.6</u> 6.4 |
| | 96 | 1.2 | 000 | 1,680 | 2,097 | 1,398 | 0.2 | \$ 237.77 | \$ 1,620.00 | \$ 150 | 6.8 | 6.2 |
| | 96 96 | 1.2 1 <i>Δ</i> | OCC SW/ | 1,680 2 280 | 1,935 | 1,290 547 | 0.2 | \$ 219.48 \$ 104.92 | \$ 1,505.25 \$ 1,721.25 | \$ 140 \$ 150 | 6.9 16 4 | 6.2 15.0 |
| | 96 | 1.7 | SW | 2,280 | 3,940 | 657 | 0.3 | \$ 125.90 | \$ 2,065.50 | \$ 180 | 16.4 | 15.0 |
| | 96 | 1.2 | 000 | 1,680 | 1,935 | 1,290 | 0.2 | \$ 219.48 \$ 210.49 | \$ 1,505.25 \$ 1,505.25 | \$ 140 \$ 140 | 6.9 | 6.2 |
| | 26 | 0.3 | SW | 2,280 | 652 | - 1,290 | 0.2 | φ 219.48 \$- | φ 1,505.25 \$- | φ 140 \$ - | 0.9 | 0.2 |

Energy Audit of NJBPU - Bethlehem - Thomas Conley Elementary School CHA Project No. 24735 ECM-9 Lighting Replacements with Occupancy Sensors

| | | | | EXISTING CON | DITIONS | | | | | | | RETROFIT C | ONDITION | IS | | | | | C | OST & SAVI | <mark>NGS ANALYS</mark> | IS | | |
|---------------|--|--|---|---|---|------------------------------|--------------------------------|---|--------------------------------|----------------------------------|---|--|---|---|-------------------------------|---|-----------------------------------|---|--|--------------------------------|---|--------------------------------------|--|---|
| | | No. of | | | Watts per | | Exist | Annual | | Number o | F | | Watts per | r | Retrofit | Annual | Annual | Annual kWI | h Annual kV | V Annual \$ | | NJ Smart Start Lighting | Simple Payback With Out | Simple |
| | Area Description | Fixtures | Standard Fixture Code | Fixture Code | Fixture | kW/Space | Control | Hours | Annual kWh | Fixtures | Standard Fixture Code | Fixture Code | Fixture | kW/Space | Control | Hours | kWh | Saved | Saved | Saved | Retrofit Cost | Incentive | Incentive | Payback |
| Field Code | Unique description of the location - Room number/Roo name: Floor number (if applicable) | om 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 | d 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 retrof | "Lighting Fixture Code" Example t 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 Annua kWh) - (Retrofi Annual kWh) | al (Original Annu it kW) - (Retrofi Annual kW) | al (kWh Saved) * t (\$/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 |
| 11 | Faculty Room | 5 | S 34 P F 2 (MAG) | F42EE | 72 | 0.4 | SW | 2400 | 864 | 5 | S 28 P F 2 | F42SSILL | 48 | 0.2 | OCC | 1,200 | 288 | 576 | 6 0.1 | \$ 100.54 | \$ 702.00 | \$ 70 |) 7.0 | 6.3 |
| 11 | Men's Bathroom | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 500 | 36 | 1 | S 28 P F 2 | F42SSILL | 48 | 0.0 | SW | 500 | 24 | 12 | 2 0.0 | \$ 3.70 |) \$ 114.75 | \$ 10 |) 31.0 | 28.3 |
| 11 | Women's Bathroom | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 500 | 36 | 1 | S 28 P F 2 | F42SSILL | 48 | 0.0 | SW | 500 | 24 | 12 | 2 0.0 | \$ 3.70 |) \$ 114.75 | \$ 10 |) 31.0 | 28.3 |
| 8 | Exterior | 44 | MH 175 | MH175/1 | 215 | 9.5 | SW | 4368 | 41,321 | 44 | FXLED39 | FXLED39/1 | 39 | 1.7 | SW | 4,368 | 7,495 | 33,826 | 6 7.7 | \$ 5,956.32 | \$ 21,087.00 | \$ 4,400 |) 3.5 | 2.8 |
| 73 | Exterior | 16 | I 120 | l120/1 | 120 | 1.9 | SW | 4368 | 8,387 | 16 | CF 26 | CFQ26/1-L | 27 | 0.4 | SW | 4,368 | 1,887 | 6,500 | 0 1.5 | \$ 1,144.50 | \$ 108.00 | \$ | - 0.1 | 0.1 |
| 93 | Exterior Shed | 5 | l 75 | 175/1 | 75 | 0.4 | SW | 4368 | 1,638 | 5 | CF 26 | CFQ26/1-L | 27 | 0.1 | SW | 4,368 | 590 | 1,048 | 8 0.2 | \$ 184.60 | \$ 27.00 | \$ | - 0.1 | 0.1 |
| 11 | Exterior Shed | 1 | S 34 P F 2 (MAG) | F42EE | 72 | 0.1 | SW | 4368 | 314 | 1 | S 28 P F 2 | F42SSILL | 48 | 0.0 | SW | 4,368 | 210 | 105 | 5 0.0 | \$ 18.46 | \$ 114.75 | \$ 10 |) 6.2 | 5.7 |
| | Total | 778 | | | | 91.4 | | | 227,328 | 778 | | | | 53.9 | | | 96,033 | | 37.5 | 23,674 | 149,066 | \$19,285 | | |
| | | | | | | | | | | | | | | | | | Dema | nd Savings | | 37.5 | \$2,798 | | | |
| | | | | | | | | | | | | | | | | | kWł | Savings | | 131,295 | \$20,876 | | | |
| | | | | | | | | | | | | | | | | | Tota | I Savings | | | \$23,674 | | 6.3 | 5.5 |

Cost of Electricity: \$0.159 \$/kWh

APPENDIX D

New Jersey Pay For Performance Incentive Program

About Us | Press Room | Library | FAQs | Calendar | Newsletters | (

RENEWABL

Program

Large Scale CHI

Program Annour 2012 Large Ene

Announcement

Economic Devel

Introduces Revo

Pay for Performa

Incentives Now .

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Other updates pos

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HOME

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

EXISTING BUILDINGS

PARTICIPATION STEPS

APPLICATIONS AND FORMS

APPROVED PARTNERS

NEW CONSTRUCTION

FAQS

BECOME A PARTNER

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PILOT

ENERGY SAVINGS IMPROVEMENT PLAN

DIRECT INSTALL

ARRA

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

TEACH

EDA PROGRAMS

TECHNOLOGIES

TOOLS AND RESOURCES

PROGRAM UPDATES

Home » Commercial & Industrial » Programs » Pay for Performance

RESIDENTIAL

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

Take a comprehensive, whole-building approach to saving energy in your existing facilities and eam incentives that are directly linked to your savings. Pay for Performance relies on a network of

program partners who provide technical services under direct contract to you. Acting as your energy expert, your partner will develop an energy reduction plan for each project with a whole-building technical component of a traditional energy audit, a financial plan for funding the energy efficient measures and a construction schedule for installation.

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

Eligibility

Existing commercial, industrial and institutional buildings with a peak demand over 100 kW for any of the preceding twelve months are eligible to participate including hotels and casinos, large office buildings, multifamily buildings, supermarkets, manufacturing facilities, schools, shopping malls and restaurants. Buildings that fall into the following five customer classes are not required to meet the 100 kW demand in order

to participate in the program: hospitals, public colleges and universities, 501(c)(3) non-profits, affordable multifamily housing, and local governmental entities. Your energy reduction plan must define a comprehensive package of measures capable of reducing the existing energy consumption of your building by 15% or more.

Exceptions to the 15% threshold requirement may be made for certain industrial, manufacturing, water treatment and datacenter building types whose annual energy consumption is heavily weighted on process loads. Details are available in the high energy intensity section of the FAQ page.

ENERGY STAR Portfolio Manager

Pay for Performance takes advantage of the ENERGY STAR Program with Portfolio Manager, EPA's interactive tool that allows facility managers to track and evaluate energy and water consumption across all of their buildings. The tool provides the opportunity to load in the characteristics and energy usage of your buildings and determine an energy performance benchmark score. You can then assess energy management goals over time, identify strategic

opportunities for savings, and receive EPA recognition for superior energy performance.

This rating system assesses building performance by tracking and scoring energy use in your facilities and comparing it to similar buildings. That can be a big help in locating opportunities for cost-justified energy efficiency upgrades. And, based on our findings, you may be invited to participate in the Building Performance with ENERGY STAR initiative and receive special recognition as an industry leader in energy efficiency.

Incentives

Pay for Performance incentives are awarded upon the satisfactory completion of three program milestones:

Incentive #1 - Submittal of complete energy reduction plan prepared by an approved program partner - Contingent on moving forward, incentives will be between \$5,000 and \$50,000 based on approximately \$.10 per square foot, not to exceed 50% of the facility's

annual energy expense. Incentive #2 - Installation of recommended measures -Incentives are based on the projected level of electricity and natural gas savings resulting from the installation of comprehensive energy-efficiency measures. Incentive #3 - Completion of Post-Construction Benchmarking Report - A completed report verifying



implementation results. Incentives for electricity and natural gas savings will be paid based on actual savings, provided that the minimum performance threshold of 15% savings has been achieved







Follow Us:

energy reductions based on one year of post-



CONTACT US

A detailed Incentive Structure document is available on the applications and forms page.

Energy Efficiency Revolving Loan Fund (EE RLF)

New Jersey-based commercial, institutional or industrial entities (including 501(c)(3) organizations) that have received an approved energy reduction plan under Pay for Performance may be eligible for supplemental financing through the EE RLF. The financing, in the form of low-interest loans, can be used to support up to 80% of total eligible project costs, not to exceed \$2.5 million or 100% of total eligible project costs from all public state funding sources. Visit the NJ EDA website for details.

Steps to Participation

Click here for a step-by-step description of the program.

Home | Residential | Commercial & Industrial | Renewable Energy About Us | Press Room | Library | FAQs | Calendar | Newsletters | Contact Us | Site Map






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% |
|---------|-------------|------------|--------------|
| | | C - | e Incontinoe |

| Electric Incentives | Gas Incentives |
|---|--|
| Base Incentive based on 15% savings:\$0.09 per projected kWh saved For each % over 15% add:\$0.005 per projected kWh saved | Base Incentive based on 15% savings:\$0.90 per projected Therm saved For each % over 15% add: |
| Maximum Incentive: | Maximum Incentive: |
| Incentive Cap: | |

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 | Gas 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 | 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: | | | | |

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.

Bethlehem Township School District - NJBPU CHA Project # 24735 Thomas B. Conley Elementary School

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) | 59,584 |
|--------------------------------------|--------|
| Is this audit funded by NJ BPU (Y/N) | Yes |

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

Board of Public Utilites (BPU)

| | Annual Utilities | | |
|-------------------------------|------------------|--------|--|
| | kWh | Therms | |
| Existing Cost (from utility) | \$100,452 | | |
| Existing Usage (from utility) | 631,931 | | |
| Proposed Savings | 210,779 | | |
| Existing Total MMBtus | 2,157 | | |
| Proposed Savings MMBtus | 719 | | |
| % Energy Reduction | 33.4% | | |
| Proposed Annual Savings | \$49,800 | | |

| | Min (Savings = 15%) | | Increase (Savings > 15%) | | Max Incentive | | Achi | eved |
|--------------|---------------------|----------|--------------------------|----------|---------------|----------|--------|----------|
| | \$/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 Therms Total | | |
| Incentive #1 | \$0 | \$0 | \$5,958 |
| Incentive #2 | \$23,186 | \$0 | \$23,186 |
| Incentive #3 | \$23,186 | \$0 | \$23,186 |
| Total All Incentives | \$46,371 | \$0 | \$52,330 |

| Total Project Cost | \$481,294 |
|--------------------|-----------|
|--------------------|-----------|

| | | Allowable Incentive | |
|-----------------------------------|-----------|------------------------|--|
| % Incentives #1 of Utility Cost* | 5.9% | \$5,958 | |
| % Incentives #2 of Project Cost** | 4.8% | \$23,186 | |
| % Incentives #3 of Project Cost** | 4.8% | \$23,186 | |
| Total Eligible Incentives*** | \$52,330 | | |
| Project Cost w/ Incentives | \$428,964 | | |

| Project Payback (years) | | |
|-------------------------|----------|----|
| w/o Incentives | Incentiv | es |
| 9.7 | 8.6 | |

* 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

APPENDIX E

Energy Savings Improvement Plan (ESIP)



C A

Your Power to Save

At Home, for Business, and for the Future

| номе | RESIDENTIAL | COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT | RENEWABLE ENERGY |
|------------------------------------|--|--|---|
| | Llong » Commercial & Industrial » Dragrama | | Program Updates |
| BPU (| Energy Savings Improveme | nt Plan | Board Order - Standby Charges for Distributed Generation Customers |
| | A new State law allows government agencies to facilities and pay for the costs using the value of improvements. Under the recently enacted Chap Savings Improvement Program" (ESIP), provides | make energy related improvements to their energy savings that result from the ter 4 of the Laws of 2009 (the law), the "Energy all government agencies in New Jersey with a | T-12 Schools Lighting Replacement Initiative - Funding Allocation Reached Other updates posted |
| ID LOCAL GOVERNMENT | flexible tool to improve and reduce energy usage resources. | with minimal expenditure of new financial | |
| PROGRAMS | This Local Finance Notice outlines how local gov for their facilities. Below are two sample RFPs: | vernments can develop and implement an ESIP | Featured Success Story |
| PAY FOR PERFORMANCE | Local Government School Districts (K-12) | | Rutgers |
| | The Board also adopted protocols to measure en | nergy savings. | University |
| FUEL CELLS | The ESIP approach may not be appropriate for a | Ill energy conservation and energy efficiency | Oniversity. |
| LOCAL GOVERNMENT ENERGY | improvements. Local units should carefully cons best meets their needs. Local units considering Finance Notice, the law, and consult with qualifie approach the task. | Ider all alternatives to develop an approach that an ESIP should carefully review the Local ad professionals to determine how they should | Continued Commitment to |
| LARGE ENERGY USERS PILOT | FIRST STEP - ENERGY AUDI | т | Suving Energy |
| ENERGY SAVINGS IMPROVEMENT PLAN | For local governments interested in pursuing an As explained in the Local Finance Notice, this m | ESIP, the first step is to perform an energy audit. ay be done internally if an agency has qualified | Applications |
| DIRECT INSTALL | staff to conduct the audit. If not, the audit must b not by the energy savings company producing th | e implemented by an independent contractor and e Energy Reduction Plan. | and Brochures |
| ENERGY BENCHMARKING | Pursuing a Local Government Energy Audit throuvaluable first step to the ESIP approach - and it's | ugh New Jersey's Clean Energy Program is a s free. Incentives provide 100% of the cost of | program materials. |
| T-12 SCHOOLS LIGHTING | the audit. | | @ |
| | ENERGY REDUCTION PLANS | | SIGN IID TODAY |
| ELECTRIC CUSTOMERS | If you have an ESIP plan you would like to subm to ESIP@bpu.state.nj.us. Please limit the file size | it to the Board of Public Utilities, please email it ze to 3MB (or break it into smaller files). | |
| EDA PROGRAMS | Frankford Township School District | Like Cohool | |
| TEACH | Northern Hunterdon-Voornees Regiona Manalapan Township (180 MB - Right (| Click, Save As) | Follow Us: |
| ARRA | | | |
| TECHNOLOGIES | | | |
| TOOLS AND RESOURCES | | | |
| PROGRAM UPDATES | | | |
| CONTACT US | | | |
| | Home Residential Commercial * | Industrial Danaurable Energy | |

Home | Residential | Commercial & Industrial | Renewable Energy About Us | Press Room | Library | FAQs | Calendar | Newsletters | Contact Us | Site Map APPENDIX F

Photovoltaic (PV) Rooftop Solar Power Generation

Bethlehem Township Board of Education Thomas Conley Elementary School

| Cost of Electricity | \$0.159 | /kWh |
|---------------------|---------|--------|
| Electricity Usage | 631,931 | kWh/yr |
| System Unit Cost | \$4,000 | /kW |

Photovoltaic (PV) Solar Power Generation - Screening Assessment

| Budgetary | Annual Utility Savings | | | Estimated | Total | Federal Tax | New Jersey Renewable | Payback (without | Payback (with | |
|-----------|------------------------|---------|--------|-------------|---------|-------------|-------------------------|---------------------|------------------|-------|
| Cost | | | | Maintenance | Savings | Credit | ** SREC | incentive) | incentive) | |
| | | | | | Savings | | | | | |
| \$ | kW | kWh | therms | \$ | \$ | \$ | \$ | \$ | Years | Years |
| \$360,000 | 90.0 | 115,188 | 0 | \$18,310 | 0 | \$18,310 | \$0 | \$7,487 | 19.7 | 14.0 |

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= \$65 /1000kwh

Area Output*





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

12,472 ft2

Approximate System Size:

Is the roof flat? (Yes/No) Yes





90 kW Enter into PV Watts

| PV Watts Inputs* | | Enter into PV Watts (always 20 if flat, if |
|-------------------------|-------|--|
| Array Tilt Angle | 20 | pitched - enter estimated roof angle) |
| Array Azimuth | 180 | Enter into PV Watts (default) |
| Zip Code | 08802 | Enter into PV Watts |
| DC/AC Derate Factor | 0.83 | Enter info PV Watts |

PV Watts Output

115,188 annual kWh calculated in PV Watts program

% Offset Calc

Usage PV Generation % offset 631,931 (from utilities) 115,188 (generated using PV Watts) 18%

* http://www.freemaptools.com/area-calculator.htm **http://www.flettexchange.com http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html PVWATTS: AC Energy and Cost Savings







(Type comments here to appear on printout; maximum 1 row of 80 characters.)

*

| Station Identification | | | | | |
|--------------------------|--------------|--|--|--|--|
| City: | Allentown | | | | |
| State: | Pennsylvania | | | | |
| Latitude: | 40.65° N | | | | |
| Longitude: | 75.43° W | | | | |
| Elevation: | 117 m | | | | |
| PV System Specifications | | | | | |
| DC Rating: | 90.0 kW | | | | |
| DC to AC Derate Factor: | 0.830 | | | | |
| AC Rating: | 74.7 kW | | | | |
| Array Type: | Fixed Tilt | | | | |
| Array Tilt: | 40.7° | | | | |
| Array Azimuth: | 180.0° | | | | |
| Energy Specifications | | | | | |
| Cost of Electricity: | 15.9 ¢/kWh | | | | |

| Results | | | | | | |
|---------|---|-----------------------|-------------------------|--|--|--|
| Month | Solar Radiation (kWh/m ² /day) | AC Energy (kWh) | Energy Value (\$) | | | |
| 1 | 3.22 | 7788 | 1238.29 | | | |
| 2 | 3.84 | 8337 | 1325.58 | | | |
| 3 | 4.71 | 10967 | 1743.75 | | | |
| 4 | 5.25 | 11365 | 1807.03 | | | |
| 5 | 5.24 | 11129 | 1769.51 | | | |
| 6 | 5.25 | 10631 | 1690.33 | | | |
| 7 | 5.57 | 11465 | 1822.93 | | | |
| 8 | 5.23 | 10784 | 1714.66 | | | |
| 9 | 4.85 | 9985 | 1587.61 | | | |
| 10 | 4.37 | 9641 | 1532.92 | | | |
| 11 | 2.92 | 6466 | 1028.09 | | | |
| 12 | 2.81 | 6628 | 1053.85 | | | |
| Year | 4.44 | 115188 | 18314.89 | | | |

Output Hourly Performance Data

Output Results as Text

About the Hourly Performance Data

Saving Text from a Browser

Run PVWATTS v.1 for another US location or an International location Run PVWATTS v.2 (US only)

Please send questions and comments regarding PVWATTS to Webmaster

Disclaimer and copyright notice



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

APPENDIX G

EPA Portfolio Manager



STATEMENT OF ENERGY PERFORMANCE **Thomas Conley Elementary School**

Building ID: 3310752 For 12-month Period Ending: June 30, 20121 Date SEP becomes ineligible: N/A

N/A

Facility Owner

Date SEP Generated: October 31, 2012

Primary Contact for this Facility

N/A

OMB No. 200

Facility Thomas Conley Elementary School 940 Iron Bridge Road Asbury, NJ 08802

Year Built: 1978 Gross Floor Area (ft2): 59,584

Energy Performance Rating² (1-100) 32

| Electricity - Grid Purchase(kBtu) Fuel Oil (No. 2) (kBtu) | 2,156,149 2,358,293 |
|--|------------------------|
| Natural Gas - (kBtu) ⁴ | 0 |
| Total Energy (KBtu) | 4,314,442 |
| | |
| Site (kDtu/ft2/ur) | 76 |
| Sile (KDlu/Il/yr) | 161 |
| Source (KBlu/Il-/yr) | 101 |
| Emissions (based on site energy use) | |
| Greenhouse Gas Emissions (MtCO ₂ e/year) | 479 |
| | 170 |
| Electric Distribution Utility | |
| Jersey Central Power & Light Co [FirstEnergy Corp] | |
| | |
| National Median Comparison | |
| National Median Site EUI | 64 |

| National Median Site EUI | 64 |
|--|--------|
| National Median Source EUI | 137 |
| % Difference from National Median Source EUI | 18% |
| Building Type | K-12 |
| 0 51 | School |

| 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 | | | |

| Stamp of Certifying Professional |
|----------------------------------|

Certifying Professional N/A

Notes:

Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
 The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
 Values represent energy consumption, annualized to a 12-month period.

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.

The government estimates the average time needed to fill out this form is 6 hours (includes the time for entering energy data, Licensed Professional facility inspection, and notarizing the SEP) and welcomes suggestions for reducing this level of effort. Send comments (referencing OMB control number) to the Director, Collection Strategies Division, U.S., EPA (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460.



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 | $\mathbf{\nabla}$ |
|---|---|--|-------|-------------------|
| Building Name | Thomas Conley Elementary School | Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings? | | |
| Туре | K-12 School | Is this an accurate description of the space in question? | | |
| Location | 940 Iron Bridge Road, Asbury, NJ 08802 | 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. | | |
| Thomas Conley Elem | entary School (K-12 School) | | r | |
| CRITERION | VALUE AS ENTERED IN PORTFOLIO MANAGER | VERIFICATION QUESTIONS | NOTES | $\mathbf{\nabla}$ |
| Gross Floor Area | 59,584 Sq. Ft. | Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stainwells, 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 | 50 | 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 | 50 % | 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? | | |

| heroPlot Po heroPlot Po heroPlot Po h 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'. | Recorder Recorder Recorder | Sol Barres |
|--|----|--|----------------------------------|------------|
|--|----|--|----------------------------------|------------|



ENERGY STAR[®] Data Checklist for Commercial Buildings



Energy Consumption

Power Generation Plant or Distribution Utility: Jersey Central Power & Light Co [FirstEnergy Corp]

| Fuel Type: Electricity | | | | |
|--|---|--|--|--|
| Meter: Electric Meter (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase | | | | |
| Start Date | End Date | Energy Use (kWh (thousand Watt-hours)) | | |
| 06/01/2012 | 06/30/2012 | 47,449.00 | | |
| 05/01/2012 | 05/31/2012 | 47,835.00 | | |
| 04/01/2012 | 04/30/2012 | 51,593.00 | | |
| 03/01/2012 | 03/31/2012 | 49,280.00 | | |
| 02/01/2012 | 02/29/2012 | 66,452.00 | | |
| 01/01/2012 | 01/31/2012 | 52,842.00 | | |
| 12/01/2011 | 12/31/2011 | 58,240.00 | | |
| 11/01/2011 | 11/30/2011 | 58,240.00 | | |
| 10/01/2011 | 10/31/2011 | 45,440.00 | | |
| 09/01/2011 | 09/30/2011 | 56,640.00 | | |
| 08/01/2011 | 08/31/2011 | 53,760.00 | | |
| 07/01/2011 | 07/31/2011 | 44,160.00 | | |
| Electric Meter Consumption (kWh (thousand V | Vatt-hours)) | 631,931.00 | | |
| Electric Meter Consumption (kBtu (thousand Btu)) | | 2,156,148.57 | | |
| Total Electricity (Grid Purchase) Consumption | (kBtu (thousand Btu)) | 2,156,148.57 | | |
| Is this the total Electricity (Grid Purchase) con Electricity meters? | sumption at this building including all | | | |
| Fuel Type: Fuel Oil (No. 2) | | | | |
| Meter: Fuel Oil (Gallons) Space(s): Entire Facility | | | | |
| Start Date | End Date | Energy Use (Gallons) | | |
| 06/01/2012 | 06/30/2012 | 0.00 | | |
| 05/01/2012 | 05/31/2012 | 0.00 | | |
| 04/01/2012 | 04/01/2012 04/30/2012 5,0' | | | |
| 03/01/2012 | 03/31/2012 | 0.00 | | |
| 02/01/2012 | 02/29/2012 | 4,004.00 | | |
| 01/01/2012 | 01/31/2012 | 4,983.00 | | |
| 12/01/2011 | 12/31/2011 | 0.00 | | |
| 11/01/2011 | 11/30/2011 | 3,005.00 | | |
| 10/01/2011 | 10/31/2011 | 10/31/2011 0.00 | | |
| 09/01/2011 09/30/2011 0.00 | | | | |

| Pro | | | | Acro |
|--|--|--------------|-----------|---------|
| ONI | 08/01/2011 | 08/31/2011 | 0.00 | |
| | 07/01/2011 | 07/31/2011 | 0.00 | -net to |
| on.com Oil | Consumption (Gallons) | · | 17,004.00 | WWW.cad |
| Fuel Oil Consumption (kBtu (thousand Btu)) | | 2,358,293.26 | | |
| Total Fuel Oil (No. 2) Consumption (kBtu (thousand Btu)) | | 2,358,293.26 | | |
| Is this the total Fuel Oil (No. 2) consumption at this building including all Fuel Oil (No. 2) meters? | | | | |
| Additiona | al 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. | | | |

| 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.)

_____Date:_____ Name: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.



FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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



Facility

Thomas Conley Elementary School 940 Iron Bridge Road Asbury, NJ 08802 Facility Owner N/A **Primary Contact for this Facility** N/A

General Information

| Thomas Conley Elementary School | | | |
|--|---------------|--|--|
| Gross Floor Area Excluding Parking: (ft ²) | 59,584 | | |
| Year Built | 1978 | | |
| For 12-month Evaluation Period Ending Date: | June 30, 2012 | | |

Facility Space Use Summary

| Thomas Conley Elementary School | | | |
|--|-------------|--|--|
| Space Type | K-12 School | | |
| Gross Floor Area (ft2) | 59,584 | | |
| Open Weekends? | No | | |
| Number of PCs | 50 | | |
| Number of walk-in refrigeration/freezer units | 2 | | |
| Presence of cooking facilities | Yes | | |
| Percent Cooled | 50 | | |
| Percent Heated | 100 | | |
| Months ° | 10 | | |
| High School? | No | | |
| School District ° | Bethlehem | | |

Energy Performance Comparison

| | Evaluation Periods | | Comparisons | | | |
|------------------------------|-------------------------------------|--------------------------------------|---------------|--------|-----------------|--|
| Performance Metrics | Current (Ending Date 06/30/2012) | Baseline (Ending Date 06/30/2012) | Rating of 75 | Target | National Median | |
| Energy Performance Rating | 32 | 32 | 75 | N/A | 50 | |
| Energy Intensity | | | | | | |
| Site (kBtu/ft2) | 76 | 76 | 50 | N/A | 64 | |
| Source (kBtu/ft2) | 161 | 161 | 107 | N/A | 137 | |
| Energy Cost | | | | | | |
| \$/year | \$ 155,495.49 | \$ 155,495.49 | \$ 103,492.64 | N/A | \$ 132,346.63 | |
| \$/ft²/year | \$ 2.61 | \$ 2.61 | \$ 1.74 | N/A | \$ 2.22 | |
| Greenhouse Gas Emissions | | | | | | |
| MtCO ₂ e/year | 479 | 479 | 319 | N/A | 408 | |
| kgCO ₂ e/ft²/year | 8 | 8 | 5 | N/A | 7 | |

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

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.