CDM Smith

Final Energy Audit Report

Westfield School District
October 21, 2015

Table of Contents

Table of Contents

Appendices

Executive Summary

Executecutive Summary

As part of an initiative to reduce energy cost and consumption, Westfield Board of Education has secured the services of CDM Smith to perform an energy audit for twelve (12) facilities which are owned and operated by the Board, in an effort to develop comprehensive Energy Conservation and Retrofit Measures (ECRMs).

CDM Smith's energy audit team visited the facilities August 10, 2015 – August 12, 2015. As a result of the site visit and evaluation of the historical energy usage of the facilities, CDM Smith was successful in identifying opportunities for energy savings measures.

CDM Smith evaluated the potential for renewable energy technologies to be implemented at the Board's facilities to offset the electrical energy usage. Specifically, the use of solar electric photovoltaic panels and wind turbines were investigated.

Not all ECRMs identified as a result of the energy audit are recommended. ECRMs must be economically feasible to be recommended to the Board for implementation. The feasibility of each ECRM is measured through a simple payback analysis. The simple payback period is determined after establishing Engineer's Opinion of Probable Construction Cost estimates. Operation and maintenance (O&M) cost estimates, projected annual energy savings estimates are included in the payback analysis. The potential value of New Jersey Clean Energy rebates, or Renewable Energy Credits, if applicable, are also included in the analysis. ECRMs with a payback period of 20 years or less can be recommended.

Historical Energy Usage

The following table, Table ES-1, summarizes the historical energy usage at each of the Board's facilities as presented in Section 3. The data in Table ES-1 has been taken from the facility data forms, provided by the Board. These values can serve as a bench-marking tool. The building profiles that have been established through the EPA's Portfolio Manager Program. This program quantifies the reduction in electrical energy and natural gas usage following the implementation of the recommended ECRMs.

Table ES-1

Summary of Annual Energy Usage & Cost

	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	Fuel Use for Entire Building (therms)	Cost for Electric Service	Cost for Fuel
Westfield High School	1,261,778	794	576	99,843	$222,269	$87,409
Edison Intermediate School	437,077	178	182	30,731	$71,536	$31,869

	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	Fuel Use for Entire Building (therms)	Cost for Electric Service	Cost for Fuel
Roosevelt Intermediate School	566,412	212	248	47,105	$103,994	$43,165
Franklin Elementary School	193,479	127	74	28,980	$36,115	$24,925
Jefferson Elementary School	175,337	117	57	28,250	$32,095	$26,720
Lincoln Elementary School	289,160	125	140	8,616	$52,657	$7,876
McKinley Elementary School	169,030	93	59	28,379	$29,445	$25,515
Tamaques Elementary School	173,409	127	65	10,158	$31,735	$9,290
Washington Elementary School	153,766	94	59	12,856	$28,914	$18,445
Wilson Elementary School	176,446	111	61	26,263	$33,032	$21,988
Administration Building	153,480	79	55	20,615	$27,570	$17,082
Kehler Stadium Field House	34,842	14	23	3,271	$6,229	$3,082

Recommended ECRMs

The following Table ES-2 presents the ranking of recommended ECRMs identified for the building lighting and HVAC systems based on the simple payback analysis.

Additional ECRMs associated with the building envelope and other miscellaneous appliances were identified and evaluated, as discussed in Sections 2 and 4; however, were not recommended due to longer payback periods. This table includes the Engineer's Opinion of Probable Construction Cost, projected annual energy cost savings, projected annual energy usage savings, and total simple payback period for each recommended ECRM. The ECRMs are ranked based on payback period.

Table ES-2
Ranking of Recommended ECRMs

Overall Ranking (Based on Simple Payback)	Location	Total Cost [1]	Energy Savings	Annual Savings [2]	Simple Payback
1	Washington Elementary School DHW	$2,487	0 kWh 615 therms	$529	4.7
2	Roosevelt Intermediate School Lighting Upgrade	$93,257	371,054 kWh 0 therms	$11,083	8.4
3	Westfield High School Lighting Upgrade	$804,260	126,072 kWh 0 therms	$86,270	9.3

Overall Ranking (Based on Simple Payback)	Location	Total Cost [1]	Energy Savings	Annual Savings [2]	Simple Payback
4	Wilson Elementary School Lighting Upgrade	$164,119	51,204 kWh 0 therms	$16,491	10
5	Franklin Elementary School Lighting Upgrade	$100,108	43,983 kWh 0 therms	$9,909	10.1
6	Lincoln Elementary School Lighting Upgrade	$143,958	147,218 kWh 0 therms	$14,243	10.1
7	Edison Intermediate School Lighting Upgrade	$312,098	57,868 kWh 0 therms	$30,023	10.4
8	McKinley Elementary School Lighting Upgrade	$77,815	31,133 kWh 0 therms	$7,200	10.8
9	Administration Building Lighting Upgrade	$122,317	10,494 kWh 0 therms	$11,083	11
10	Jefferson Elementary School Lighting Upgrade	$361,256	49,749 kWh 0 therms	$31,159	11.6
11	Washington Elementary School Lighting Upgrade	$152,517	72,941 kWh 0 therms	$12,697	12
12	Tamaques Elementary School Lighting Upgrade	$31,952	46,464 kWh 0 therms	$2,552	12.5
13	McKinley Elementary School Condensing Boilers	$37,477	0 kWh 2,358 therms	$2,445	15.3

1. Engineers Probable Construction Cost takes into account any applicable rebates.
2. Annual Fiscal Savings takes into account additional O&M cost or savings associated with the measure.
3. Negative savings, or increased energy consumption resulting from a measure, are indicated in red, with parentheses
4. This project may be eligible for higher incentives through the NJCEP Pay for Performance (P4P) program. Please see Section 7 for more information.

Renewable Energy Technologies

Solar Energy

Section 4 of the report provides for an economic evaluation of a solar energy system at several of the Board facilities. The evaluation covered the economic feasibility of the Board installing a solar energy system under a typical construction contract and to assume full responsibility of the operation of such a system.

Based on a simple payback model, summarized in Table ES-3, the Board should not investigate the installation of a solar energy system at these 12 buildings. Other options such as Power Purchase Agreements are potentially available as well to help finance the project. Solar technology is constantly changing and will most likely continue to lower in price.

Two major factors influencing the project financial evaluation is the variance of the prevailing energy market conditions and Solar Renewable Energy Credit (SREC) rates, with the largest impact to the payback model being the SREC credit pricing. For the payback model, conservative estimates of the SREC's market value over a 25 year period were assumed, as discussed in Section 4.

Table ES-3 includes a simple payback analysis for the installation of a solar energy system at the identified Board buildings.

Table ES-3
Simple Payback Analysis for Solar Energy Systems

Building	Retrofit Cost	Annual SREC Credit	First Year Production	Annual Fiscal Savings	Simple Payback (Years)
Westfield High School	$ 1,625,000	$ 43,410	237,800	$ 42,804	19.9
Edison Intermediate School	$ 687,500	$ 16,279	89,175	$ 14,268	23.9
Roosevelt Intermediate School	$ 1,250,000	$ 32,558	566,412	$ 32,103	20.5
Franklin Elementary School	$ 1,625,000	$ 43,410	237,800	$ 45,182	19.4
Jefferson Elementary School	$ 1,250,000	$ 32,558	178,350	$ 32,103	20.5
Lincoln Elementary School	$ 875,000	$ 21,705	118,900	$ 21,402	21.5
McKinley Elementary School	$ 687,500	$ 16,279	89,175	$ 15,160	23.2
Tamaques Elementary School	$ 875,000	$ 21,705	118,900	$ 21,402	21.5
Washington Elementary School	$ 500,000	$ 10,853	59,450	$ 11,296	23.9
Wilson Elementary School	$ 500,000	$ 10,853	59,450	$ 11,296	23.9
Administration Building	$ 500,000	$ 10,853	59,450	$ 10,701	24.6
Kehler Stadium Field House	$ 162,500	$ 1,085	5,945	$ 1,070	79.8

Wind Power Generation

Section 4 of the report provides for an economic evaluation of a wind turbine energy system. The evaluation covered the economic feasibility of furnishing and installing a wind turbine energy system under a typical construction contract and to assume full responsibility of the operation of such a system.

CDM Smith completed a preliminary desktop wind power production analysis and has concluded that the Board should reevaluate on site wind power when NJ clean energy incentives are published.

Wind power as a renewable energy source also qualifies for Renewable Energy Certificates (REC's). The prevailing energy market, Renewable Energy Incentive Program (REIP) and REC's comprise the major factors influencing a wind turbine energy system installation.

Other options, such as government bonds or a Power Purchase Agreement are potentially available and can assist with the financing of this project.

Recommended ECRMs

Table ES-4 summarizes the Total Engineer's Opinion of Probable Construction Cost, annual energy savings, projected annual energy and O&M cost savings and the payback period based on the implementation of all of the above recommended ECRMs.

Table ES-4
Recommended ECRM's

Total Engineer's Opinion of Probable Construction Cost	Projected Annual Energy Savings	Projected Annual Fiscal Savings	Simple Payback Period (years)
$2,403,621	2,973 Therms 1,008,180 kWh	$235,684	10.20

Operation and Maintenance Measures

Operation and Maintenance

Facility staff have a good understanding of the buildings and energy usage. Facility staff are presently limited by building control systems connection to the district control system. Increasing the ability to control the building systems will enable facility staff to better control the building energy usage.

The existing building systems are in generally good condition. Systems are having annual maintenance and cleaning. The items that have been neglected are like refrigerant pipe insulation on dX split systems. The insulation is degraded by sun, physically damaged and missing. Replacing the insulation reduces the energy lost to the outdoor air. Replacing the insulation on the dx cooling lines will create cooling energy savings.

Section 1

Section 1
Introduction

1.1 General

As part of an initiative to reduce energy cost and consumption, Westfield Board of Education has secured the services of Camp Dresser McKee & Smith (CDM Smith) to perform an energy audit at twelve (12) facilities in an effort to develop comprehensive energy conservation initiatives. The costs associated with this energy audit report qualify for reimbursement through New Jersey Clean Energy Local Government Energy Audit Program.

The performance of an Energy Audit requires a coordinated phased approach to identify, evaluate and recommend energy conservation and retrofit measures (ECRM). The various phases conducted under this Energy Audit included the following:

Gather preliminary data on all facilities;

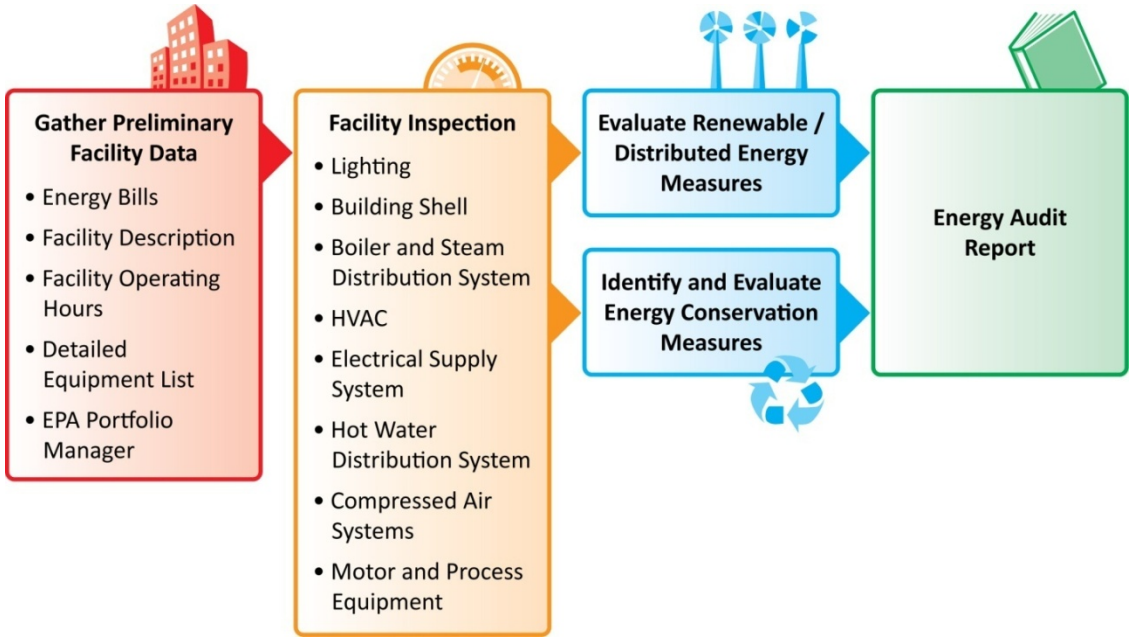
Facility inspection;

Identify and evaluate potential ECRMs and evaluate renewable/distributed energy measures;

Develop the energy audit report.

Figure 1-1 is a schematic representation of the phases utilized by CDM Smith to prepare the Energy Audit Report

Figure 1-1: Energy Audit Phases



1.2 Background

The following is a brief summary of each of the facilities included in this energy audit.

Westfield High School was constructed in 1925 and is approximately 302,300 square feet. It is normally occupied by 147 employees and 1,836 students.

Edison Intermediate School was constructed in 1953 and is approximately 124,900 square feet. It is normally occupied by 62 employees and 860 students.

Roosevelt Intermediate School was constructed in 1925 and is approximately 112,900 square feet. It is normally occupied by 56 employees and 728 students.

Franklin Elementary School was constructed in 1930 and is approximately 65,800 square feet. It is normally occupied by 45 employees and 601 students.

Jefferson Elementary School was constructed in 1953 and is approximately 47,850 square feet. It is normally occupied by 35 employees and 477 students.

Lincoln Elementary School was constructed in 1922 and is approximately 26,980 square feet. It is normally occupied by 278 students.

McKinley Elementary School was constructed in 1908 and is approximately 61,140 square feet. It is normally occupied by 25 employees and 344 students.

Tamaques Elementary School was constructed in 1960 and is approximately 48,350 square feet. It is normally occupied by 30 employees and 446 students.

Washington Elementary School was constructed in 1960 and is approximately 36,050 square feet. It is normally occupied by 23 employees and 302 students.

Wilson Elementary School was constructed in 1952 and is approximately 45,600 square feet. It is normally occupied by 32 employees and 387 students.

Administration Building was constructed in 1914 and is approximately 60,000 square feet. It is normally occupied by 30 employees and 0 students

Kehler Stadium Field House was constructed in 2000 and is approximately 5,000 square feet. It is normally unoccupied. The building houses the teams, coaches, and officials during sporting games.

1.3 Purpose and Scope

An ASHRAE level II energy audit includes conducting a detailed survey of a facility and analyzing its energy consumption. This effort provides a list of potential capital-intensive improvements (energy conservation and retrofit measures, or ECRMs). These ECRM's require more thorough data collection and engineering analysis, along with an estimate of associated potential costs and savings.

The objective of this energy audit is to identify energy conservation and retrofit measures. In an effort to reduce facility energy usage and to develop an economic basis to financially validate the planning and implementation of ECRM's.

Significant energy savings may be available with retrofits to the heating and cooling systems and lighting systems.

It should be noted that the magnitude of energy savings available is not only dependent on the type of heating, lighting or insulation systems in use. The age and condition of the equipment and the capital available to implement major changes influence energy savings. Due to the rising cost of power and the desire to minimize dependence on foreign oil supplies, energy consumption is taking a higher priority across the nation. Feasible alternatives for reducing energy consumption and operating costs must be evaluated on a case-by-case basis.

The purpose of this energy audit is to identify the various critical building comfort systems that are major consumers of electrical energy and are clear candidates for energy savings measures. In addition, potential energy producing systems such as solar electric and wind energy systems were also evaluated. A discussion on these technologies is included in Section 4 Energy Conservation and Retrofit Measures (ECRM).

In addition to identifying ECRMs and the potential for on-site energy generation, there is potential for further energy cost savings through the use of a third party energy supplier and participation in a Demand Response Program. This is discussed further in Section 5.

Section 2

Section 2
Facility Description

2.1 Westfield High School

2.1.1 Description of Building Envelope

The energy audit includes an evaluation of the building's envelope (exterior shell) to determine the components' effective R-values to be utilized in the building model and to locate and fix any thermal weaknesses that may be present. The components of a building envelope include the exterior walls, foundation and roof. The construction and material, age and general condition of these components, including exterior windows and doors, impact the building's energy use.

Westfield High School was constructed in 1925 and additions were added in 2003. The exterior walls of Westfield High School are of brick and mortar façade with concrete block interior construction.

Most of the building windows were noted to be operable, double pane and aluminum frame, with good seals and in good condition.

Most exterior doors are steel construction with weather-stripping and are in good condition. FRP doors are recommended on an energy efficiency level. FRP doors are made out of a high strength, light weight material with energy saving insulation and good sealing ability. FRP doors do not expand or contract with changing weather.

CDM Smith did not observe any significant gaps in exterior passageways or other obvious points of leakage in the building envelope that would warrant immediate corrective measures. While some repairs and upgrades may be recommended, modifications to the insulation system would not prove to be cost-effective, from an energy savings standpoint. However, caulking or installing weather-stripping at drafty spots, on windows, or doors along the building envelope is good practice. Caulking and weather-stripping can help to lower overall building infiltration rates, and therefore heating or cooling energy consumption.

Overall the building envelope is in good condition and is currently providing a sufficient level of insulation.

2.1.2 Description of Building Mechanical Systems

The building spaces are conditioned by eight roof top units, which provide heating and cooling. Several of the roof top units range from 3 to 8 tons of cooling. The split roof top unit provides 20-40 tons of cooling. The units are air cooled with dx coils. The building has an air cooled chiller. The unit is presumed to cool the cafeteria, library and adjacent areas. Refrigerant pipe insulation was observed to be in poor condition or missing.

The heating steam and hot water is supplied by two steam boilers and two domestic hot water boilers. The gas-fired steam boilers were manufactured by Cleaver Brooks in 1983 and the hot water boilers were manufactured by Parker Boiler Co. in 2007, and have an input rating of 730 and 1,410 MBH, respectively. There are two separate hot water condensing boilers for the science wing. These boilers were manufactured in Aerco in 2002 and have an input rating of 2,000 MBH.

The hot water is circulated by six total hot water pumps; there are four hot water pumps in the main boiler room and two in the science wing boiler room.

Westfield High School has a number of window air conditioning units. There are split system air conditioning units in the Music Rooms.

The building has a gas-fired water heater, manufactured by AO Smith in 2002, in the science wing boiler room. The main boiler room has two Parker water heating boilers have an input rating of 1,410 MBH.

2.1.3 Description of Building Lighting

The building lighting is primarily 4 foot T8 lamps. The fixtures vary by section of the school. The observed fixture include 1X4 pendant, and 2X4 and 2X2 recessed and surfaced.

Many fixtures are retrofitted with compact fluorescent lamps. The gym and locker rooms have T5 lamp fixtures. Some incandescent and halogen lamps remain. All observed exit fixtures are LED lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.2 Edison Intermediate School

2.2.1 Description of Building Envelope

The Edison Intermediate School was constructed in 1953. The exterior walls are of brick and mortar façade with concrete block interior construction.

The building roof is mainly built-up with an EPDM membrane. The roof is in good condition.

Most of the building windows were noted to be double pane aluminum framed, with good seals and in good condition.

Most exterior doors are steel construction with weather-stripping and are in good condition. FRP doors are recommended on an energy efficiency level. FRP doors are made out of a high strength, light weight material with energy saving insulation and good sealing ability. FRP doors do not expand or contract with changing weather.

CDM Smith did not observe any significant gaps in exterior passageways or other obvious points of leakage in the building envelope that would warrant immediate corrective measures. While some repairs and upgrades may be recommended, modifications to the insulation system would not prove to be cost-effective, from an energy savings standpoint. However, caulking or installing weather stripping at drafty spots, on windows, or doors along the building envelope is good practice. Caulking and weather stripping can help to lower overall building infiltration rates, and therefore heating or cooling energy consumption.

2.2.2 Description of Building Mechanical Systems

The building spaces are conditioned by Nesbitt unit ventilators with pneumatic controls. The larger spaces have unit heaters and make up air units. The heating hot water is supplied by three hot water condensing boilers. The boilers are manufactured by Aerco.

The building has one domestic water heater, manufactured by AO Smith in 2012. There are five hot water pumps and five VFDs.

The space cooling is provided by a number of window air conditioning units in the classrooms. There are also three split system air conditioning units. There is a Trane rooftop unit that provides cooling to the library. A Carrier roof top unit that provides cooling to the kitchen.

2.2.3 Description of Building Lighting

The building lighting is primarily 4 foot T8 lamps. The fixtures vary by section of the school. The observed fixture include 1X4 pendant, and 2X4 and 2X2 recessed and surfaced.

Many fixtures are retrofitted with compact fluorescent lamp fixtures. The Auditorium has LED fixtures. Some incandescent lamps remain. All observed exit fixtures are LED lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.3 Roosevelt Intermediate School

2.3.1 Description of Building Envelope

Roosevelt Intermediate School was constructed in 1925 and additions were added in 1960. The exterior walls are of brick and mortar façade with concrete block, brick, or finished interior.

The building windows are double pane, aluminum frame, with good seals and in good condition. Interior blinds are installed on all windows.

Roosevelt Intermediate School has several classrooms with window air conditioning units.

The exterior doors are sealed, steel construction are in good condition. FRP doors are recommended on an energy efficiency level.

FRP doors are made out of a high strength, light weight material with energy saving insulation and good sealing ability. FRP doors do not expand or contract with changing weather.

Overall the building envelope is in good condition and is currently providing a sufficient level of insulation.

2.3.2 Description of Building Mechanical Systems

The building spaces are conditioned by steam radiators and steam unit ventilators with pneumatic controls.

The heating steam is generated by two Cleaver Brooks steam boilers; manufactured in 1960. The space heating, hot water is generated by an Aerco condensing boiler.

The building has two heating hot water pumps. The pump motors were manufactured by Armstrong.

The space cooling is provided by window air conditioning units in the classrooms and administrative offices. There are a few ductless split system air conditioning units.

2.3.3 Description of Building Lighting

The building lighting is primarily 4 foot T8 lamps. The fixtures appear to have been retrofitted with new electronic ballasts and T8 lamps. These lamps are installed in a variety of fixture configurations including 1X4 surface and suspended, and 2X4 and 2X2 recessed and surfaced.

Many fixtures are retrofitted with compact fluorescent lamps. The gym has T5 lamp fixtures. Some T12 lamps and magnetic ballasts remain. Some incandescent and halogen lamps remain. All observed exit fixtures are LED lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.4 Franklin Elementary School

2.4.1 Description of Building Envelope

Franklin Elementary School was constructed in 1930 and additions were added in 2000. The exterior walls are of brick and plaster finished interior. The addition is steel framed with block walls and brick façade. The walls of the original building are assumed to have no insulation installed. The addition is assumed to have R-11 insulation installed.

The older building has a pitched roof with asphalt shingles and flat roofing with bitumen rolls. The building addition has flat roof with rubber membrane surfaces.

The building windows are double pane, aluminum frame, with good seals and in good condition. Interior blinds are installed on all windows. The windows appear to be about 10 years old.

Franklin Elementary School has several classrooms with window air conditioning units, along with several split unit air conditioners in the second floor classrooms.

Overall the building envelope is in good condition and is currently providing a sufficient level of insulation.

2.4.2 Description of Building Mechanical Systems

The building spaces are conditioned by steam unit ventilators. There is full direct digital control.

The heating steam is supplied by two gas-fired steam boilers. The boilers were manufactured by Easco in 2012 and have an input capacity of 5,250 MBH. Each boiler has a Power Flame burner.

Space cooling of classrooms is provided by window air conditioning units. There are two split system air conditioning units serving the second floor classrooms of the building.

The building has one gas-fired water heater, manufactured by Rheem. The tank has a storage capacity of 50 gallons and the heater has an input rating of 38 MBH.

2.4.3 Description of Building Lighting

The lighting system is primarily 1X4 surface mounted and 2X4 recessed T8 fixtures. Classrooms and offices have occupancy sensors to control the lighting. Other fixtures have retrofitted with CFL's. All observed exit fixtures are LED lamped.

Building electrical systems are accessible and in good condition. Each addition had different electrical layouts.

2.5 Jefferson Elementary School

2.5.1 Description of Building Envelope

The Jefferson Elementary School was constructed in 1953. The exterior walls of the Jefferson Elementary School are of brick and mortar façade with concrete block finished interior. The building roof consists of a flat roof with an EPDM membrane. The building is assumed to have no insulation installed.

Most of the building windows were noted to be double pane, aluminum frame, and in good condition.

Jefferson Elementary School has window air conditioning units in most classrooms. If these window units are left in through the winter, it is recommended that air conditioning sleeves be installed to minimize the infiltration of ambient air. Classrooms on the end of the hallways have split system air conditioning units with outdoor condensers. Refrigerant pipe insulation was observed to be in poor condition or missing.

Most exterior doors consist of steel construction and are in good condition.

It was notified by the staff that there are several cold rooms on the ends of the hallway. It was recommended that the glass corridor be insulated.

2.5.2 Description of Building Mechanical Systems

The building spaces are conditioned by steam unit ventilators with pneumatic controls.

The heating steam is supplied by three gas-fired steam boilers. The boilers were manufactured by Superior in 1953.

The space cooling is provided by window air conditioning units in the classrooms and offices. Six of the unit ventilators have air conditioning units built in with split system cooling coils and outdoor condensing units.

The building has one gas-fired Rheem domestic water heater. The water heater has a storage capacity of 50 gallons and an assumed input rating of 50 MBH.

2.5.3 Description of Building Lighting

The lighting system is primarily 2X4 surface mounted and 2X4 recessed T8 fixtures. Some fluorescent fixture are CFL, 2X2 fixtures or 1X8. Very few observed fixtures are incandescent. All observed exit fixtures are LED lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.6 Lincoln Elementary School

2.6.1 Description of Building Envelope

The Lincoln Elementary School was constructed in 1922 and renovated in 2008. The original exterior walls of are of brick and mortar façade with masonry infill. The renovation installed interior finishes with steel studs and a drywall finished interior.

The building roof consists of a flat roof with an EPDM membrane. The EPDM portions of the roof are in great condition.

The building windows were new vinyl, double pane, with good seals and in excellent condition.

The exterior doors are steel construction with a double pane view window glazing.

The building is assumed to have R-11 insulation.

Overall the building envelope is in good condition and is currently providing a sufficient level of insulation.

2.6.2 Description of Building Mechanical Systems

The building spaces are conditioned by water source heat pumps for each classroom. The water loop is cooled by a cooling tower.

The water loop is heated by two gas-fired hot water condensing boilers with an input rating of 1,000 MBH. There are two heating hot water pumps, rated at 3 and 5 HP, respectively.

2.6.3 Description of Building Lighting

The lighting system were upgraded in 2008 and is primarily 1X4 surface mounted and 2X2 and 2X4 recessed T8 fixtures. Classrooms and offices have occupancy sensors to control the lighting. Other fixtures have CFL's. All observed exit fixtures are LED lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.7 McKinley Elementary School

2.7.1 Description of Building Envelope

The McKinley Elementary School was constructed in 1908 with an addition in 2000. The exterior walls of are of brick and mortar with plaster or raw brick interior.

The roof is timber framed with wood decking. The building consists of portions of a flat and sloped roof. The sloped roof has a slate finish.

Most of the building windows were noted to be double pane, vinyl, with good seals and in good condition. Interior blinds are on most windows. Some of the windows have exterior screens installed.

Most exterior doors are steel construction. FRP doors are recommended on an energy efficiency level. FRP doors are made out of a high strength, light weight material with energy saving insulation and good sealing ability. FRP doors do not expand or contract with changing weather.

Overall the building envelope is in good condition and is currently providing a sufficient level of insulation.

2.7.2 Description of Building Mechanical Systems

The building spaces are conditioned by steam unit ventilators with pneumatic controls. The pneumatic controls have been abandoned and replaced by a local direct digital control (DDC) system. Building ventilation appears to have been added with fans that exhaust out the original window framing.

The heating steam and hot water is supplied by one gas-fired steam boiler and one hot water boiler. There are two heating hot water pumps and two condensate return pumps.

The space cooling of the classrooms and offices is provided by window air conditioning units.

2.7.3 Description of Building Lighting

The lighting system is primarily 1X4 surface mounted and 2X4 recessed fixtures. Fixtures have primarily T8 with electronic ballast. Only a few fixtures with T12 lamps and magnetic ballasts were observed. Other fixtures have compact fluorescent, incandescent lamps or have been retrofitted with CFL's. Observed exit fixtures are LED or fluorescent lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.8 Tamaques Elementary School

2.8.1 Description of Building Envelope

The Tamaques Elementary School was constructed in 1960. The exterior walls are of brick and mortar façade with block, or finished interior. The building is assumed to have insulation installed.

The building roof consists of a flat roof with an EPDM membrane. The roof is in good condition.

Most of the building windows were noted to be double pane, aluminum frame, with good seals and in good condition. Exterior screens are installed on all windows.

The exterior doors are steel construction with a double pane view window glazing.

Overall the building envelope is in good condition.

2.8.2 Description of Building Mechanical Systems

The building spaces are conditioned by unit ventilators with pneumatic controls. The unit vents have hot water coils for space heating.

The heating hot water is generated by two gas-fired hot water boilers. The boilers were manufactured by Aerco in 2015 and each has an input rating of 2,000 MBH. There are two hot water pumps, manufactured by Armstrong. The pump motors are rated at 3 HP.

The space cooling is provided by window air conditioning units. The library has a split system air conditioning unit with outdoor condenser. Refrigerant pipe insulation was in poor condition or missing.

2.8.3 Description of Building Lighting

The lighting system is primarily 1X4 surface mounted and 2X2, 2X4 recessed T8 fixtures. Other fixtures are plug in fluorescent, or incandescent. A few screw in fixtures have been retrofitted with CFL's. The gym has metal halide fixtures that are assumed to be 400 watts each. All observed exit fixtures are LED lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.9 Washington Elementary School

2.9.1 Description of Building Envelope

The Washington Elementary School was constructed in 1960. The exterior walls are of brick and mortar façade with a concrete block or finished interior. The walls are assumed to have not insulation installed.

The building roof consists of a flat roof with an EPDM membrane. The roof is assumed to have no insulation installed.

The building windows are double pane with aluminum frames. The windows are horizontal slider configuration. The hallway windows have single pane windows with aluminum frames.

Overall the building envelope is in good condition and is currently providing a sufficient level of insulation.

2.9.2 Description of Building Mechanical Systems

The building spaces are conditioned by four 2-ton split system air conditioning units with remote condensing units. Refrigerant pipe insulation was observed to be in poor condition or missing. Four classrooms are conditioned by unit ventilators; with self-contained cooling systems

The classrooms are heated and ventilated by unit vents. These units have steam heating coils. The steam is generated by two gas-fired HB Smith boilers. The boilers have an input rating of 2,146 MBH.

The space cooling of the classrooms and administrative offices is provided by window air conditioning units.

There is one gas-fired domestic water heater. The heater was manufactured by Rheem in 2013, has a storage capacity of 50 gallons, and has an input rating of 38 MBH.

2.9.3 Description of Building Lighting

The lighting system is primarily 1X4 surface mounted and 2X2, 2X4 recessed T8 fixtures. A few T12 fixtures with magnetic ballasts were observed. Classrooms and offices have manual lighting controls. Other fixtures have retrofitted with CFL's. All observed exit fixtures are LED lamped

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.10 Wilson Elementary School

2.10.1 Description of Building Envelope

The Wilson Elementary School was constructed in 1935 and has had two additions. The exterior walls are of many different constructions. The walls were observed to be solid brick, block with brick façade, and steel structure with masonry infill.

The building roof consists of mostly a pitched roof with steel structure, slate exterior, and concrete decking. The additions have a flat roof.

The building windows were noted to be double pane aluminum frame. Some of the windows have interior blinds.

Overall the building envelope is in good condition and is currently providing a sufficient level of insulation.

2.10.2 Description of Building Mechanical Systems

The building spaces are conditioned by unit ventilators with pneumatic controls. The unit ventilators have hot water heating coils.

The heating steam is generated by two gas-fired HB Smith steam boilers, each with a Power Flame burner.

The space cooling of the classrooms is provided by window air conditioning units.

The building is served by one gas-fired AO Smith domestic water heater, with a storage capacity of 74 gallons.

2.10.3 Description of Building Lighting

The lighting system is primarily 1X4 and 2X2, 2X4 surface mounted T8 fixtures. All spaces had manual lighting controls. Other fixtures include plug in fluorescents incandescent and screw in fixtures retrofitted with CFL's. All observed exit fixtures are LED lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.11 Administration Building

2.11.1 Description of Building Envelope

The Administration Building was constructed in 1914 and additions for the maintenance garage and elevator were added. The exterior walls of the Administration Building are of brick and mortar façade with concrete block interior construction. The walls are assumed to have no insulation installed. The building has an addition of an elevator and lobby.

The building roof consists of a flat roof with a bitumen rolls. The roof is assumed to have no insulation installed.

Most of the building windows were noted to be double pane, however, there were some single pane.

The site also has a vehicle garage. The garage has 2 bays. The building is block walls with brick façade and a flat roof with bitumen rolled roofing.

2.11.2 Description of Building Mechanical Systems

The building spaces are conditioned by two split system air conditioning units with Fujitsu Halcyon condensing units, located on the roof. Each unit has a 9,000 BTU/H cooling and 10,000 BTU/H heating capacity. The Board Room is conditioned by electric heaters, while the maintenance garage is heated by two Modine gas-fired unit heaters.

The heating is generated by one gas-fired HB Smith steam boiler with an input rating of 3,300 MBH. The garage has a few gas-fired unit heaters.

The space cooling of the offices and rooms is provided by window air conditioning units and split system.

The building contains one AO Smith domestic water heater.

2.11.3 Description of Building Lighting

The lighting system is primarily 1X4 surface mounted and 2X4 recessed T8 fixtures. Some T12 fixtures with magnetic ballasts were observed. Other fixtures included plug in fluorescents, incandescent and screw in fixtures retrofitted with CFL's. All observed exit fixtures are LED lamped.

Building electrical systems are in good condition. Each addition had different electrical layouts.

2.12 Kehler Stadium Field House

2.12.1 Description of Building Envelope

The Kehler Stadium Field House is comprised of two buildings, which contain an athletic trainer's room, locker rooms, athletic offices, and a weight room. The second building is newer and is designated for the girl's athletic teams. The building's exterior walls are poured concrete.

The majority of the roof is flat. The older building of the Field House is built underneath athletic bleachers. The newer building of the Field House has a partially peaked roof with skylights,

2.12.2 Description of Building Mechanical Systems

The stadium is heated by steam unit heaters. The unit heaters are supplied by a Weil McLain steam boiler. The space cooling was limited to the training area.

The newer building space is conditioned by a rooftop air handling unit. The unit is assumed to be gas heated with air cooled dx cooling coil.

The original building has a small gas fired storage water heater that supplies the locker rooms. The domestic hot water in the new building is generated by a Raytherm hot water boiler.

2.12.3 Description of Building Lighting

The buildings have a mix of T8 and T5 fixtures with electronic ballasts. Many fixtures have compact fluorescents. All interior lighting is manually controlled.

The site electrical service is distributed from outdoor switchgear to the individual buildings. Each building has a breaker panel. The electrical equipment is in good condition.

Section 3

Section 3
Baseline Energy Use

3.1 Utility Data Analysis

The first step in the energy audit process is the compilation and quantification of the facility's current and historical energy usage and associated utility costs. It is important to establish the existing patterns of electricity, gas, and oil usage in order to be able to identify areas in which energy consumption can be reduced.

For this study, the monthly gas and electric bills per facility were analyzed and unit costs of energy were obtained. The unit cost of energy, as determined from the information provided by the Board, these costs were used to determine the feasibility of switching from one energy source to another or reducing energy demand to generate annual cost savings.

3.1.1 Electric Charges

It is also important to understand how the utilities charge for the service. The majority of the energy consumed is electric as a result of both indoor and outdoor lighting and appliances, such as kitchen appliances, computers, printers and projectors. Electricity is charged by three basic components: electrical consumption (kWh), electrical demand (kW) and power factor (kVAR) (reactive power). The cost for electrical consumption is similar to the cost for fuel. The monthly consumption appears on the utility bill as kWh monthly with a unit cost associated with it. The service connections are either billed on a flat rate or time of day rates per kWh.

Electrical demand can be as much as 50 percent or more of the electric bill. The maximum demand (kW value) during the billing period is multiplied by the demand cost factor and the result is added to the electric bill. It is often possible to decrease the electric bill by 15 – 25 percent by reducing the demand, while still using the same amount of energy.

The power factor (reactive power) is the power required to energize electric and magnetic fields that result in the production of real power. Power factor is important because transmission and distribution systems must be designed and built to manage the need for real power, as well as the reactive power component (the total power). If the power factor is low, then the total power required can be greater than 50 percent than the real power alone. The power factor charge is a penalty for having a low power factor. Fortunately, this penalty charge does not impact the Board.

The other parts of the electric bill are the supply charges, delivery charges, system benefits, transmission revenue adjustments, state and municipality tariff surcharges and sales taxes, which cannot be avoided.

Public Service Electric & Gas (PSE&G) is the current distributor and supplier of electric energy for all Board facilities included in this report.

3.1.2 Natural Gas Charges

PSE&G is the current distributor of natural gas for all Board facilities included in this report. The natural gas supplier is unclear for the majority of the schools. The Board should verify natural gas costs before moving forward on energy savings projects.

3.2 Facility Results

3.2.1 Westfield High School

Electric power for Westfield High School is fed from two Secondary three phase line from PSE&G. Figure 3.2-1 illustrates the monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Westfield High School is approximately 105,000 kWh/month.

Table 3.2-1 illustrates the seasonal peak demand loads for Westfield High School from August, 2014 through August, 2015. Monthly consumption rates have been re-ordered as needed to illustrate a typical January-December year. This approach has been taken for all monthly utility consumption graphs shown in this report. The information presented is only as recent as the most recent bill received.

Figure 3.2-1: Westfield High School Electricity Usage

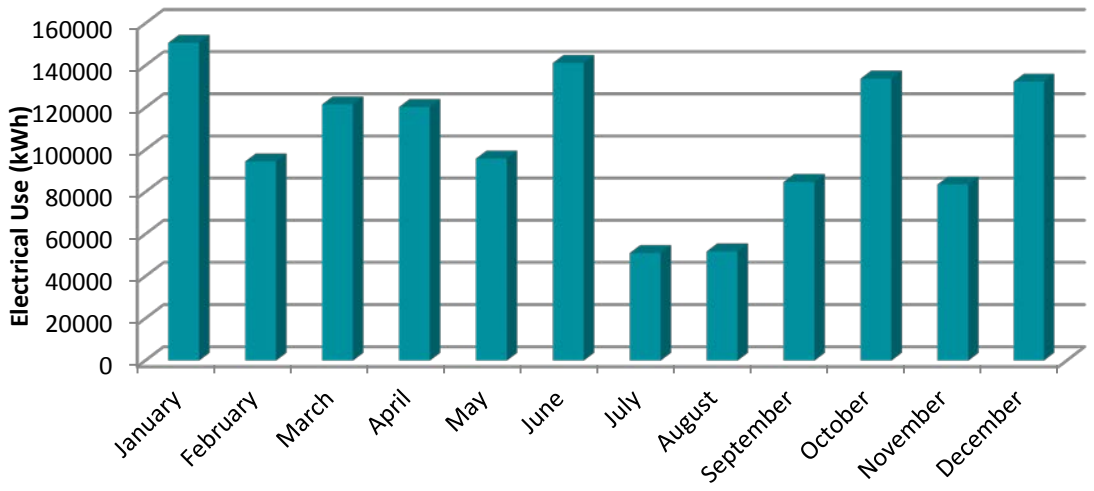


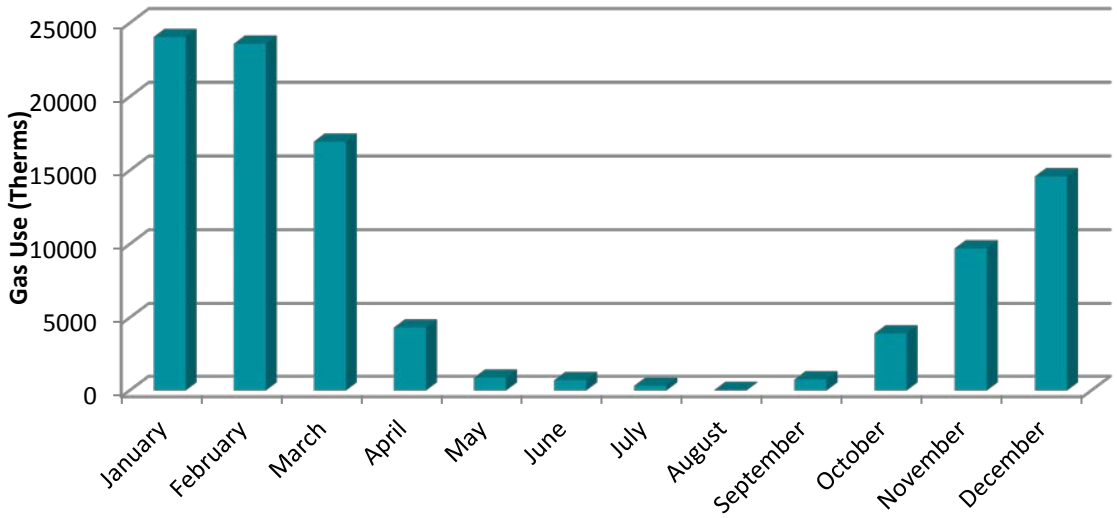
Table 3.2-1: Westfield High School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	794
Winter	576

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-2 illustrates the monthly average natural gas consumption at Westfield High School from August, 2014 through August, 2015.

Figure 3.2-2: Westfield High School Gas Usage



3.2.2 Edison Intermediate School

Electric power for Edison Intermediate School is fed from one General Service Secondary three phase line PSE&G. Figure 3.2-3 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Edison Intermediate School is approximately 36,000 kWh/month.

Table 3.2-2 illustrates the seasonal peak electrical demand loads for Edison Intermediate School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-3: Edison Intermediate School Electricity Usage

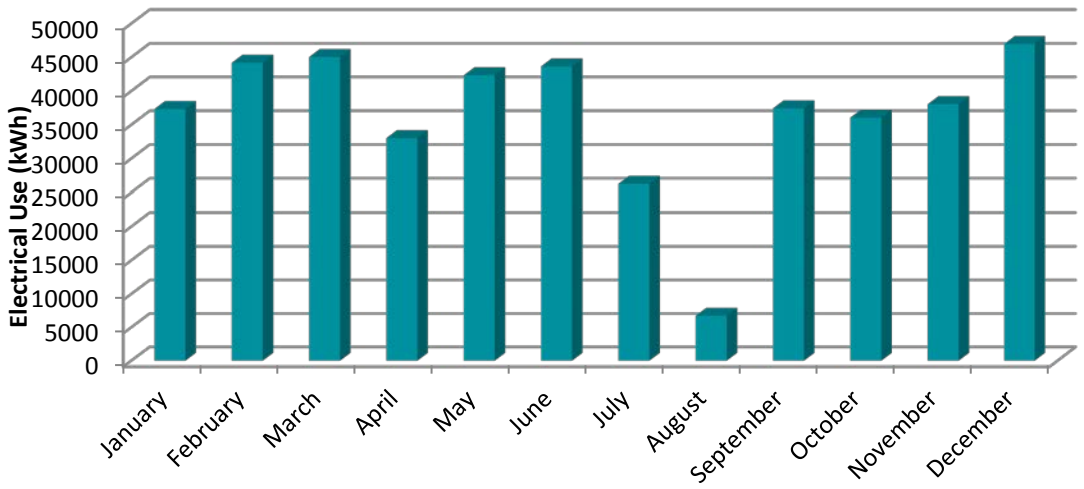


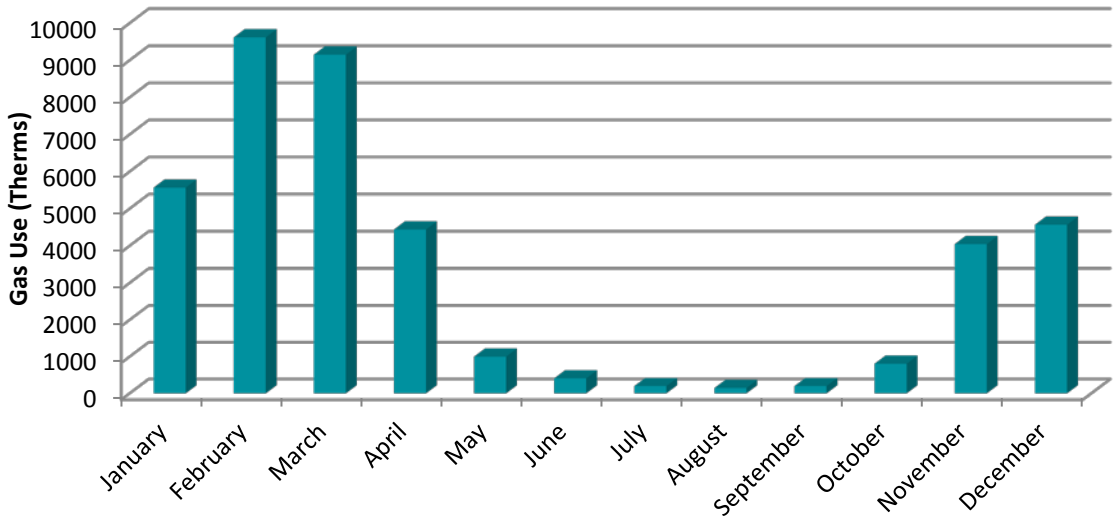
Table 3.2-2: Edison Intermediate School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	178
Winter	182

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-4 illustrates the monthly average natural gas consumption at Edison Intermediate School from August, 2014 through August, 2015.

Figure 3.2-4: Edison Intermediate School Gas Usage



3.2.3 Roosevelt Intermediate School

Electric power for Roosevelt Intermediate School is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-5 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Roosevelt Intermediate School is approximately, 47,000 kWh/month.

Table 3.2-3 illustrates the seasonal peak electrical demand loads for Roosevelt Intermediate School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-5: Roosevelt Intermediate School Electricity Usage

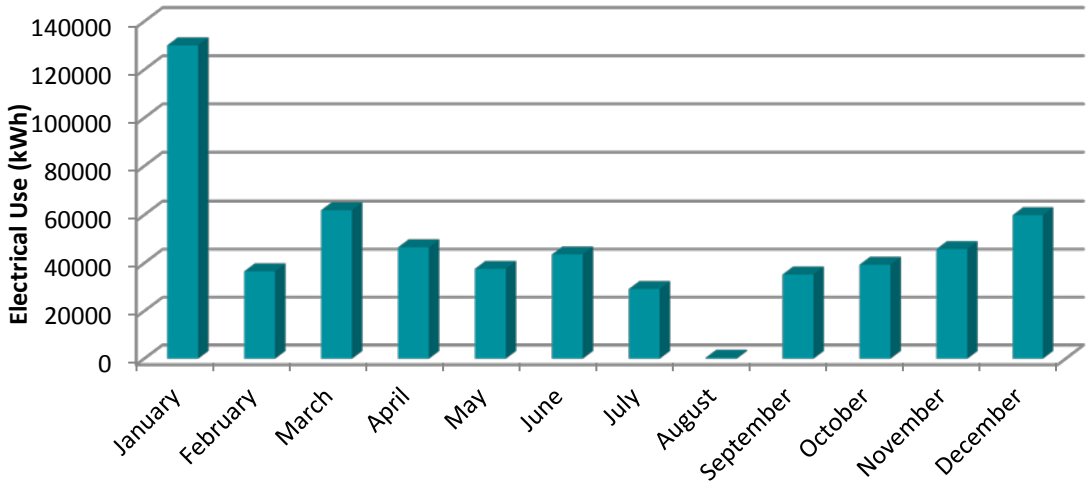


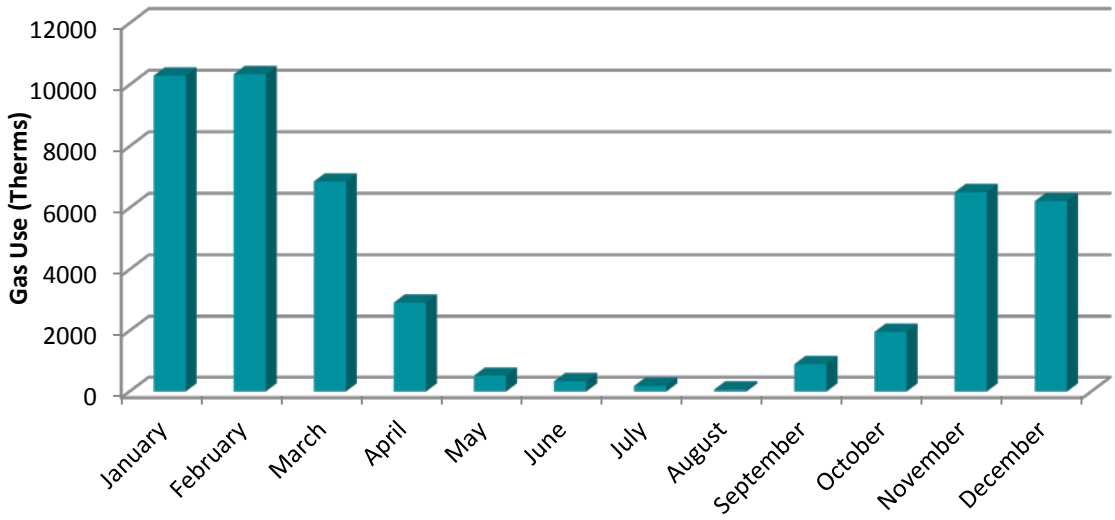
Table 3.2-3: Roosevelt Intermediate School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	212
Winter	248

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-6 illustrates the monthly average natural gas consumption at Roosevelt Intermediate School from August, 2014 through August, 2015.

Figure 3.2-6: Roosevelt Intermediate School Gas Usage



3.2.4 Franklin Elementary School

Electric power for Franklin Elementary School is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-7 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Franklin Elementary School is approximately 16,000 kWh/month.

Table 3.2-4 illustrates the seasonal peak electrical demand loads for Franklin Elementary School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-7: Franklin Elementary School Electricity Usage

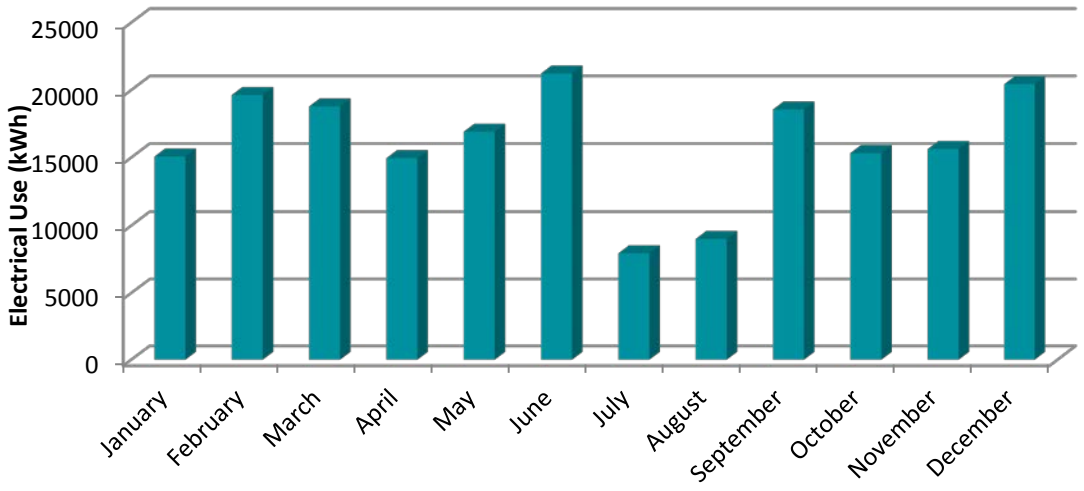


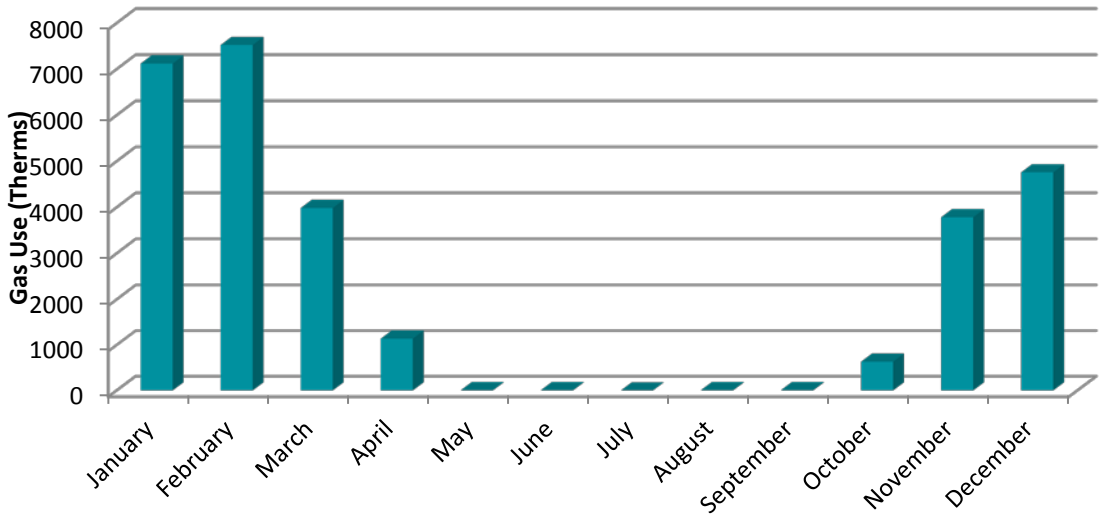
Table 3.2-4: Franklin Elementary School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	127
Winter	74

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-8 illustrates the monthly average natural gas consumption at Franklin Elementary School from August, 2014 through August, 2015.

Figure 3.2-8: Franklin Elementary School Gas Usage



3.2.5 Jefferson Elementary School

Electric power for Jefferson Elementary School is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-1 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Jefferson Elementary School is approximately 15,000 kWh/month.

Table 3.2-5 illustrates the seasonal peak electrical demand loads for Jefferson Elementary School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-8: Jefferson Elementary School Electricity Usage

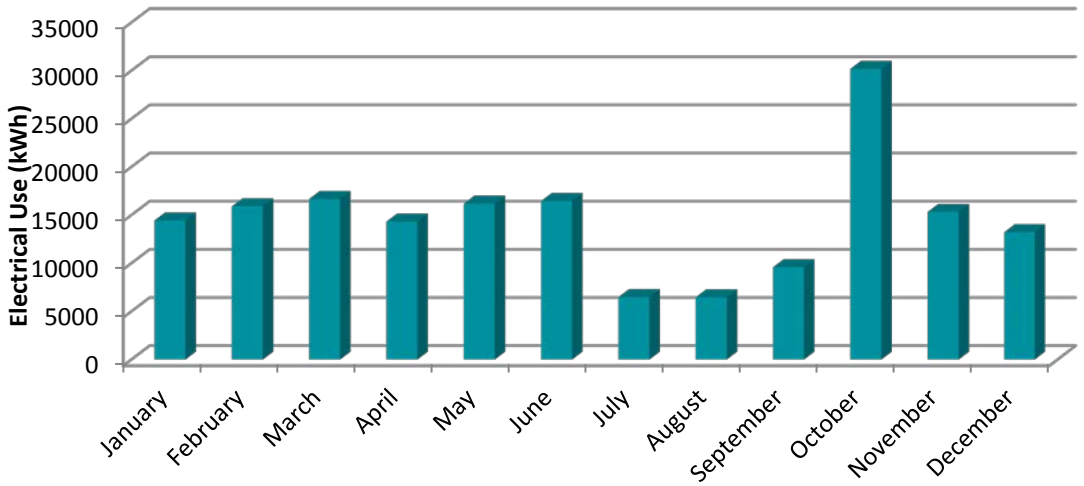


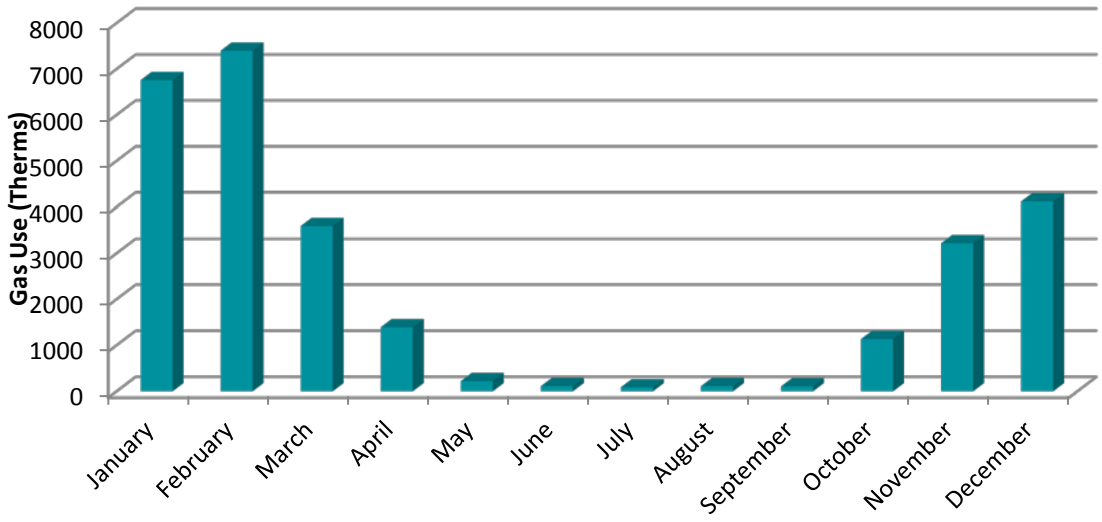
Table 3.2-5: Jefferson Elementary School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	117
Winter	57

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-9 illustrates the monthly average natural gas consumption at Jefferson Elementary School from August, 2014 through August, 2015.

Figure 3.2-9: Jefferson Elementary School Gas Usage



3.2.6 Lincoln Elementary School

Electric power for Lincoln Elementary School is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-10 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Lincoln Elementary School is approximately 24,000 kWh/month.

Table 3.2-6 illustrates the seasonal peak electrical demand loads for Lincoln Elementary School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-10: Lincoln Elementary School Electricity Usage

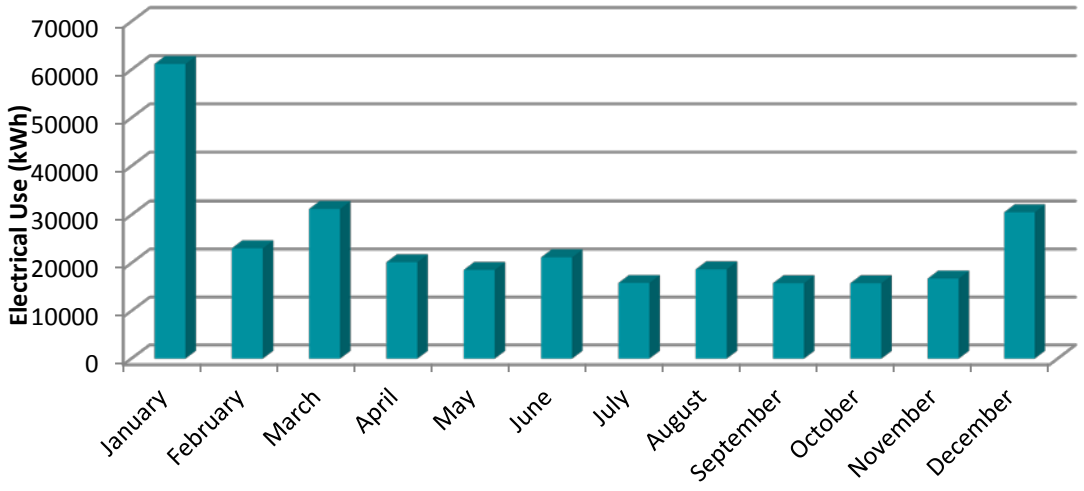


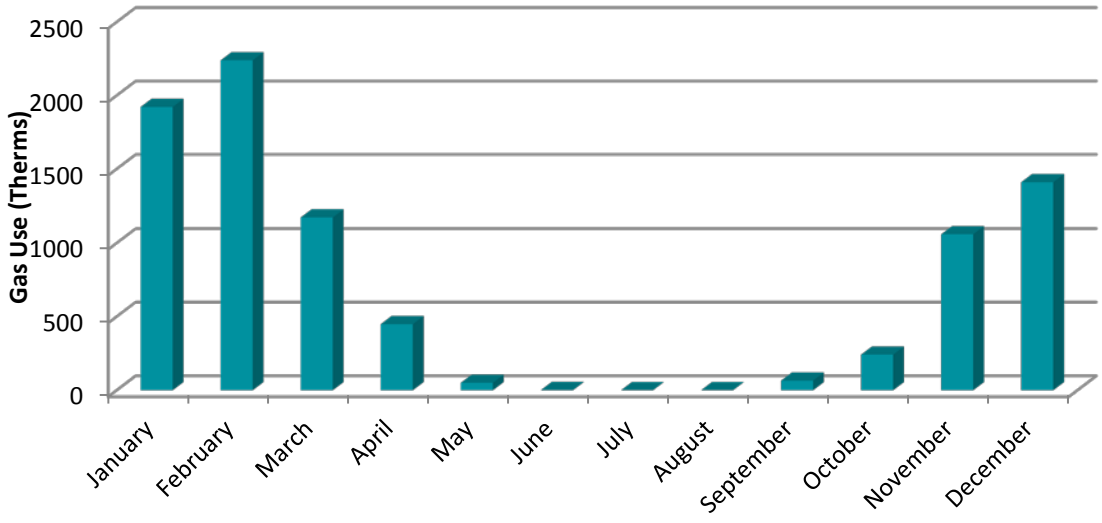
Table 3.2-6: Lincoln Elementary School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	125
Winter	140

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-11 illustrates the monthly average natural gas consumption at Lincoln Elementary School from August, 2014 through August, 2015.

Figure 3.2-11: Lincoln Elementary School Gas Usage



3.2.7 McKinley Elementary School

Electric power for McKinley Elementary School is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-12 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for McKinley Elementary School is approximately 14,000 kWh/month during the time period considered in this analysis.

Table 3.2-7 illustrates the seasonal peak electrical demand loads for McKinley Elementary School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-12: McKinley Elementary School Electricity Usage

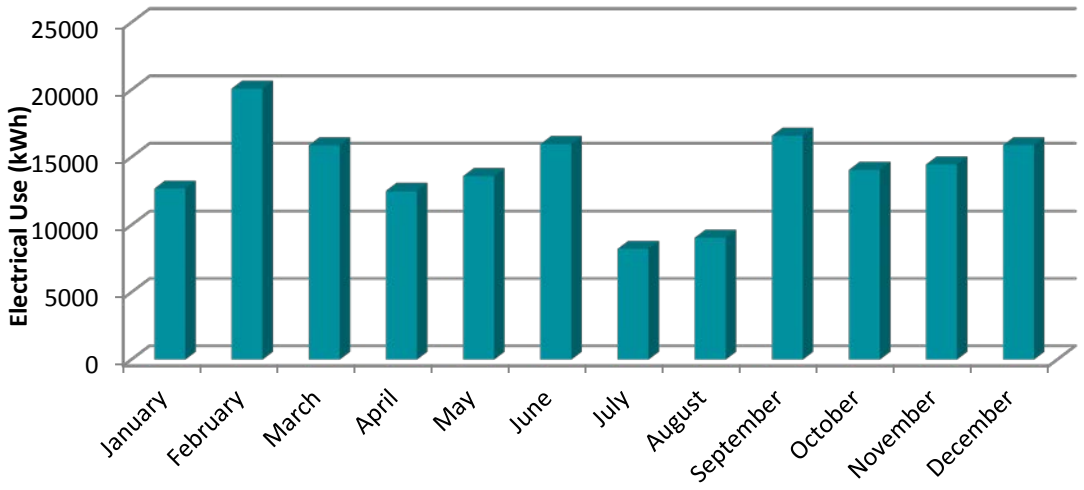


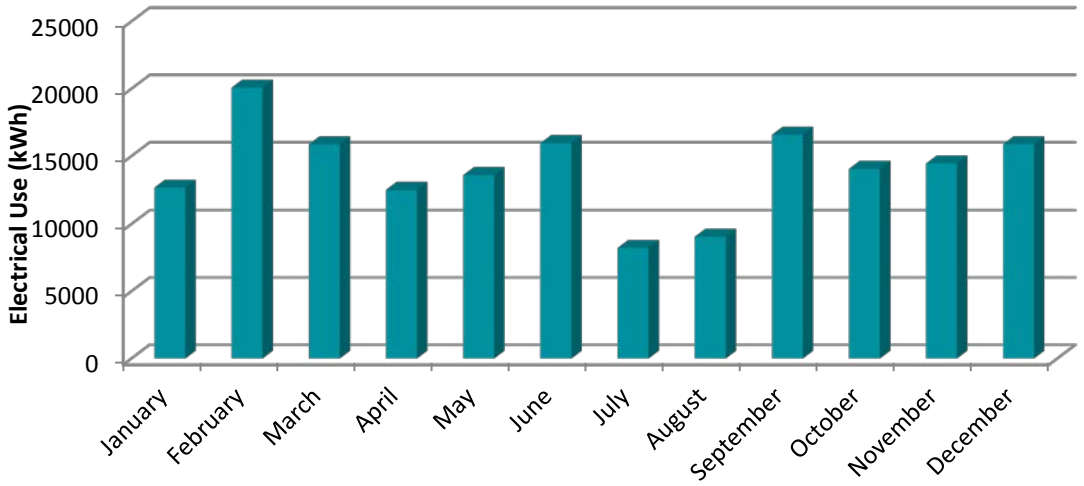
Table 3.2-7: McKinley Elementary School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	93
Winter	59

Refer to Table 3.3-13, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-6 illustrates the monthly average natural gas consumption at McKinley Elementary School from August, 2014 through August, 2015.

Figure 3.2-13: McKinley Elementary School Gas Usage



3.2.8 Tamaques Elementary School

Electric power for Tamaques Elementary School is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-14 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Tamaques Elementary School is approximately 14,000 kWh/month.

Table 3.2-8 illustrates the seasonal peak electrical demand loads for Tamaques Elementary School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-14: Tamaques Elementary School Electricity Usage

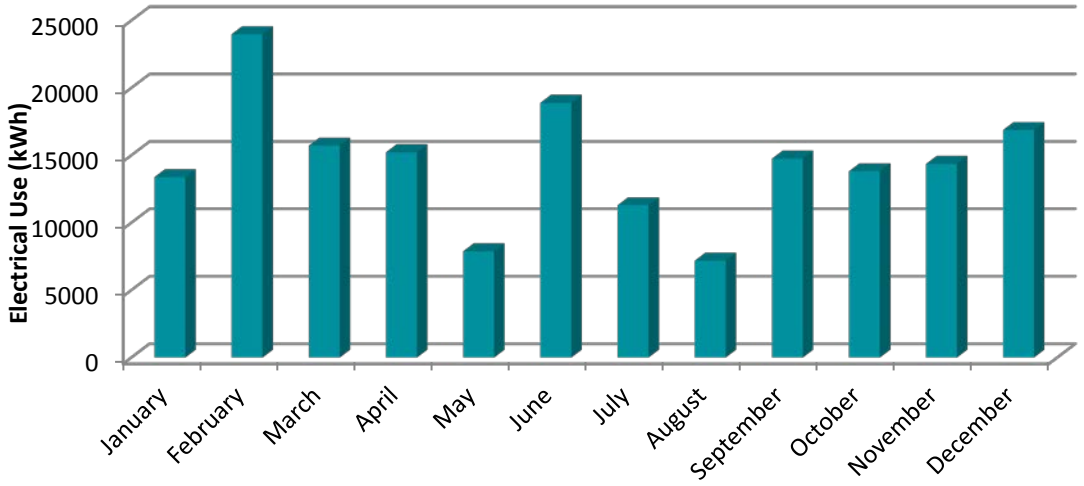


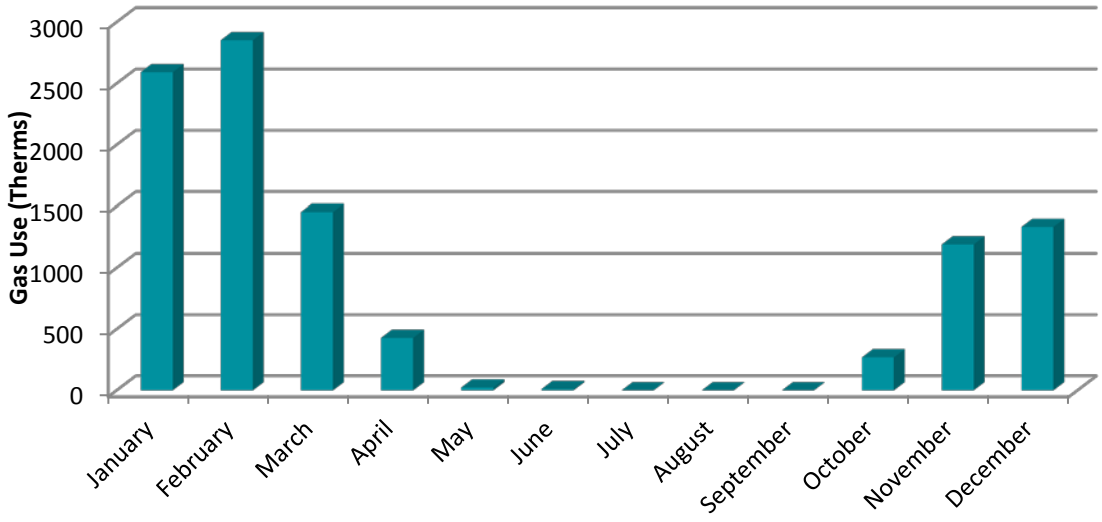
Table 3.2-8: Tamaques Elementary School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	127
Winter	65

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-15 illustrates the monthly average natural gas consumption at Tamaques Elementary School from August, 2014 through August, 2015.

Figure 3.2-15: Tamaques Elementary School Gas Usage



3.2.9 Washington Elementary School

Electric power for Washington Elementary School is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-16 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for South Mountain Elementary School is approximately 13,000 kWh/month.

Table 3.2-9 illustrates the seasonal peak demand loads for Washington Elementary School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-16: Washington Elementary School Electricity Usage

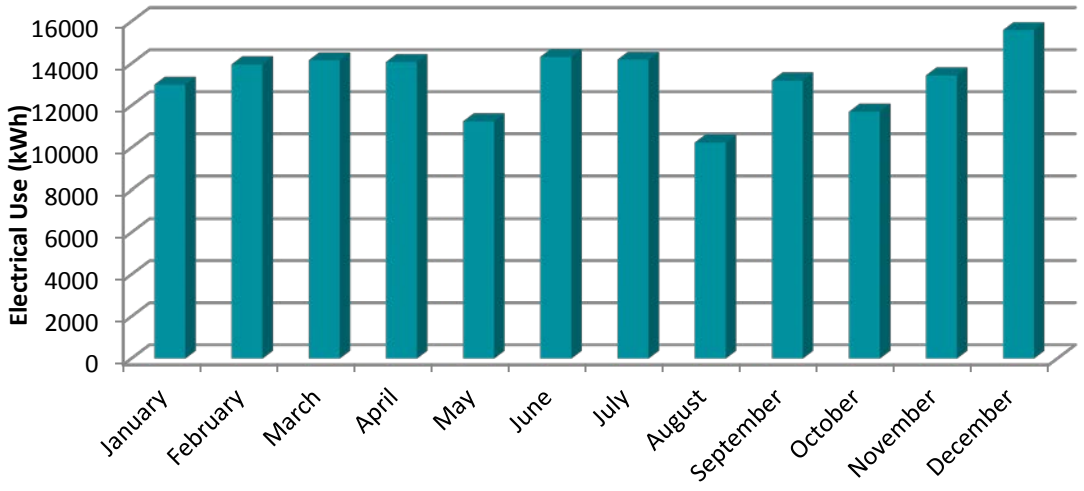


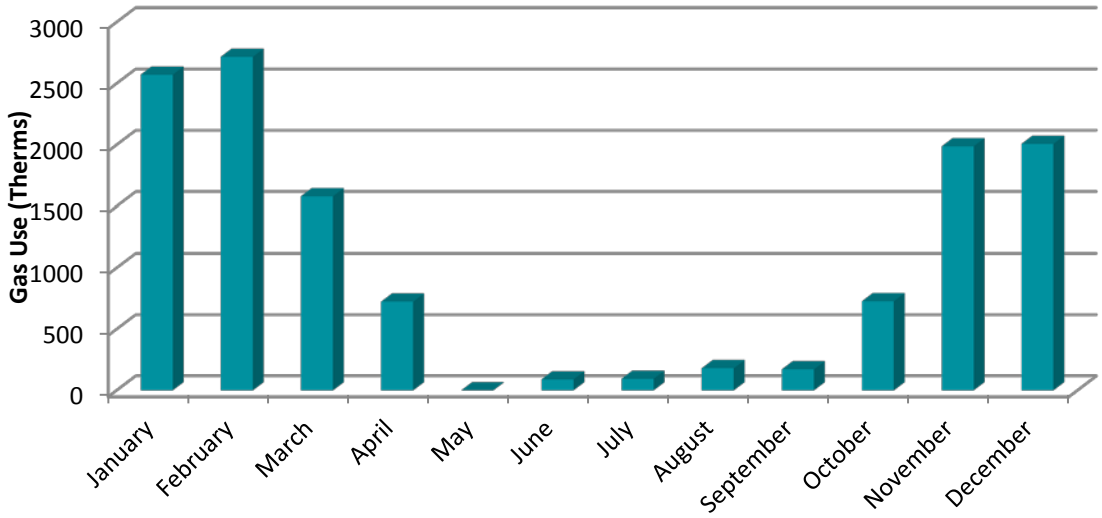
Table 3.2-9: Washington Elementary School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	94
Winter	59

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-17 illustrates the monthly average natural gas consumption at Washington Elementary School from August, 2014 through August, 2015.

Figure 3.2-17: Washington Elementary School Gas Usage



3.2.10 Wilson Elementary School

Electric power for Wilson Elementary School is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-18 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Wilson Elementary School is approximately, 15,000 kWh/month.

Table 3.2-10 illustrates the seasonal peak electrical demand loads for Wilson Elementary School from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-18: Wilson Elementary School Electricity Usage

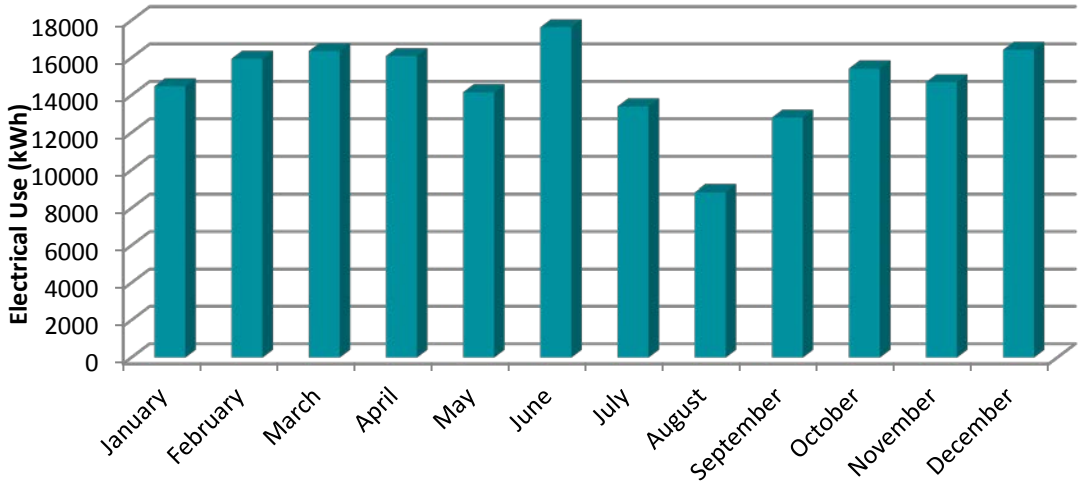


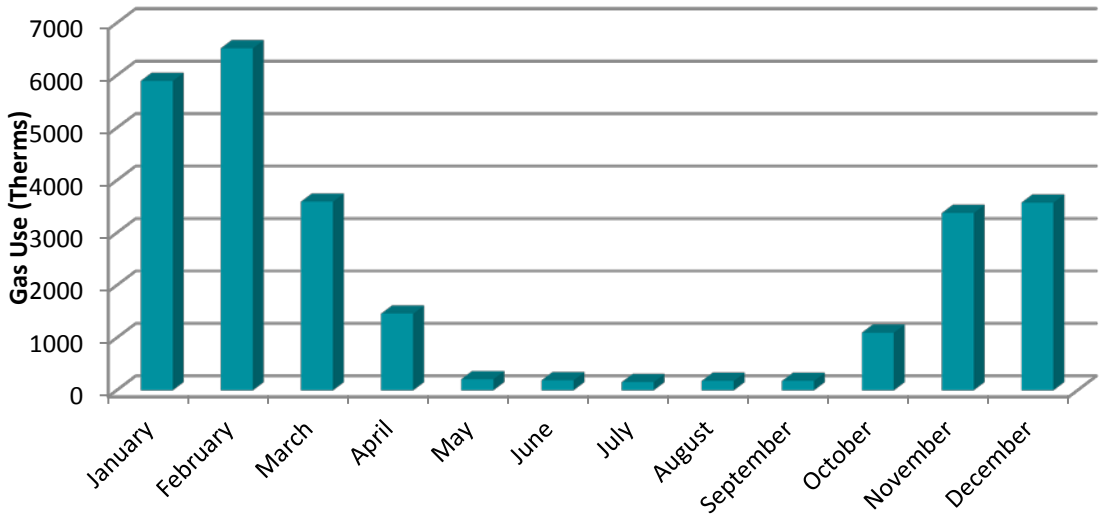
Table 3.2-10: Wilson Elementary School Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	111
Winter	61

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-19 illustrates the monthly average natural gas consumption at Wilson Elementary School from August, 2014 through August, 2015.

Figure 3.2-19: Wilson Elementary School Gas Usage



3.2.11 Administration Building

Electric power for Administration Building is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-20 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Administration Building is approximately 13,000 kWh/month.

Table 3.2-11 illustrates the seasonal peak electrical demand loads for Administration Building from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-20: Administration Building Electricity Usage

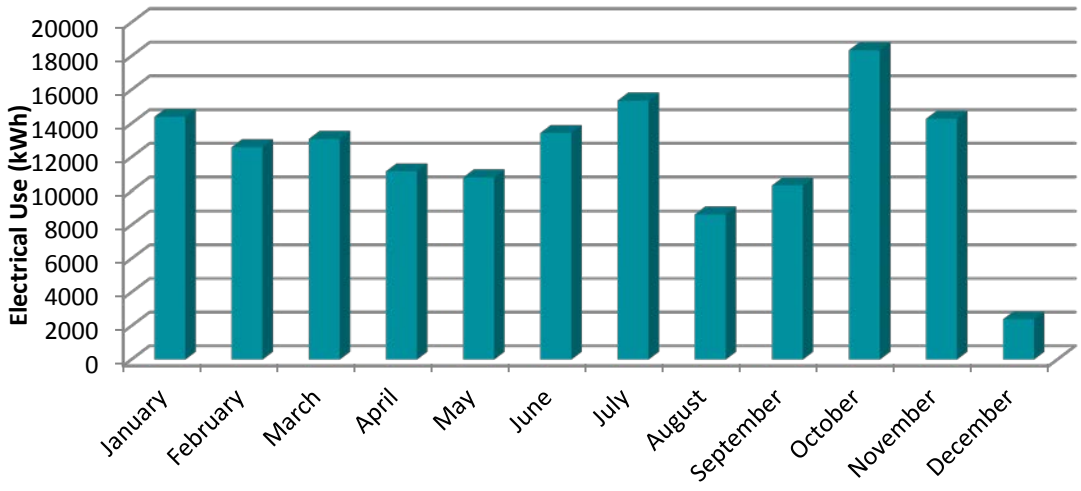


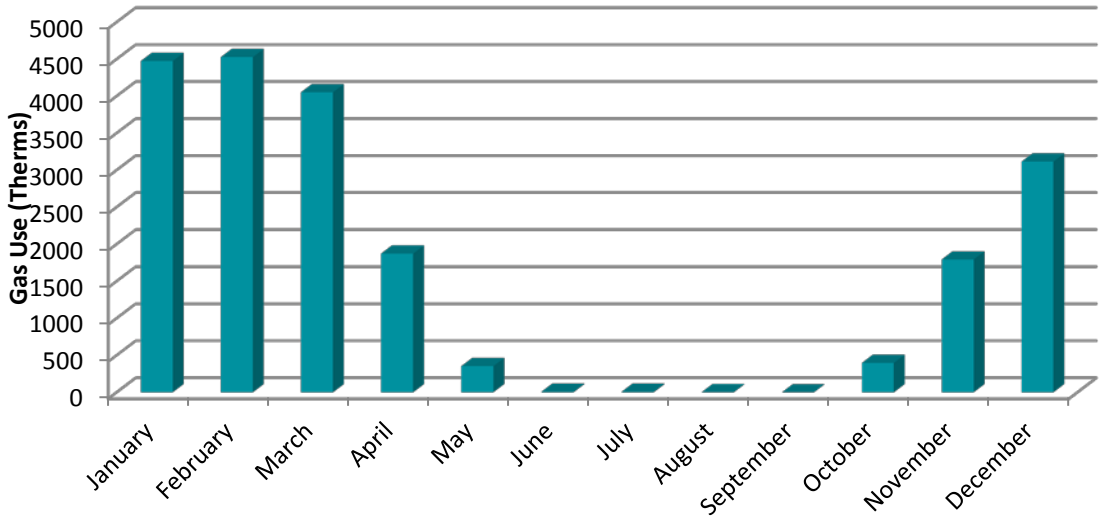
Table 3.2-11: Administration Building Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	79
Winter	55

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-21 illustrates the monthly average natural gas consumption at Administration Building from August, 2014 through August, 2015.

Figure 3.2-21: Administration Building Gas Usage



3.2.12 Kehler Stadium Field House

Electric power for Kehler Stadium Field House is fed from one General Service Secondary three phase line from PSE&G. Figure 3.2-22 illustrates the average monthly total energy consumption from August, 2014 through August, 2015.

From this graph, it can be determined that the average electrical consumption for Kehler Stadium Field House is approximately 3,000 kWh/month.

Table 3.2-12 illustrates the seasonal peak electrical demand loads for Kehler Stadium Field House from August, 2014 through August, 2015. The information presented is only as recent as the most recent bill received.

Figure 3.2-22: Kehler Stadium Field House Electricity Usage

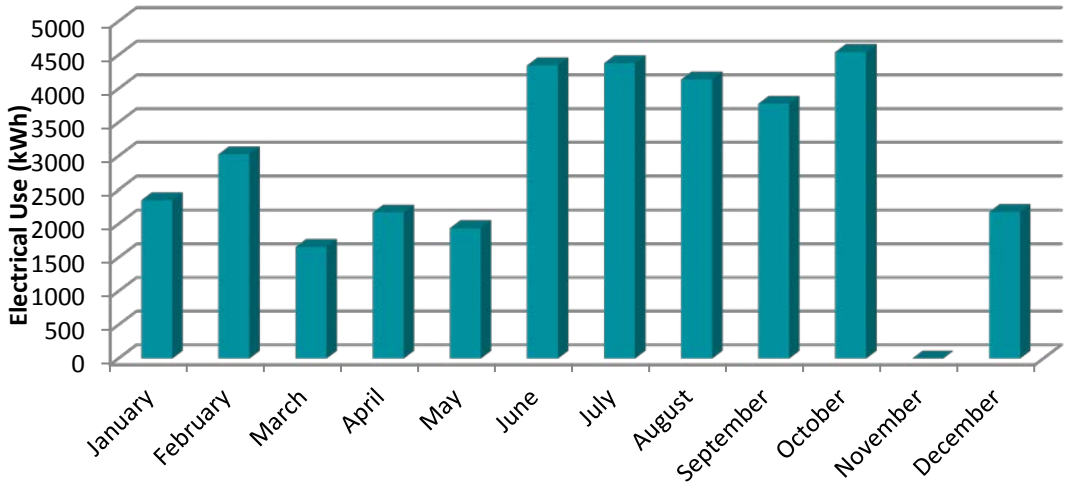


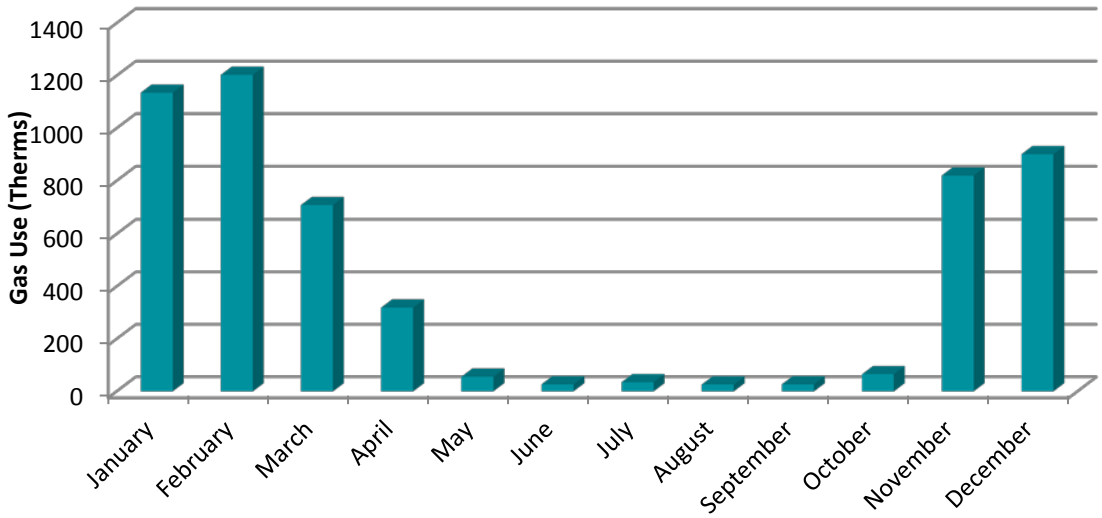
Table 3.2-12: Kehler Stadium Field House Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	14
Winter	23

Refer to Table 3.3-1, in Section 3.3 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2-23 illustrates the monthly average natural gas consumption at Kehler Stadium Field House from August, 2014 through August, 2015.

Figure 3.2-23: Kehler Stadium Field House Gas Usage



3.3 Aggregate Costs

For the purposes of computing energy savings for all identified energy conservation and retrofit measures, aggregate unit costs for electrical energy and fuel, in terms of cost/kWh and cost/therm, were determined for each service location and utilized in the simple payback analyses discussed in subsequent sections. The aggregate unit cost accounts for all distribution and supply charges for each location, unless otherwise noted.

Table 3.3-1 and Table 3.3-2 summarize the aggregate costs for electrical energy consumption and therms utilized, respectively.

Table 3.3-1: Electrical Aggregate Unit Costs

Service Location	Aggregate $ / kW-hr
Westfield High School	$0.18
Edison Intermediate School	$0.16
Roosevelt Intermediate School	$0.18
Franklin Elementary School	$0.19
Jefferson Elementary School	$0.18
Lincoln Elementary School	$0.18
McKinley Elementary School	$0.17
Tamaques Elementary School	$0.18
Washington Elementary School	$0.19
Wilson Elementary School	$0.19
Administration Building	$0.18
Kehler Stadium Field House	$0.18

Table 3.3-2: Natural Gas Aggregate Unit Costs

Service Location	Aggregate $ / therm
Westfield High School	$0.88
Edison Intermediate School	$1.04
Roosevelt Intermediate School	$0.92
Franklin Elementary School	$0.86
Jefferson Elementary School	$0.95
Lincoln Elementary School	$0.91
McKinley Elementary School	$0.90
Tamaques Elementary School	$0.91
Washington Elementary School	$1.43
Wilson Elementary School	$0.84
Administration Building	$0.83
Kehler Stadium Field House	$0.94

3.4 Portfolio Manager

3.4.1 Portfolio Manager Overview

Portfolio Manager is an interactive energy management tool that allows the Board to track and assess energy consumption at the facilities in a secure online environment. Portfolio Manager can help the Board set investment priorities, verify efficiency improvements, and receive EPA recognition for superior energy performance.

3.4.2 Energy Performance Rating

For many facilities, you can rate their energy performance on a scale of 1–100 relative to similar facilities nationwide. Your facility is *not* compared to the other facilities entered into Portfolio Manager to determine your ENERGY STAR rating.

Instead, statistically representative models are used to compare your facility against similar facilities from a national survey conducted by the Department of Energy's Energy Information Administration.

This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), is conducted every four years.

This survey gathers data on building characteristics and energy use from thousands of facilities across the United States. Your facility's peer group of comparison is those facilities in the CBECS survey that have similar facility and operating characteristics. A rating of 50 indicates that the facility, from an energy consumption standpoint, performs better than 50% of all similar facilities nationwide. A rating of 75 indicates that the facility performs better than 75% of all similar facilities nationwide.

3.4.3 Portfolio Manager Account Information

A Portfolio Manager account has been established for the Board, which includes a profile for the 12 buildings. Information entered into this Portfolio Manager Facility profile, including electrical energy consumption and natural gas consumption has been used to establish a performance baseline.

It is recommended that the information be updated to track the buildings' energy usage. Ratings shown below are based on the 12 month period for which utility data was available. None of these 12 buildings were eligible for an energy star label. Ratings were given for one all of the 12 buildings. Results are a reflection of the information supplied, if more recent information is entered into the Portfolio Manager account, there is a possibility for better results.

Westfield High School:	85
Edison Intermediate School:	96
Roosevelt Intermediate School:	85
Franklin Elementary School:	95
Jefferson Elementary School:	N/A*
Lincoln Elementary School:	64
McKinley Elementary School:	95
Tamaques Elementary School:	99
Washington Elementary School:	99
Wilson Elementary School:	N/A*
Administration Building:	99
Kehler Stadium Field House:	50

*The following buildings are missing utility data. Portfolio Manager requires 12 months of utility data in order to provide the EUI rating.

The following website link, username and password shall be used to access the Portfolio Manager account and building profiles that has been established for the Board:

https://www.energystar.gov/istar/pmpam/

USERNAME: dowdcj

Section 4

Section 4
Energy Conservation and Retrofit Measures (ECRM)

The following is a summary of how Annual Return on Investment (AROI), Internal Rate of Return (IRR), and Net Present Value (NPV) will be broken down in the cost analysis for all ECRMs recommended in this report.

Included in the simplified payback analysis summary table is the 'Annual Return on Investment' (AROI) values. This value is a performance measure used to evaluate the efficiency of an investment and is calculated using the following equation:

$$AROI = \frac{AECS + OCS}{NET\ ECM\ Cost} - \frac{1}{Lifetime}$$

Where OCS = Operating Cost Savings, and AECS = Annual Energy Cost Savings.

Also included in the table are net present values for each option. The NPV calculates the present value of an investment's future cash flows based on the time value of money, which is accounted for by a discount rate (DR) (assume bond rate of 3%). NPV is calculated using the following equation:

$$NPV = \sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$$

Where C_n=Annual cash flow, and N = number of years.

The Internal Rate of Return (IRR) expresses an annual rate that results in a break-even point for the investment. If the Board is currently experiencing a lower return on their capital than the IRR, the project is financially advantageous. This measure also allows the Board to compare ECRM's against each other to determine the most appealing choices.

$$IRR \rightarrow 0 = \sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$$

Where C_n=Annual cash flow, and N = number of years.

The lifetime energy savings represents the cumulative energy savings over the assumed life of the ECRM. As noted in previous sections of this report, CDM Smith bases a recommendation solely on a measure's calculated simple payback. The metrics defined above (IRR, NPV, AROI) are included as part of the scope of this audit, and for the Board's consideration as additional financial metrics to consider when deciding whether or not to pursue a specific measure that has been evaluated in this report.

4.1 Building Lighting Systems

The goal of this section is to present any lighting energy conservation measures that may also be cost beneficial. It should be noted that replacing current bulbs with more energy-efficient equivalents will have a small effect on the building heating and cooling loads. The building cooling load will see a small decrease from an upgrade to more efficient bulbs and the heating load will see a small increase, as the more energy efficient bulbs give off less heat.

For all of the buildings, it was noted there were existing interior occupancy sensors installed. Installing occupancy sensors in rooms where there are none will typically increase energy savings. If the space is not occupied or illuminated there will be little savings by installing occupancy sensors. No specific spaces have been identified for installation of occupancy sensors. Occupancy sensors should be installed as needed to reduce on time in unoccupied spaces.

Please note that the Engineer's Estimate of Probable Construction Costs presented herein are estimates based on historic data compiled from similar installations and engineering opinions. Additional engineering will be required for each measure identified in this report. Final scope of work and budget cost estimates will need to be confirmed prior to the coordination of project financing or the issuance of a Request for Proposal.

The following Table 4.1-1 summarizes a simple payback analysis assuming the implementation of all lighting system improvements at all of the Board's facilities included in this energy audit. Maintenance cost savings (MCS) are also included.

Incentives included in the analyses provided in Table 4.1-1 are taken from the New Jersey Clean Energy SmartStart Prescriptive Lighting Application and Worksheet, a copy of which can be found in Appendix F of this report. These forms may also be downloaded directly from:

http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/application-forms/regular-forms/regular-forms

Table 4.1-1
Lighting Upgrades

Location	Base Cost	Incentives	Total Cost	Energy Savings	Annual Savings	Simple Payback	MCS	AROI	IRR	NPV	Lifetime Savings
Westfield High School	$844,265	$40,005.0	$804,260	$66,790	$86,270	9.3	$19,481	4.1%	9.4%	$452,103	$1,604,534
Edison Intermediate School	$325,253	$13,155.0	$312,098	$22,693	$30,023	10.4	$7,330	3.0%	7.7%	$125,124	$558,388
Roosevelt Intermediate School	$97,637	$4,380.0	$93,257	$8,705	$11,083	8.4	$2,379	5.2%	11.0%	$68,151	$206,138
Franklin Elementary School	$104,903	$4,795.0	$100,108	$7,917	$9,909	10.1	$1,992	3.2%	8.1%	$44,192	$184,290
Jefferson Elementary School	$378,346	$17,090.0	$361,256	$23,555	$31,159	11.6	$7,604	2.0%	6.1%	$92,512	$579,518
Lincoln Elementary School	$150,878	$6,920.0	$143,958	$10,995	$14,243	10.1	$3,248	3.2%	8.1%	$44,192	$264,902
McKinley Elementary School	$81,105	$3,290.0	$77,815	$5,604	$7,200	10.8	$1,596	2.6%	7.1%	$27,045	$133,920
Tamaques Elementary School	$33,297	$1,345.0	$31,952	$1,889	$2,552	12.5	$663	1.3%	5.0%	$5,211	$47,462
Washington Elementary School	$159,042	$6,525.0	$152,517	$9,452	$12,697	12.0	$3,245	1.7%	5.6%	$32,393	$236,153
Wilson Elementary School	$172,664	$8,545.0	$164,119	$13,129	$16,491	10.0	$3,362	3.4%	8.3%	$76,043	$306,717
Administration Building	$127,892	$5,575.0	$122,317	$8,363	$11,083	11.0	$2,720	2.4%	6.8%	$39,087	$206,133
Kehler Stadium Field House	$112,816	$5,325.0	$107,491	$1,421	$4,525	23.8	$3,104	(2.5%)	(2.7%)	($41,588)	$84,166

*Incentives may be available through the NJ Smart Start Buildings Custom Measures or other programs which would improve the financial results of these measures.
MCS: Maintenance Cost Savings which includes labor and bulb costs for replacing bulbs at the end of service

4.2 HVAC Systems

The goal of this section is to present any heating and cooling energy reduction and cost saving measures that may also be cost beneficial. Where possible, measures will be presented with a life-cycle cost analysis. This analysis displays a payback period based on weighing the capital cost of the measure against predicted annual fiscal savings. To do this, the buildings have been modeled as accurately as possible to predict energy usage for space heating and cooling, as well as domestic hot water use.

The measures for these buildings were done with spreadsheet analysis. The weather dependent measures such as heating and envelope were modelled using bin hours for the weather data. These models were calibrated, using historical utility bills, to predict the impact of theoretical energy savings measures. The remaining measures, such as domestic hot water heating, are evaluated using published indexes or other assumptions to approximate usage and savings.

Once annual energy savings from a particular measure have been predicted and the initial capital cost has been estimated, payback periods may be approximated. Equipment cost estimate calculations are provided in Appendix H.

A detailed inventory of HVAC equipment observed at the facilities is included in Appendix J of this report. Along with basic equipment information such as manufacturers, model numbers, and estimated efficiencies, this inventory also seeks to provide an estimate of equipment remaining useful service life. For each piece of equipment, a known or estimated age is provided alongside the ASHRAE expected service life for that type of equipment. From this, an estimated remaining useful service life can be deduced. In some cases, service locations may have been estimated based on unit proximity. Additionally, in cases where a unit's manufacturer and/or model could not be determined due to an unreadable, faded, destroyed, or lost tag, manufacturer and model number information has been represented as "unknown".

Incentives included in HVAC ECRM analyses are taken from the New Jersey Clean Energy SmartStart program. A listing of the incentives available may be found in the application worksheets included in Appendix F of this report. These forms may also be downloaded directly from:

http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/application-forms/regular-forms/regular-forms

4.2.1 Westfield High School

Steam Boiler Upgrade

The building heating systems are from 1983. A model has been created for the Westfield High School. The model uses bin hour weather data to calculate the heating usage of the building systems.

Heating appliances decrease combustion efficiency over time. Equipment degrades even with proper maintenance and cleaning. The heat exchange surface deteriorates on both sides overtime. These boilers are nearing the end of their expected service lives and the efficiency is assumed to have decreased to 70%.

This measure involves replacing the existing boilers with new premium efficiency steam boilers. These boilers shall be of the same capacity and at least 83% efficient.

Table 4.2-1: Westfield High School Boiler Upgrade

Predicted Annual Savings (therms)	15,317 therms
Total Annual Savings	$13,174
Initial Capital Cost of Upgrade	$447,429

Incentives	$24,500
Cost of Upgrade	$422,929
Annual Maintenance Cost Savings (AMCS)	$6,000
Simple Payback	19.3
IRR	3.21%
NPV	$10,271
Lifetime Savings	$627,220

4.2.2 Roosevelt Intermediate School

Steam Boiler Upgrade

The building heating systems are from 1960. A model has been created for the Roosevelt Intermediate School. The model uses bin hour weather data to calculate the heating usage of the building systems.

Heating appliances decrease combustion efficiency over time. Equipment degrades even with proper maintenance and cleaning. The heat exchange surface deteriorates on both sides overtime. These boilers are nearing the end of their expected service lives and the efficiency is assumed to have decreased to 70%.

This measure involves replacing the existing boilers with new premium efficiency steam boilers. These boilers shall be of the same capacity and at least 83% efficient.

Table 4.2-1: Roosevelt Intermediate School Boiler Upgrade

Predicted Annual Savings (therms)	6,156 therms
Total Annual Savings	$11,295
Initial Capital Cost of Upgrade	$411,029
Incentives	$2,800
Cost of Upgrade	$408,229
Annual Maintenance Cost Savings (AMCS)	$6,000
Simple Payback	36.1
IRR	-14.27%
NPV	($336,149)
Lifetime Savings	$161,072

4.2.3 Franklin Elementary School

No HVAC measures were identified for Franklin Elementary School.

4.2.4 Jefferson Elementary School

Steam Boiler Upgrade

The building heating systems are from 1953. A model has been created for the Jefferson Elementary School. The model uses bin hour weather data to calculate the heating usage of the building systems.

Heating appliances decrease combustion efficiency over time. Equipment degrades even with proper maintenance and cleaning. The heat exchange surface deteriorates on both sides overtime. These boilers are nearing the end of their expected service lives and the efficiency is assumed to have decreased to 70%.

This measure involves replacing the existing boilers with new premium efficiency steam boilers. These boilers shall be of the same capacity and at least 83% efficient.

Table 4.2-1: Jefferson Elementary School Boiler Upgrade

Predicted Annual Savings (therms)	3,765 therms
Total Annual Savings	$12,385
Initial Capital Cost of Upgrade	$102,852
Incentives	$1,400
Cost of Upgrade	$101,452
Annual Maintenance Cost Savings (AMCS)	$9,000
Simple Payback	8.2
IRR	11.84%
NPV	$121,633
Lifetime Savings	$318,979

4.2.5 Lincoln Elementary School

Facility was recently upgraded. No energy measures were identified for this facility.

4.2.6 McKinley School Building

Condensing Boiler Upgrade

The building heating boilers are about 20 years old. A model has been created for the McKinley Elementary School. The model uses bin hour weather data to calculate the heating usage of the building systems.

Heating appliances decrease combustion efficiency over time. Equipment degrades even with proper maintenance and cleaning. The heat exchange surface deteriorates on both sides overtime. These boilers are nearing the end of their expected service lives and the efficiency is assumed to have decreased to 70%.

Condensing heating appliances increase combustion efficiency by removing more energy from the combustion gas. The additional energy reduces the combustion gas temperature which causes the water vapor produced by combustion to condense to liquid. The condensation occurs in the boiler and the stack, which requires the boiler and venting to be tolerant and able to drain the liquid.

This measure involves replacing the existing steam boilers and hot water converters with new premium efficiency condensing boilers. These boilers shall be of the same capacity and at least 92% efficient.

Table 4.2-1: McKinley Elementary School Boiler Upgrade

Predicted Annual Savings (therms)	5,796 therms
Total Annual Savings	$8,482
Initial Capital Cost of Upgrade	$37,477
Incentives	$4,000
Cost of Upgrade	$33,477
Annual Maintenance Cost Savings (AMCS)	$3,000
Simple Payback	3.9
IRR	16.00%
NPV	$41,155
Lifetime Savings	$166,775

4.2.7 Washington Elementary School

DHW Upgrade

The domestic hot water in the building is generated by a gas fired, atmospheric combustion storage water heater. The heater is assumed to be 80% efficient.

Condensing heating appliances increase combustion efficiency by removing more energy from the combustion gas. The additional energy reduces the combustion gas temperature which causes the water vapor produced by combustion to condense to liquid. The condensation occurs in the boiler and the stack, which requires the boiler and venting to be tolerant and able to drain the liquid.

This measure involves generating the domestic hot water with a condensing heater. This could be accomplished by heating with a condensing space heating boiler or installing new condensing domestic water heater to replace the existing equipment. This measure is based upon installing a 95% efficient domestic water heater in the Washington Elementary School that is properly sized for the connected load.

Table 4.2-2: Washington Elementary School DHW Upgrade

Predicted Annual Savings (therms)	615 therms
Total Annual Savings	$582
Initial Capital Cost of Upgrade	$2,487
Incentives	$50
Cost of Upgrade	$2,437
Annual Maintenance Cost Savings (AMCS)	$0
Simple Payback	4.2

4.2.8 Kehler Stadium Field House

Steam Boiler Upgrade

The building heating systems are from 1995. A model has been created for the Kehler Stadium Field House. The model uses bin hour weather data to calculate the heating usage of the building systems.

Heating appliances decrease combustion efficiency over time. Equipment degrades even with proper maintenance and cleaning. The heat exchange surface deteriorates on both sides overtime. These boilers are nearing the end of their expected service lives and the efficiency is assumed to have decreased to 70%.

This measure involves replacing the existing boilers with new premium efficiency steam boilers. These boilers shall be of the same capacity and at least 83% efficient.

Table 4.2-1: Kehler Stadium Field House Boiler Upgrade

Predicted Annual Savings (therms)	3,765 therms
Total Annual Savings	$3,311
Initial Capital Cost of Upgrade	$41,317
Incentives	$175
Cost of Upgrade	$41,142
Annual Maintenance Cost Savings (AMCS)	$3,000
Simple Payback	12.4
IRR	6.31%
NPV	$16,153
Lifetime Savings	$81,455

4.2.9 Combined Heat and Power

CHP Screening

When using thermal energy and electrical energy coincidentally, it can be cost effective to produce both on site instead of purchasing them from the grid. Commonly the grid power producers use similar technologies to produce electricity but nominally waste the thermal energy produced. Sites with coincidental and continuous need for electrical and thermal energy can produce a base load of both energies.

This measure involves installing a device that will consume natural gas and produce electrical and thermal energy. These yields are typical for 65 kW devices such as a micro turbine or engine generator. The savings of this system is approximated by the following screening. Buildings with average electrical demands of at least twice the unit rated electrical capacity are presumed to have a majority of hours. The detailed calculations are included in Appendix C.

School	Electric			Gas		
	kWh	kW (avg)	$	Therms	MBH (avg)	$
*Westfield High School	1,261,778	144	$227,120	99,843	1,140	$87,862
Edison Intermediate School	437,077	50	$69,932	30,731	351	$31,960
Roosevelt Intermediate School	566,412	65	$101,954	47,105	538	$43,337
Franklin Elementary School	193,479	22	$36,761	28,980	331	$24,923
Jefferson Elementary School	175,337	20	$31,561	28,250	322	$26,838
Lincoln Elementary School	289,160	33	$52,049	8,616	98	$7,841
McKinley Elementary School	169,030	19	$28,735	28,379	324	$25,541
Tamaques Elementary School	173,409	20	$31,214	10,158	116	$9,244
Washington Elementary School	153,766	18	$29,216	12,856	147	$18,384
Wilson Elementary School	176,446	20	$33,525	26,263	300	$22,061
Administration Building	153,480	18	$27,626	20,615	235	$17,110
Kehler Stadium Field House	34,842	4	$6,272	3,271	37	$3,075
*Site utility usage appears to be a good candidate for combined heat and power.						

The cost effectiveness has only been evaluated for the schools that pass the preliminary screening. Also, the gas rates established from the provided fuel bills were significantly less than typically observed for schools in New Jersey. It is assumed to be due to a third party energy supplier. Confirm natural gas costs before pursuing further investigation.

Facility	Total Cost	Energy Savings	Incentive	Annual Fiscal Savings[2]	Simple Payback (Years)
Westfield High School	$143,000	-36,374 therms 280,800 kWh 594,000 kbtuh	$42,900	$26,851	4.12

The evaluations shows that the High School would actually increase cost and the Middle school would have a payback near the expected equipment life of the system. This measure is not recommended due to the long payback. Correcting gas cost could show the measure as more favorable.

4.2.10 Building Management System

Currently many HVAC systems at the buildings have pneumatic controls. Some buildings have partially functioning pneumatic controls, while others may have abandoned or bypassed the pneumatics. Some of the buildings have Automated Logic thermostats in rooms and have attempted to have full electronic control. It was stated during a meeting that the control system throughout the schools in the District were never fully installed or operational. It is assumed that all the buildings with this measure recommended have limited or no operable automatic HVAC controls.

It is recommended that a direct digital control (DDC) building management system (BMS) be implemented. A system like this would monitor and control all HVAC equipment, allowing maintenance staff to operate systems and adjust climate control in real time to maximize staff and customer comfort, while minimizing unnecessary heating and cooling.

Typically implementation of a BMS will save the owner 5-15% of the energy devoted to HVAC. Systems are currently independently monitored and controlled. CDM Smith conservatively estimates that incorporating the remaining HVAC equipment into the DDC BMS will allow the buildings to save on average, 10% of the energy being used for HVAC.

This measure involves installing a DDC control system which will measure the space temperature of all the spaces, and control the heating and cooling equipment. The system will be able to vary the operation of the unit, outdoor air damper, space temperature set points, air conditioning systems (if applicable), boiler, and zone pumps (if applicable) based upon outdoor air temperature and building occupancy. This will include building start up staging, and outdoor temperature shut down and alarms for low building temperature or no heat.

A centralized building management system can incorporate real time energy monitoring for all HVAC systems, allowing the board to see exactly how much energy is being used to heat and/or cool the building at any time throughout the year. It can also incorporate staging air conditioning and heating units to reduce the building peak electrical and gas demand. The building management system can also be capable of relaying information a central control system for all buildings. This will allow a single point or person to oversee the energy use throughout the district.

CDM Smith was not able to locate any available grants or incentives for consolidating systems and switching to DDC. Despite this, however, this change still offers an attractive payback and is therefore recommended by CDM Smith.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.2-2. Savings are estimated to be 10% of the total ventilation, pump (if applicable), heating and cooling usage. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing a building management system.

Facility	Total Cost	Energy Savings		Annual Fiscal Savings	Simple Payback (Years)
Westfield High School	$ 302,300	25,236 kWh	1,997 therms	$ 6,393	47.3
Edison Intermediate School	$ 124,900	8,742 kWh	615 therms	$ 2,068	60.4
Roosevelt Intermediate School	$ 112,900	11,328 kWh	942 therms	$ 2,913	38.8
Franklin Elementary School	$ 65,800	3,8790 kWh	580 therms	$ 1,234	53.3
Jefferson Elementary School	$ 47,850	3,507 kWh	565 therms	$ 1,160	41.3
McKinley Elementary School	$ 61,140	3,381 kWh	568 therms	$ 1,142	53.5
Tamaques Elementary School	$ 48,350	3,468 kWh	203 therms	$ 822	58.8
Wilson Elementary School	$ 121,469	3,529 kWh	525 therms	$ 1,110	109.4
Administration Building	$ 60,000	3.070 kWh	412 therms	$ 893	67.2

4.3 Energy Conservation and Reduction Measures

4.3.1 Window Upgrade

The existing building windows are typically replacments and almost exclusively double pane windows. The windows are in fair condition. The existing windows are presumed to have a u-value of 1.0.

New windows with insulated glass, thermal break in frame, and low e-coatings help to reduce the heating and cooling loads of the space. The evaluated replacement windows have a u-value of 0.35.

This measure involves replacing windows with aluminum frame, double pane, argon filled, and low-e glazing with a u-value of 0.35 or less. This measure is not recommended due to the long paybacks.

Window Upgrade Energy Savings Summary

Facility	Total Cost	Energy Savings	Annual Fiscal Savings2	Simple Payback (Years)
Administration Building	$236,896	2,358 therms	$2,064	**114.8**

4.3.2 Photovoltaic Solar Energy System Overview

Photovoltaic (PV) cells convert energy in sunlight directly into electrical energy through the use of silicon semiconductors, diodes and collection grids.

Several PV cells are then linked together in a single frame of module to become a solar panel. PV cells are able to convert the energy from the sun into electricity. The angle of inclination of the PV cells, the amount of sunlight available, the orientation of the panels, the amount of physical space available and the efficiency of the individual panels are all factors that affect the amount of electricity that is generated.

Based on the estimated cumulative total available roof area, calculations determine that the installation of 12 systems with a total rating of approximately 1205 kW (dc) will be appropriate for the Board's buildings listed below.

As part of this energy audit, a preliminary engineering feasibility study of the sites outlined above to support solar generation facilities was completed consisting of the following tasks:

a. Site visit by CDM Smith engineers
b. Satellite Image Analysis and Conceptual design and layout of the photovoltaic system
c. Design and construction cost estimates
d. Determine a preliminary design for the size and energy production of the solar system

The total unobstructed available area of each section of the roof with southern exposure was evaluated. **It is important to note that the structural integrity of the roofs was not confirmed during CDM Smith's site visit; therefore, buildings may require some degree of roof reinforcing work prior to the implementation of a roof mounted solar system.**

In the case of the flat areas, the PV system sizing and kWh production was calculated assuming the installation of a crystalline module facing south direction (180 Degree Azimuth) and tilted approximately 15 degrees to allow better rain water shedding and snow melting. Please note that the kWh production as well as system size may differ significantly based on final panel tilt selected during the RFP and design phase.

Blended electric rates were used based on actual utility bills and were applied for the buildings.

The following is a preliminary study on the feasibility of installing PV solar systems at the 12 Board buildings to generate a portion of each facility's electricity requirements. Each system is designed to offset the electric purchased from the local utility and not as a backup or emergency source of power.

In order to determine the best location for the installation of the PV solar system, a satellite image analysis and site walkthrough of the buildings was performed during August 2015. As per the Scope of Work, only the building roofs were considered for PV installation.

Also, as part of the assessment, CDM Smith investigated possible locations for electrical equipment that need to be installed such as combiner boxes, disconnect switches and DC to AC inverters. Consideration was also given to locations of interconnection between the solar system and building's electrical grid.

Table 4.3-1 provides a summary of all proposed roof mounted PV systems for the Board. The Project Team conducted facility walkthroughs and utilized satellite image analysis and to determine the estimated total available area, then calculated the potential capacity of a solar array system for each location.

It should be noted that the interconnection point for the PV system will require a modification or replacement of the existing service entrance equipment wherein the PV system feeder connections will have to be made after the main circuit breaker, and protective relaying will also have to be implemented. Any connection points would have to meet NEC and local utility requirements.

Further investigation and verification of existing electrical equipment at each location would be required prior to implementation of a PV system. See Section 2 for a detailed description of each building's roof type.

Table 4.3-1: Proposed Solar System Summary

Location	Roof Type	Proposed PV Array Size (kW DC)
Westfield High School	Flat	200
Edison Intermediate School	Flat	75
Roosevelt Intermediate School	Flat	150
Franklin Elementary School	Flat	200

Jefferson Elementary School	Flat	150
Lincoln Elementary School	Flat	100
McKinley Elementary School	Flat	75
Tamaques Elementary School	Flat	100
Washington Elementary School	Flat	50
Wilson Elementary School	Flat	50
Administration Building	Flat	50
Kehler Stadium Field House	Flat	5

4.3.2.1 Basis for Design and Calculations

The proposed Photovoltaic (PV) Power systems outlined above for each facility are comprised of the PV arrays, inverter(s), combiner boxes, disconnect switches, and all of the necessary wiring and interconnection equipment. The solar panels will be mounted onto the roof. The array outputs will feed power into the DC to AC inverters. AC outputs will then be connected at each building's electrical service as outlined above. Pending further engineering analysis of the roofs, it is yet to be determined if the solar arrays will be installed using a self-ballasting system, or roof penetration system, or a combination of both.

The most common roof mounted system is referred to as a ("fixed tilt") system typically mounted to a metal rack that can be fixed at a specific angle. There are also ("tracking systems") or movable along one or two axes to follow the position of the sun during the day. For a roof-mounted PV system, tracking systems are very rarely installed and are usually used for ground-mounted systems only, as they require more complex racks and higher maintenance costs. For the "fixed" system, the tilt is determined based on the following factors: geographical location, total targeted kWh production, seasonal electricity requirements and weather conditions such as wind.

Ideally, the module tilt for Central to Eastern New Jersey should be 25-35 degrees with an azimuth as close as possible to 180 (south); however, experience has shown that PV systems typically installed at a tilt of 20 degrees or lower to avoid any issues with wind and maximize total system size

The type of PV panels and equipment used to mount the system shall be determined based on the wind conditions and structural integrity of the roof determined during the design phase of the project. In general, penetration/tie-down systems, non-penetrating ballasted type systems, or a combination of the two should be considered.

4.3.2.2 Calculation of PV System Yield

An industry accepted software package PV Watts was used to calculate projected annual electrical production of the crystalline silicon PV system in its first year.

Results of this calculation are summarized in Table 4.3-2. The PV systems were designed to provide maximum kWh production based on available roof space. Existing available roof space was utilized to determine a capacity, or size.

Table 4.3-2: Summary of Solar (PV) Systems

Building	Simple Payback	Size (kW DC)	kWh Production	Energy Savings	SREC*	AROI	IRR	NPV	Lifetime Savings (25 Years)
Westfield High School	19.9	**200**	237,800	$42,804	$43,410.39	1.01%	1.86%	($193,291)	$1,560,602
Edison Intermediate School	23.9	**75**	89,175	$14,268	$16,278.90	0.18%	0.15%	($191,397)	$ 520,201
Roosevelt Intermediate School	20.5	**150**	178,350	$32,103	$32,557.79	0.89%	1.64%	($176,218)	$1,170,452
Franklin Elementary School	19.4	**200**	237,800	$45,182	$43,410.39	1.16%	2.19%	($138,906)	$1,647,302
Jefferson Elementary School	20.5	**150**	178,350	$32,103	$32,557.79	0.89%	1.64%	($176,218)	$1,170,452
Lincoln Elementary School	21.5	**100**	118,900	$21,402	$21,705.20	0.65%	1.22%	($159,145)	$ 780,301
McKinley Elementary School	23.2	**75**	89,175	$15,160	$16,278.90	0.31%	0.50%	($171,003)	$ 552,713
Tamaques Elementary School	21.5	**100**	118,900	$21,402	$21,705.20	0.65%	1.22%	($159,145)	$ 780,301
Washington Elementary School	23.9	**50**	59,450	$11,296	$10,852.60	0.19%	0.43%	($128,477)	$ 411,826
Wilson Elementary School	23.9	**50**	59,450	$11,296	$10,852.60	0.19%	0.43%	($128,477)	$ 411,826
Administration Building	24.6	**50**	59,450	$10,701	$10,852.60	0.07%	0.12%	($142,073)	$ 390,151

Due to the high initial capital cost and relatively long calculated payback, CDM Smith does not recommend that the Board directly incur the cost of photovoltaic system installations at their facilities. As an alternative, the Board may consider consulting a Special Purpose Company (SPC) to fund the installation of these systems through a power purchase agreement (PPA). PPAs and SPCs are further discussed in Section 7 of this report.

4.3.3 On-Site Wind Power Generation

On-site wind power generation typically utilizes a form of turbine, which is rotated with the flow of wind across it, this rotational force powers a generator, producing DC electricity. The DC electricity is then converted into AC electricity, which can be used for commercial power, or can be fed back into the power grid, reducing the overall electric demand. The size of the turbine is proportional to the amount of wind and concurrently the amount of energy it can produce. An ideal location for a wind turbine is 20 feet above any surrounding object within a 250 foot radius. In general this relates to a property size of one acre or more.

Utilizing NASA's online wind mapping tool, it was determined that the local average wind speeds in Westfield, nearby Newark, is 7 mph. In general, around 9 mph of average wind speed, as determined over the course of a year, is necessary to "fuel" the turbine. These values fall below the range of feasibility for installation of a new wind turbine system. The NREL, national renewable energy laboratories, have rated this are of New Jersey at a level below "fair for wind energy production.

For the purposes of this feasibility analysis, CDM Smith chose a 35 kW wind turbine. This turbine size is used most often for small commercial applications. Power Curve data was determined through the use of the product specification sheets on vendor websites, and vendor provided tools. Actual turbine size, height, location, and manufacturer should be determined upon design of a wind turbine system.

The estimated wind speed data, associated wind probability distribution function (weibull value), turbulence losses, and other relevant data were then incorporated into the Wind Cad Modeling spreadsheet to estimate the annual output for the wind turbine. Refer to Appendix C for Wind Cad Modeling.

Table 4.4-5 includes a simple payback analysis for the installation of a wind turbine energy system on the most desirable site. Refer to Appendix C for a more detailed wind turbine financing spreadsheet, including utility cost avoidance and REC's.

Table 4.4-5
Simple Payback Analysis for Wind Turbine Energy System

Parameter	Wind Turbine
Annual Return On Investment (AROI)	-1.90%
Lifetime Energy Savings (15 years)	$242,915
Internal Rate of Return (IRR)	2.12%
Net Present Value (NPV)	$-13,046

*Refer to Appendix C for Wind Cad Modeling

Based on the simple payback model, summarized in Table 4.4-5, the wind power has minimal cost savings of the life of the equipment. If the New Jersey begins offering wind energy incentives, the Board could re-evaluate specific locations and incentives. Also, the technology is constantly changing and will most likely continue to lower in price.

It should be noted that CDM Smith used only REC values, utility cost avoidance factors, and the REIP incentive in determining simple payback periods. As stated above, other incentives and financial programs such as Power Purchase Agreements are available to help finance this installation. For example, if a Power Purchase Agreement is completed, the private company financing the project would benefit from the 30% tax credit. Other incentives such as CREB's and first year usage incentives could be available to the Board in lowering the payback period. Refer to *www.dsireusa.org* for an extensive listing of possible incentives for the New Jersey area.

It should also be noted that the wind turbine represented above is for feasibility purposes only. If the Board decides to install a wind turbine, different mounting heights, turbine sizes, and manufacturers should be considered. In addition, permits may be required for installation according to local zoning laws. The FAA must also be notified in order to give clearance for the tower, and for installation of aviation safety lights if necessary.

Section 5

Section 5
Evaluation of Energy Purchasing and Procurement Strategies

5.1 Energy Deregulation

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law, the deregulation of the market, allowed all consumers to shop for their electric supplier. The intent was to create a competitive market for electrical energy supply. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third party supplier. Energy deregulation in New Jersey increased the energy buyers' options by separating the function of electricity distribution from that of electricity supply.

To sell electric generation service in New Jersey, electric power suppliers must be licensed by the New Jersey Board of Public Utilities (NJ BPU). They must also be registered with the local public utility (JCP&L/PSE&G) to sell electric service in that utility's service areas. The following suppliers are licensed with the NJ BPU and are registered to sell electric service in the PSE&G service territory:

- Abest Power & Gas of NJ, LLC
- AEP Energy, Inc.
- Alpha Gas & Electric, LLC
- Ambit Northeast, LLC (Ambit Energy)
- American Powernet Management, LP
- Amerigreen Energy, Inc.
- AP Gas & Electric, LLC
- Astral Energy, LLC
- Barclays Capital Services, Inc.
- BBPC, LLC (Eastern Energy)
- Blue Pilot Energy, LLC
- CCES LLC (Clean Currents Energy Services)
- Champion Energy Services, LLC
- Choice Energy, LLC
- Clearview Electric, Inc.

- Commerce Energy, Inc.
- Community Energy, Inc.
- ConEdison Solutions
- Constellation NewEnergy, Inc.
- Credit Suisse (USA) Inc.
- Direct Energy Business, LLC
- Discount Energy Group, LLC
- Dominion Retail, Inc.
- DTE Energy Supply, Inc.
- Energy.me Midwest, Inc.
- Energy Plus Holdings, LLC
- Ethical Electric Benefit Co. (Ethical Electric)
- Energy Service Providers (New Jersey Gas & Electric)
- FirstEnergy Solutions
- Gateway Energy Services Corp.
- GDF SUEZ Energy Resources NA, Inc.
- Glacial Energy of New Jersey, Inc.
- Global Energy Marketing LLC
- Green Mountain Energy Company
- Harborside Energy LLC
- Hess Corporation
- Hess Energy Marketing LLC
- Hess Small Business Services, LLC
- HIKO Energy, LLC
- HOP Energy LLC
- Hudson Energy Services, LLC
- IDT Energy, Inc.
- Independence Energy Group, LLC

- Integrys Energy Services, Inc.
- Keil & Sons, Inc (Systrum Energy)
- Liberty Power Delaware, LLC
- Liberty Power Holdings, LLC
- Linde Energy Services
- Marathon Power LLC
- MP2 Energy NJ, LLC
- Natures Current, LLC
- MPower Energy NJ LLC
- NATGASCO, Inc (Supreme Energy, Inc)
- NextEra Energy Services New Jersey, LLC
- Noble Americas Energy Solutions
- Nordic Energy Services, LLC
- North American Power & Gas, LLC
- North Eastern States, Inc. (Entrust Energy)
- Oasis Power, LLC (Oasis Energy)
- Palmco Power NJ, LLC
- Park Power, LLC
- Plymouth Rock Energy, LLC
- Power Management Co. (PMC Lightsavers Limited Liability Company)
- PPL Energy Plus, LLC
- Public Power & Utility of New Jersey, LLC
- Reliant Energy
- ResCom Energy LLC
- Respond Power LLC
- Save on Energy, LLC
- SJ Energy Partners, Inc.
- South Jersey Energy Company

- Sperian Energy Corp.
- Spark Energy, LP
- Sprague Energy Corp.
- Starion Energy PA Inc.
- Stream Energy New Jersey, LLC
- Texas Retail Energy, LLC
- TransCanada Power Marketing Ltd.
- TriEagle Energy, LP
- UGI Energy Services Inc.
- Verde Energy USA, Inc.
- Viridian Energy
- Xoom Energy New Jersey, LLC
- YEP Energy
- Your Energy Holdings, LLC

The Board may also be able to purchase aggregate energy through the Government Energy Aggregation Act (GEA) of 2003. This is a process where a third party contract administrator solicits third party energy supplier quotes for aggregate blocks of energy at lower costs. This option is typically more feasible for large energy users (such as Water and Wastewater Treatment Plants) and for large municipalities. The Board should do more research on this topic and determine if a partnership with another municipality would be an option to peruse.

5.2 Demand Response Program

Demand Response is a program through which a business can make money on reducing their electricity use when wholesale electricity prices are high or when heavy demand causes instability on the electric grid, which can result in voltage fluctuations or grid failure. Demand Response is an energy management program that compensates the participant for reducing their energy consumption at critical times. Demand Response is a highly efficient and cost effective means of reducing the potential for electrical grid failure and price volatility and is one of the best solutions to the Mid-Atlantic region's current energy challenges.

The program provides at least 2 hours advance notice before curtailment is required. There is typically 1 event a year that lasts about 3 hours in the summer months, when demand for electricity is at its highest.

Participation in Demand Response is generally done through companies known as Curtailment Service Providers, or CSPs, who are members of PJM Interconnection. There is no cost to enroll in the program and participation is voluntary, for instance, you can choose when you want to participate. In most cases, there is no penalty for declining to reduce your electricity use when you're asked to do so. The event is managed remotely by notifying your staff of the curtailment request and then enacting curtailment through your Building Management System.

CSPs will share in a percentage of your savings, which may differ among various CSPs, since there may be costs associated with the hardware and /or software required for participation, so it is recommended that a number of CSPs be contacted to review their offers.

Buildings with non-emergency services, and with high electrical usage during peak hours (typically mid-day to early afternoon), that can shut down portions of the building loads are ideal for the implementation of demand response.

Section 6

Section 6
Ranking of Energy Conservation and Retrofit Measures (ECRM)

6.1 ECRMs

The main objective of this energy audit is to identify potential Energy Conservation and Retrofit Measures and to determine whether or not the identified ECRM's are economically feasible to warrant the cost for planning and implementation of each measure. Economic feasibility of each identified measure was evaluated through a simple payback analysis. The simple payback analysis consists of establishing the Engineer's Opinion of Probable Construction Cost estimates; O&M cost savings estimates, projected annual energy savings estimates and the potential value of New Jersey Clean Energy Rebates or Renewable Energy Credits, if applicable. The simple payback period is then determined as the amount of time (years) until the energy savings associated with each measure amounts to the capital investment cost.

As discussed in Section 3, aggregate unit costs for electrical energy delivery and usage and natural gas delivery and usage, which accounts for all demand and tariff charges at each complex, was determined and utilized in the simple payback analyses.

In general, ECRMs having a payback period of 20 years or less have been recommended and only those recommended ECRMs within Section 4 of the report have been ranked for possible implementation. The most attractive rankings are those with the lowest simple payback period.

Ranking of ECRMs has been broken down into the following categories:

- Lighting Systems
- HVAC Systems
- Solar Systems
- Wind Systems

6.1.1 Lighting Systems

Table 6.1-1 includes the recommended ECRMs to provide energy savings for all building lighting systems, which include the installation of energy-efficient luminaires. A detailed discussion on building lighting systems is presented in Section 4.1.

Table 6.1-1

Ranking of Energy Savings Measures Summary – Lighting System Retrofits

Location	Base Cost	Incentives	Total Cost	Annual Savings	Simple Payback
Roosevelt Intermediate School	$97,637	$4,380	$93,257	$11,083	8.4
Westfield High School	$844,265	$40,005	$804,260	$86,270	9.3
Wilson Elementary School	$172,664	$8,545	$164,119	$16,491	10.0
Franklin Elementary School	$104,903	$4,795	$100,108	$9,909	10.1
Lincoln Elementary School	$150,878	$6,920	$143,958	$14,243	10.1
Edison Intermediate School	$325,253	$13,155	$312,098	$30,023	10.4
McKinley Elementary School	$81,105	$3,290	$77,815	$7,200	10.8
Administration Building	$127,892	$5,575	$122,317	$11,083	11.0
Jefferson Elementary School	$378,346	$17,090	$361,256	$31,159	11.6
Washington Elementary School	$159,042	$6,525	$152,517	$12,697	12.0
Tamaques Elementary School	$33,297	$1,345	$31,952	$2,552	12.5
Kehler Stadium Field House	$112,816	$5,325	$107,491	$4,525	23.8

6.1.2 HVAC Systems

Table 6.1-2 includes the recommended ECRM to provide energy savings for building HVAC systems, which provide a simple payback of less than 20 years. A detailed discussion on building HVAC systems is presented in Section 4.2.

Table 6.1-2

Ranking of Energy Savings Measures Summary – HVAC System Upgrade

Building Measure	Retrofit Cost	Incentives	Total Cost	Annual Fiscal Savings	Simple Payback (Years)
Washington Elementary School DHW	$	$50	$ 2,487	$529	**4.7**
McKinley Elementary School Condensing Boilers	$	$	$37,477	$2,445	**15.3**

6.1.3 Solar Energy

Implementation of new solar energy systems has been evaluated to determine the economic feasibility for furnishing and installing such systems. These facilities are either not cost effective or very close to not cost effective. Based solely on the simple payback modeling performed, it would not benefit the Board to further investigate installing the solar energy systems. However, other options such as Power Purchase Agreements (PPA) are potentially available to help finance the project. Therefore, if the Board is interested in installing additional solar energy systems at the various facilities, consultation with a special purpose company is recommended to obtain financing through a PPA. This is further discussed in Section 7.

Table 6.1-3, includes a ranking of the solar energy ECRMs evaluated for the Westfield Board of Education.

Table 6.1-3
Ranking of Energy Savings Measures Summary – Solar Energy Systems

Building	Retrofit Cost	Annual SREC Credit	Annual Fiscal Savings	Simple Payback (Years)
Westfield High School	$1,625,000	$ 43,410	$ 42,804	19.9
Edison Intermediate School	$ 687,500	$ 16,279	$ 14,268	23.9
Roosevelt Intermediate School	$1,250,000	$ 32,558	$ 32,103	20.5
Franklin Elementary School	$1,625,000	$ 43,410	$ 45,182	19.4
Jefferson Elementary School	$1,250,000	$ 32,558	$ 32,103	20.5
Lincoln Elementary School	$ 875,000	$ 21,705	$ 21,402	21.5
McKinley Elementary School	$ 687,500	$ 16,279	$ 15,160	23.2
Tamaques Elementary School	$ 875,000	$ 21,705	$ 21,402	21.5
Washington Elementary School	$ 500,000	$ 10,853	$ 11,296	23.9
Wilson Elementary School	$ 500,000	$ 10,853	$ 11,296	23.9
Administration Building	$ 500,000	$ 10,853	$ 10,701	24.6
Kehler Stadium Field House	$ 162,500	$ 1,085	$ 1,070	79.8

6.1.4 Wind Energy

Implementation of new wind energy systems has been evaluated to determine the economic feasibility for furnishing and installing such systems. Based on the simple payback modeling performed, it would benefit the Board to further investigate installing the wind energy systems. This is primarily based on the initial upfront capital investment required for a wind energy system installation and an acceptable payback period. Table 6.1-4, includes a ranking of the wind energy ECRMs evaluated for the Westfield Board of Education.

Table 6.1-4
Ranking of Energy Savings Measures Summary – Wind Turbine Energy System

Parameter	Wind Turbine (Average Site Wind Speed – 10 mph)
Engineer's Opinion of Probable Cost	$450,000
1st Year Production	138,608
Annual Estimated Electric Savings	$19,405
Annual Estimated REC Revenue	$1,247
Project Simple Payback	**23.2**

Section 7

Section 7
Grants, Incentives and Funding Sources

7.1 Renewable Energy

7.1.1 Renewable Energy Certificates (NJ BPU)

As part of New Jersey's Renewable Portfolio Standards (RPS), electric suppliers are required to have an annually-increasing percentage of their retail sales generated by renewable energy. Electric suppliers fulfill this obligation by purchasing renewable energy certificates (RECs) from the owners of solar generating systems. One REC is created for every 1,000 kWh (1 MWh) of renewable electricity generated. Although solar systems generate electricity and SRECs in tandem, the two are independent commodities and sold separately.

The RPS, and creation of RECs, is intended to provide additional revenue flow and financial support for renewable energy projects in New Jersey. Class I RECs, which include electricity generation from wind, wave, tidal, geothermal and sustainable biomass typically trade at around $0.90/MWh. RECs generated from solar electricity, or SRECs, have recently been trading between $63 - $510 per MWh, with the weighted average trade value at approximately $180-$200.

Photovoltaic array installations evaluated within this report would benefit from this program.

7.1.2 Renewable Energy Incentive Program (NJ BPU)

The Renewable Energy Incentive Program (REIP) is currently offering incentives for municipalities to invest in CHP systems through the Small and Large Scale Combined Heat and Power (CHP)/Fuel Cell Program. The existing small and large CHP-Fuel Cell programs will be combined to offer rolling grants to support CHP and fuel cell projects serving commercial, industrial, and institutional customers in New Jersey. There is a total of $50 million in grants available. The Large Scale CHP/Fuel Cell program is operated by the New Jersey BPU. Details on further qualifications, disbursement caps, and grant applications have not yet been released. Information on these details will be posted to the NJ BPU website. Other incentives are also available under this program, for more information on REIP, please see www.njcleanenergy.com.

7.1.3 Utility Financing Programs

All four Electric Distribution Companies (EDCs) in New Jersey have developed long term contracting or financing programs for the development of solar energy systems. In all of the programs, Solar Renewable Energy Credits (SRECs) generated by the solar energy systems will be sold at auction to energy suppliers who are required to purchase a certain quantity of SRECs to meet their Renewable Portfolio Standard requirements.

Photovoltaic array installations evaluated within this report would benefit from this program.

7.1.4 Renewable Energy Manufacturing Incentive (NJ BPU)

New Jersey's Renewable Energy Manufacturing Incentive (REMI) program provides rebates to purchase and install solar panels, inverters, and racking systems manufactured in New Jersey.

Rebates for panels start at $0.25 per watt and rebates for racking systems and inverters start at $0.15 per watt for solar projects up to 500 kW in capacity. To be eligible for REMI, applicants must apply to either the Renewable Energy Incentive Program (REIP) or the SREC Registration Program (SRP).

Photovoltaic array installations evaluated within this report may benefit from this program.

7.1.5 Clean Renewable Energy Bonds (IRS)

The IRS is currently not accepting application for CREBs. For more information, please refer to http://www.irs.gov/pub/irs-drop/a-10-54.pdf.

7.1.6 Qualified Energy Conservation Bonds (IRS)

These IRS 0% interest bonds are very similar to CREBs except they are allocated based on state and county population. New Jersey was allocated $90 million as part of the ARRA stimulus fund. QECBs are typically distributed through municipal bond banks or state economic development agencies.

7.1.7 Global Climate Change Mitigation Incentive Fund (US EDA)

The Economic Development Agency (part of the U.S. Department of Commerce) administers the GCCMIF to public works projects that reduce greenhouse gas emissions and creates new jobs. In FY 2012, $16.5 million was allocated to the fund, and additional funding is expected to be allocated in FY 2013. Applications are due on a rolling basis. Private sector and or for-profit companies are not eligible for this fund.

7.1.8 Private Tax-Exempt Financing

Similar to traditional municipal bond financing, there are many private financial service companies that offer a myriad of options for tax-exempt financing of municipal projects. The providers of these services suggest that this capital can be offered at competitive rates in an expedited timeframe and with fewer complications when compared to traditional municipal financing methods. Though these factors would need to be compared on a case-by-case basis, the one distinct advantage to private financing on the current project would likely be the flexibility to structure payments to meet budget needs with consideration given to the terms and conditions of existing loan and/or bond agreements.

For example, this mechanism could be used to limit the initial debt payments when the current bond debt is the greatest and the operations savings of the project has yet to be fully realized. It should also be noted that, in many cases, the construction and long term financing can be rolled into a single private financing agreement. Also, in some instances, equipment manufacturers have the ability to offer competitive financing terms (e.g. Siemens Financial Services Corporation), though financing from these sources is generally contingent upon a substantial portion of the project cost (~20% to 30%) being for their respective equipment.

7.1.9 Performance Based Contracts (ESCOs)

A second financing alternative for a project of this nature would be to enter into a Performance Based Contract with an Energy Services Company (ESCO). The premise of this type of contract is that it requires no initial municipal capital contributions in order to implement the project - instead relying on future operations cost savings and/or energy production, to fund the annual payments. Prior to entering into an agreement for the funding of the project, an ESCO would perform an energy audit and/or conceptual studies to confirm future energy cost savings or energy production inherent with the projects implementation and operation. The contract would then be formulated based on some measurable parameter(s) (energy production, etc) which would be verified by measurement throughout the contract duration. The savings in energy costs or energy production would then be used to pay back the capital investment of the project over the contract time period (typically on the order of 10-years or less).

The ESCO would guarantee the agreed upon energy savings or energy production. If the project does not meet energy savings or production commitments, the ESCO pays the owner the equivalent difference.

With this funding alternative, the ownership and operation of the facility would be maintained by the original owner. A performance contract may also include ESCO operation and maintenance of the energy-related facilities if that were deemed appropriate. Significant ESCO's with experience in this area include Siemens Building Technologies, Chevron and Johnson Controls. CDM Smith has functioned in several roles on performance based contracts including being the owner's representative and, on different contracts, providing design-build services (as a subcontractor to the ESCO). CDM Smith can provide additional experience-based information upon request.

7.1.10 Power Purchase Agreements (SPCs)

A Power Purchase Agreement (PPA) also delivers a project with no initial capital contribution by the original owner. In this model, a Special Purpose Company (SPC) created by a developer, would own the energy production facilities. Within the framework of a PPA, a SPC will typically lease property from the owners for construction and operation of the new facilities. The funding and construction of the new facilities would be performed by the SPC who would then own and operate the facilities for the duration of the contract (typically 20 to 30 years). Throughout that period of time, the original owner would purchase power from the SPC at a pre-negotiated rate which would take into account the initial capital cost, operation and maintenance of the constructed facility, ancillary benefits of the project and investor returns on investment. For renewable energy, financial incentives may enable this financing approach to compete favorably with utility power tariffs. Incentives include state and local tax credits, renewable energy credits, and Federal energy production tax credits or energy investment tax credits. It is expected that a number of experienced companies and developers may be interested in a PPA for New Jersey municipal renewable energy projects.

Photovoltaic array installations evaluated within this report would benefit from this program.

7.2 Energy Efficiency

7.2.1 Introduction

New Jersey's Clean Energy Program (NJ CEP) promotes increased energy efficiency and the use of clean, renewable sources of energy including solar, wind, geothermal, and sustainable biomass. The results for New Jersey are a stronger economy, less pollution, lower costs, and reduced demand for electricity. NJCEP offers financial incentives, programs, and services for residential, commercial, and municipal customers.

NJCEP reduces the need to generate electricity and burn natural gas which eliminates the pollution that would have been caused by such electric generation or natural gas usage. The benefits of these programs continue for the life of the measures installed, which on average is about 15 years. Thus, the public receives substantial environmental and public health benefits from programs that also lower energy bills and benefit the economy.

7.2.2 New Jersey Smart Start Buildings Program (NJ BPU)

The New Jersey Smart Start Buildings Program offers rebate incentives for several qualifying equipment such as high efficient premium motors and lighting, and lighting controls.

Incentive information and incentive calculation worksheets are provided for the various new equipment installation identified in this report and are included in Appendix F.

7.2.3 Pay for Performance Program (NJ BPU)

CDM Smith anticipates that the following buildings are possible candidates for the Pay for Performance Program. Westfield High School, Edison Intermediate School, Roosevelt Intermediate School, Franklin Elementary School, Jefferson Elementary School, Lincoln Elementary School, Tamaques Elementary School, and Wilson Elementary School. These potential candidates are based upon building models and energy savings calculations, and require further analysis to confirm they will qualify for the Pay for Performance Program.

Based on these preliminary estimates, we believe that this project might qualify for incentives through the Pay for Performance (P4P) program. If the project meets P4P program requirements and an application to the program is accepted, we estimate that the total P4P incentives to be approximately $104,563, which is paid in three installments: (1) Approval of Energy Reduction Plan; (2) Installation of recommended measures; (3) Verification of savings twelve months after installation of recommended measures. The incentives were calculated at $.1/ft^2 with a minimum incentive of $5,000.

Please note: This is a preliminary estimate of P4P incentives based on the assumptions in this report and P4P program eligibility rules. P4P incentives are not guaranteed until an application has been submitted and approved by the P4P program and all other program eligibility requirements have been met. Please see below for an overview of the P4P program.

The Pay for Performance Program is offered through the New Jersey Smart Start Program. Commercial, industrial and institutional buildings are eligible for participation if not already receiving Energy Efficiency and Conservation Block Grants.

Incentives are available for buildings that are able to present an Energy Reduction Plans that reduce the building's current energy consumption by 15% or more, in addition to incentives for installing the recommended measures and incentives for presenting the energy savings in a post-construction benchmarking report. No more than 50% of the total energy savings may be derived from lighting retrofits. In addition, the total energy savings of 15% may not come from the implementation of one energy savings measure. The incentive structure is provided in Appendix F.

7.2.4 Direct Install (NJ BPU)

Owners of existing small to mid-size commercial and industrial facilities with a peak electric demand that did not exceed 200 kW in any of the preceding 12 months are eligible to participate in Direct Install. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility companies.

This program will cover up to 70% of the retro-fitting costs associated with the use of new energy efficient equipment. Lighting, HVAC, refrigeration, motors, natural gas systems, and variable frequency drives are covered under the Direct Install program.

The buildings covered under this audit that are potentially eligible for participation in the Direct Install Program, based on the requirement to have not exceeded a peak demand of 200 kW in the preceding 12 months, are: Edison Intermediate School, Franklin Elementary School, Jefferson Elementary School, Lincoln Elementary School, McKinley Elementary School, Tamaques Elementary School, Washington Elementary School, Wilson Elementary School, Administration Building and Kehler Stadium Field House.

The Direct Install Program is designed to fast-track project implementation so energy savings can be realized sooner rather than later.

The steps for participation are to contact the contractor assigned and trained to provide Direct Install services in your County and schedule an Energy Assessment with this contractor. The contractor will assist in completing the Program Application and Participation Agreement.

The Energy Assessment with the participating contractor will work to determine which conservation measures qualify and the resulting project cost. Following this assessment, a scope of work will be finalized and installation will be arranged. Following completion of the installation a 'project completion form' must be submitted to the program representative assigned to the project.

The contractor for Union County is:

Tri-State Light & Energy
Greg Sheilds or Alan Rhode
Phone: 610-789-1900
Email: NJDirectInstall@TSLE.com

Any additional information on the Direct Install Program can be obtained by calling 866-NJSMART or by e-mail to DirectInstall@trcsolutions.com

Appendix A

Energy Audit Building	**Westfield High School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

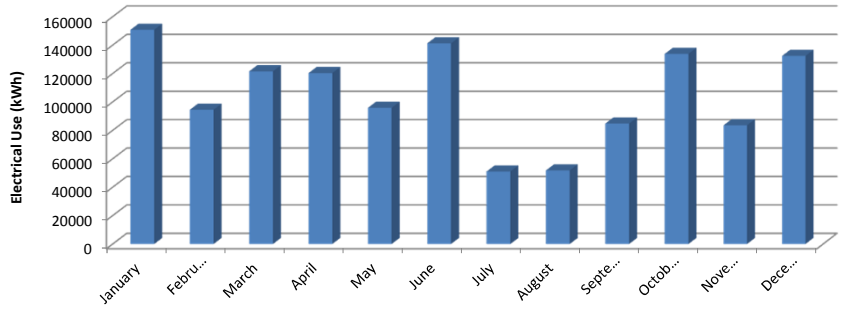
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

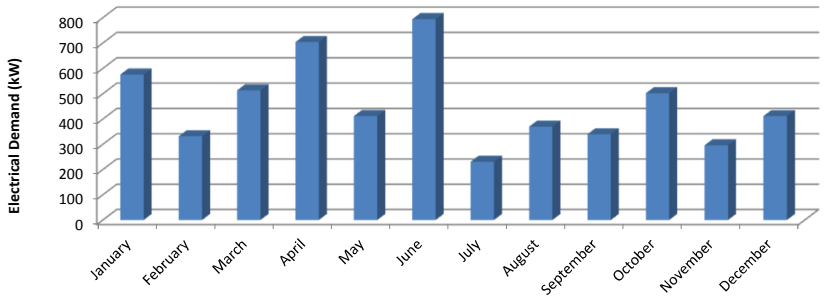
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 22,669.38				$ 22,669.38	148,800		148,800	466.00
Feb	1	Mar	1	$ 14,397.55				$ 14,397.55	95,600		95,600	332.00
Mar	1	Apr	1	$ 18,455.66				$ 18,455.66	119,600		119,600	404.00
Apr	1	May	1	$ 14,921.87				$ 14,921.87	94,401		94,401	374.00
May	1	June	1	$ 15,876.38				$ 15,876.38	100,402		100,402	412.10
June	1	July	1	$ 35,332.32				$ 35,332.32	159,206		159,206	794.10
July	1	Aug	1	$ 8,340.35				$ 8,340.35	45,600		45,600	152.00
Aug	1	Sept	1	$ 22,194.53				$ 22,194.53	51,820		51,820	370.00
Sept	1	Oct	1	$ 15,898.66				$ 15,898.66	84,800		84,800	340.00
Oct	1	Nov	1	$ 21,585.23				$ 21,585.23	133,800		133,800	502.00
Nov	1	Dec	1	$ 12,631.30				$ 12,631.30	83,600		83,600	296.00
Dec	1	Jan	1	$ 19,965.90				$ 19,965.90	132,400		132,400	412.00

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 23,513.37				$ 23,513.37	152,800		152,800	576.00
Feb	1	Mar	1	$ 14,082.32				$ 14,082.32	93,404		93404	293.80
Mar	1	Apr	1	$ 18,742.22				$ 18,742.22	123,524		123524	513.50
Apr	1	May	1	$ 24,241.38				$ 24,241.38	146,268		146268	704.00
May	1	June	1	$ 14,261.63				$ 14,261.63	91,315		91315	342.80
June	1	July	1	$ 26,001.45				$ 26,001.45	123,280		123280	641.8
July	1	Aug	1	$ 11,174.92				$ 11,174.92	56,516		56516	231.1
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Westfield High School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

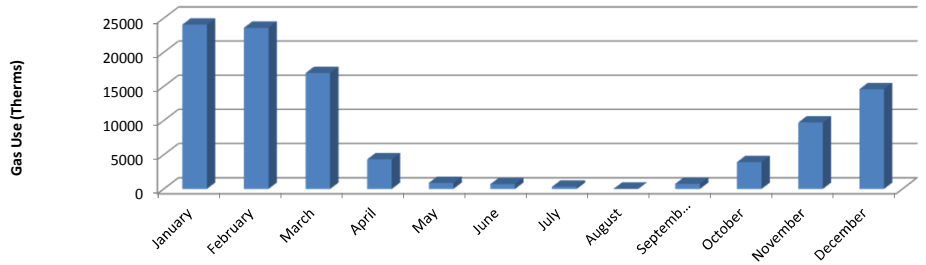
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 22,660.69				$ 22,660.69	25,205.8		25,206	
Feb	14	Mar	18	$ 20,140.51				$ 20,140.51	22,111.3		22,111	
Mar	18	Apr	15	$ 15,312.04				$ 15,312.04	17,096.8		17,097	
Apr	15	May	15	$ 3,588.33				$ 3,588.33	3,975.6		3,976	
May	15	June	16	$ 825.24				$ 825.24	880.3		880	
June	16	July	17	$ 602.06				$ 602.06	672.70		673	
July	17	Aug	15	$ 150.85				$ 150.85	130.60		131	
Aug	15	Sept	16	$ 66.74				$ 66.74	28.60		29	
Sept	16	Oct	16	$ 661.23				$ 661.23	759.10		759	
Oct	16	Nov	14	$ 3,083.80				$ 3,083.80	3,919.40		3,919	
Nov	1	Dec	1	$ 8,090.15				$ 8,090.15	9,711.40		9,711	
Dec	1	Jan	1	$ 12,226.93				$ 12,226.93	14,593.20		14,593	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 18,930.05				$ 18,930.05	22,898.8		22,899	
Feb	14	Mar	18	$ 20,505.27				$ 20,505.27	25,068.9		25,069	
Mar	18	Apr	15	$ 13,320.53				$ 13,320.53	16,809.8		16,810	
Apr	15	May	15	$ 3,728.53				$ 3,728.53	4,675.4		4,675	
May	15	June	16	$ 734.03				$ 734.03	880.3		880	
June	16	July	17	$ 638.81				$ 638.81	739.60		740	
July	17	Aug	15	$ 445.32				$ 445.32	517.00		517	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**Edison Intermediate School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

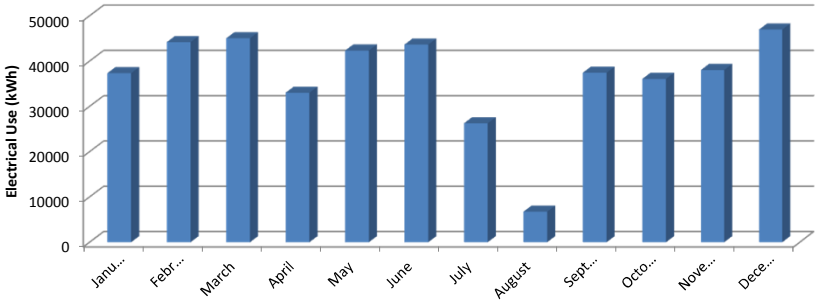
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

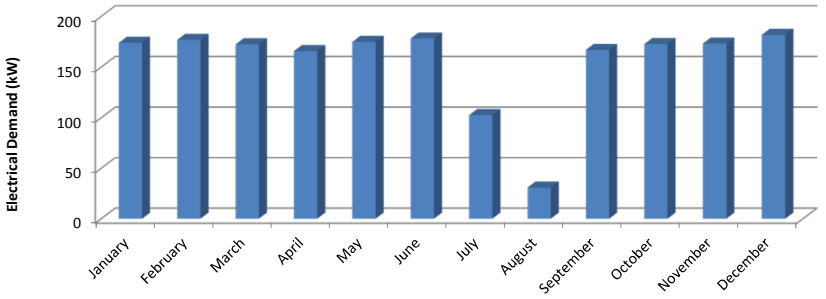
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 5,786.29				$ 5,786.29	37,240		37,240	174.40
Feb	1	Mar	1	$ 7,145.44				$ 7,145.44	46,248		46,248	175.70
Mar	1	Apr	1	$ 12,714.92				$ 12,714.92	79,980		79,980	180.50
Apr	1	May	1	$ 67.66				$ 67.66	184		184	0.00
May	1	June	1	$ 5,813.58				$ 5,813.58	36,199		36,199	162.70
June	1	July	1	$ 7,647.32				$ 7,647.32	39,645		39,645	168.10
July	1	Aug	1	$ 3,047.86				$ 3,047.86	14,209		14,209	63.00
Aug	1	Sept	1	$ 2,938.09				$ 2,938.09	13,478		13,478	61.70
Sept	1	Oct	1	$ 7,357.58				$ 7,357.58	37,438		37,438	166.90
Oct	1	Nov	1	$ 5,774.68				$ 5,774.68	36,064		36,064	172.60
Nov	1	Dec	1	$ 6,020.53				$ 6,020.53	38,040		38,040	173.20
Dec	1	Jan	1	$ 7,221.71				$ 7,221.71	46,968		46,968	181.80

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 5,933.86				$ 5,933.86	37,339		37,339	173.90
Feb	1	Mar	1	$ 7,011.55				$ 7,011.55	44,186		44186	176.80
Mar	1	Apr	1	$ 6,940.70				$ 6,940.70	45,036		45036	172.40
Apr	1	May	1	$ 5,493.14				$ 5,493.14	33,024		33024	165.80
May	1	June	1	$ 6,791.64				$ 6,791.64	42,329		42329	174.80
June	1	July	1	$ 8,759.94				$ 8,759.94	43,651		43651	178.2
July	1	Aug	1	$ 5,374.34				$ 5,374.34	26,263		26263	102.6
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Edison Intermediate School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

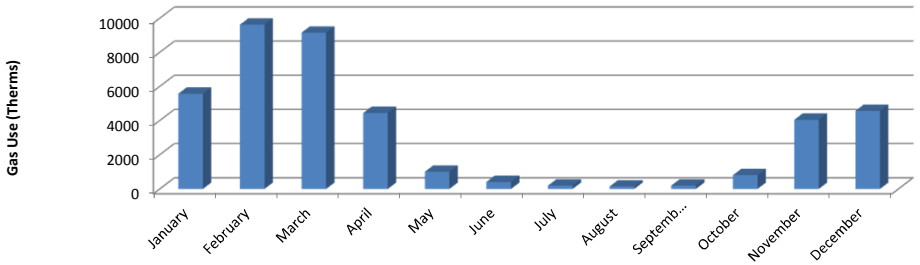
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 8,213.88				$ 8,213.88	10,440.0		10,440.00	
Feb	14	Mar	18	$ 7,237.67				$ 7,237.67	10,440.0		10,440.00	
Mar	18	Apr	15	$ 6,324.30				$ 6,324.30	7,159.0		7,159.00	
Apr	15	May	15	$ 1,276.02				$ 1,276.02	1,426.0		1,426.00	
May	15	June	16	$ 552.30				$ 552.30	604.0		604.00	
June	16	July	17	$ 221.31				$ 221.31	248.00		248.00	
July	17	Aug	15	$ 128.81				$ 128.81	134.00		134.00	
Aug	15	Sept	16	$ 135.62				$ 135.62	155.00		155.00	
Sept	16	Oct	16	$ 229.92				$ -	259.00		259.00	
Oct	16	Nov	14	$ 1,050.83				$ 1,050.83	1,263.00		1,263.00	
Nov	1	Dec	1	$2,935.11				$ 2,935.11	3,571.00		3,571.00	
Dec	1	Jan	1	$3,792.70				$ 3,792.70	4,595.00		4,595.00	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 7,220.85				$ 7,220.85	8,771.0		8,771.00	
Feb	14	Mar	18	$ 7,499.56				$ 7,499.56	9,206.0		9,206.00	
Mar	18	Apr	15	$ 6,177.17				$ 6,177.17	7,791.0		7,791.00	
Apr	15	May	15	$ 1,124.49				$ 1,124.49	1,398.0		1,398.00	
May	15	June	16	$ 234.09				$ 234.09	271.0		271.00	
June	16	July	17	$ 162.71				$ 162.71	176.00		176.00	
July	17	Aug	15	$ 109.14				$ 109.14	114.00		114.00	
Aug	15	Sept	16					$ -				
Sept	16	Oct	16					$ -				
Oct	16	Nov	14					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				



Energy Audit Building	**Roosevelt Intermediate School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

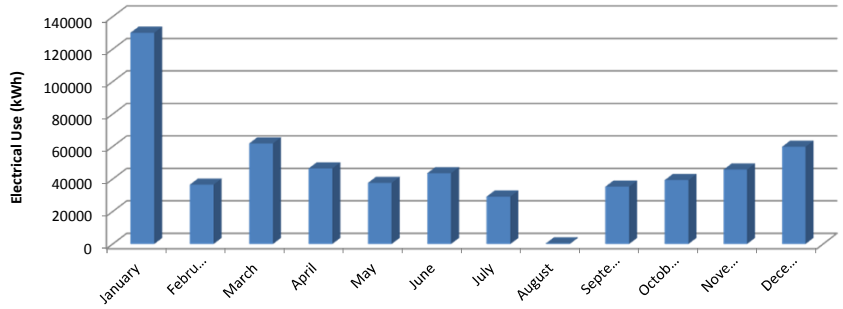
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

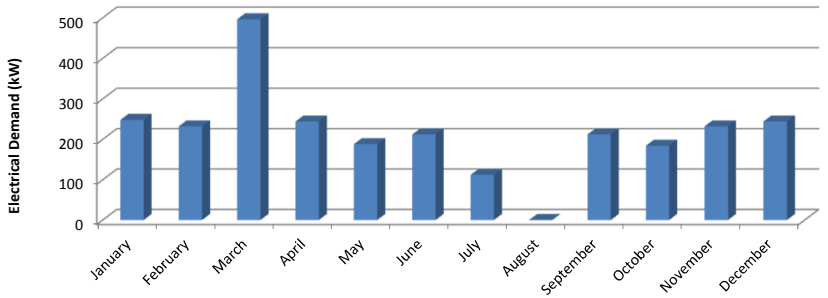
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 18,398.01				$ 18,398.01	122,664		122,664	236.00
Feb	1	Mar	1	$ 10,336.41				$ 10,336.41	72,548		72,548	232.00
Mar	1	Apr	1	$ 10,053.50				$ 10,053.50	65,348		65,348	240.00
Apr	1	May	1	$ 8,083.94				$ 8,083.94	47,338		47,338	244.00
May	1	June	1	$ 6,865.73				$ 6,865.73	37,631		37,631	180.00
June	1	July	1	$ 8,931.28				$ 8,931.28	43,211		43,211	204.00
July	1	Aug	1	$ 10,792.07				$ 10,792.07	38,036		38,036	112.00
Aug	1	Sept	1	$ 171.87				$ 171.87	429		429	0.00
Sept	1	Oct	1	$ 8,174.86				$ 8,174.86	35,297		35,297	212.00
Oct	1	Nov	1	$ 6,476.23				$ 6,476.23	39,340		39,340	184.00
Nov	1	Dec	1	$ 7,185.79				$ 7,185.79	45,836		45,836	232.00
Dec	1	Jan	1	$ 8,523.99				$ 8,523.99	59,880		59,880	244.00

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 18,310.49				$ 18,310.49	137,551		137,551	248.00
Feb	1	Mar	1	$ 187.82				$ 187.82	605		605	0.00
Mar	1	Apr	1	$ 8,630.92				$ 8,630.92	58,548		58548	496.00
Apr	1	May	1	$ 6,922.81				$ 6,922.81	45,738		45738	0.00
May	1	June	1	$ 6,653.40				$ 6,653.40	37,631		37631	188.00
June	1	July	1	$ 9,790.51				$ 9,790.51	44,011		44011	212.0
July	1	Aug	1	$ 5,734.57				$ 5,734.57	20,400		20400	96.0
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Roosevelt Intermediate School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

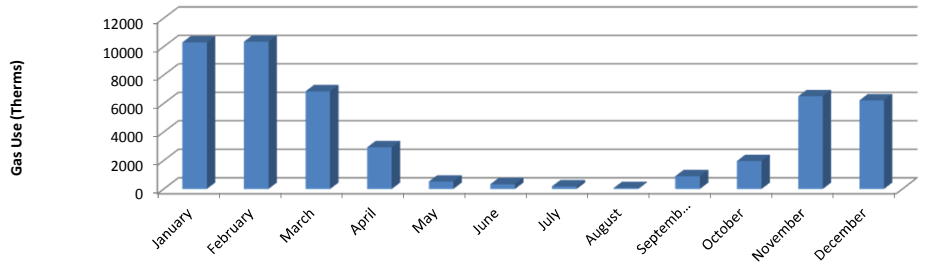
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 9,967.26				$ 9,967.26	11,058.0		11,058	
Feb	14	Mar	18	$ 10,185.65				$ 10,185.65	11,300.9		11,301	
Mar	18	Apr	15	$ 6,239.15				$ 6,239.15	6,923.1		6,923	
Apr	15	May	15	$ 3,172.52				$ 3,172.52	3,533.3		3,533	
May	15	June	16	$ 458.98				$ 458.98	482.2		482	
June	16	July	17	$ 219.06				$ 219.06	220.50		221	
July	17	Aug	15	$ 40.99				$ 40.99	1.20		1	
Aug	15	Sept	16	$ 87.45				$ 87.45	66.30		66	
Sept	16	Oct	16	$ 428.84				$ 428.84	898.90		899	
Oct	16	Nov	14	$ 1,644.04				$ 1,644.04	1,960.60		1,961	
Nov	1	Dec	1	$ 5,469.63				$ 5,469.63	6,509.90		6,510	
Dec	1	Jan	1	$ 5,251.31				$ 5,251.31	6,218.20		6,218	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 8,026.15				$ 8,026.15	9,529.2		9,529	
Feb	14	Mar	18	$ 7,775.35				$ 7,775.35	9,380.7		9,381	
Mar	18	Apr	15	$ 5,497.70				$ 5,497.70	6,783.0		6,783	
Apr	15	May	15	$ 1,866.80				$ 1,866.80	2,311.6		2,312	
May	15	June	16	$ 479.83				$ 479.83	554.1		554	
June	16	July	17	$ 407.70				$ 407.70	456.90		457	
July	17	Aug	15	$ 328.17				$ 328.17	367.60		368	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**Franklin Elementary School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

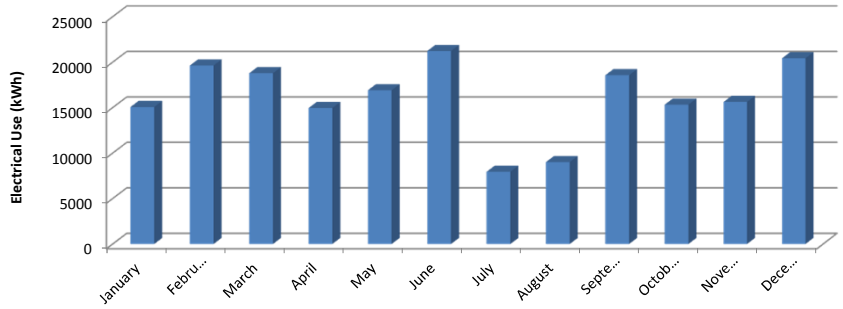
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1			$ -		$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

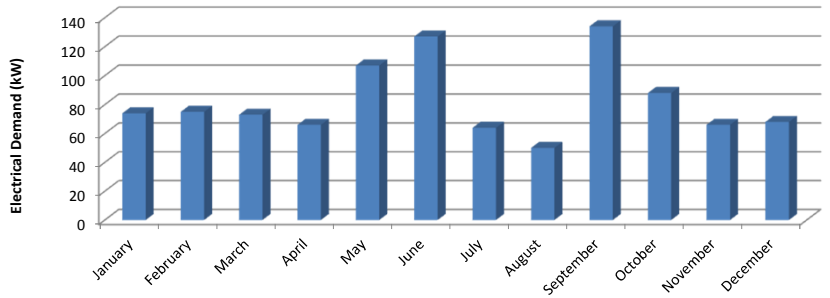
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,591.48				$ 2,591.48	16,603		16,603	74.00
Feb	1	Mar	1	$ 3,269.13				$ 3,269.13	20,433		20,433	75.00
Mar	1	Apr	1	$ 3,134.62				$ 3,134.62	19,479		19,479	73.00
Apr	1	May	1	$ 2,491.85				$ 2,491.85	15,120		15,120	65.00
May	1	June	1	$ 2,702.39				$ 2,702.39	16,000		16,000	86.00
June	1	July	1	$ 4,895.28				$ 4,895.28	21,748		21,748	127.00
July	1	Aug	1	$ 2,279.30				$ 2,279.30	7,416		7,416	64.00
Aug	1	Sept	1	$ 2,024.58				$ 2,024.58	9,013		9,013	50.00
Sept	1	Oct	1	$ 4,763.11				$ 4,763.11	18,563		18,563	134.00
Oct	1	Nov	1	$ 2,266.65				$ 2,266.65	15,328		15,328	88.00
Nov	1	Dec	1	$ 2,497.91				$ 2,497.91	15,626		15,626	66.00
Dec	1	Jan	1	$ 3,199.18				$ 3,199.18	20,431		20,431	68.00

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,249.20				$ 2,249.20	13,533		13,533	68.00
Feb	1	Mar	1	$ 3,016.62				$ 3,016.62	18,824		18824	68.00
Mar	1	Apr	1	$ 2,885.82				$ 2,885.82	18,084		18084	68.00
Apr	1	May	1	$ 2,507.72				$ 2,507.72	14,784		14784	66.00
May	1	June	1	$ 3,127.76				$ 3,127.76	17,821		17821	107.00
June	1	July	1	$ 4,811.31				$ 4,811.31	20,713		20713	127.0
July	1	Aug	1	$ 2,165.01				$ 2,165.01	8,477		8477	64.0
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Franklin Elementary School
Service Provider	PSE&G
Account Number	
Meter Number	

Legend
(Incomplete Data)

2012

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

2013

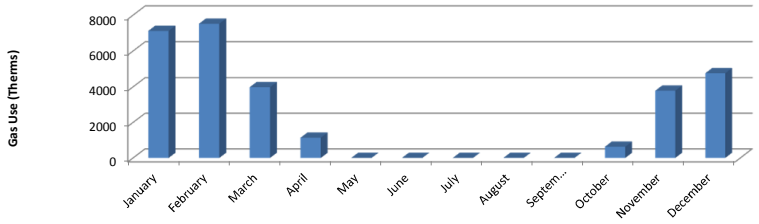
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18			$ -		$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 5,937.58				$ 5,937.58	6,591.0		6,591	
Feb	14	Mar	18	$ 6,696.67				$ 6,696.67	7,437.0		7,437	
Mar	18	Apr	15	$ 3,323.26				$ 3,323.26	3,689.0		3,689	
Apr	15	May	15	$ 1,117.93				$ 1,117.93	1,247.0		1,247	
May	15	June	16	$ 23.03				$ 23.03	4.0		4	
June	16	July	17	$ 26.66				$ 26.66	8.00		8	
July	17	Aug	15	$ 21.86				$ 21.86	2.00		2	
Aug	15	Sept	16	$ 26.66				$ 26.66	8.00		8	
Sept	16	Oct	16	$ 27.65				$ 27.65	9.00		9	
Oct	16	Nov	14	$ 537.57				$ 537.57	633.00		633	
Nov	1	Dec	1	$ 3,176.78				$ 3,176.78	3,785.00		3,785	
Dec	1	Jan	1	$ 4,008.98				$ 4,008.98	4,760.00		4,760	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 6,432.51				$ 6,432.51	7,652.0		7,652	
Feb	14	Mar	18	$ 6,296.02				$ 6,296.02	7,611.0		7,611	
Mar	18	Apr	15	$ 3,464.49				$ 3,464.49	4,281.0		4,281	
Apr	15	May	15	$ 836.35				$ 836.35	1,033.0		1,033	
May	15	June	16	$ 26.58				$ 26.58	8.0		8	
June	16	July	17	$ 24.74				$ 24.74	6.00		6	
July	17	Aug	15	$ 20.94				$ 20.94	1.00		1	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**Jefferson Elementary School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

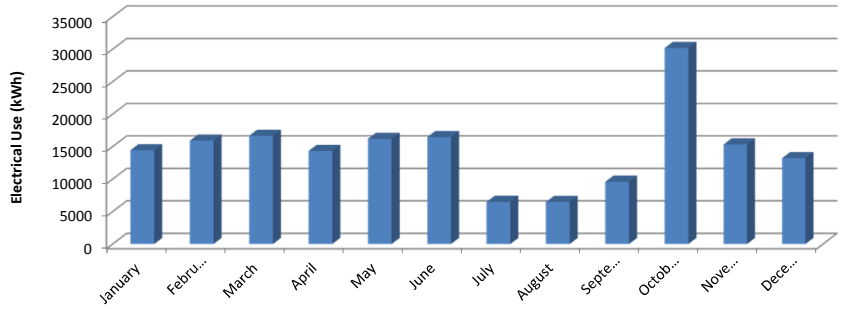
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

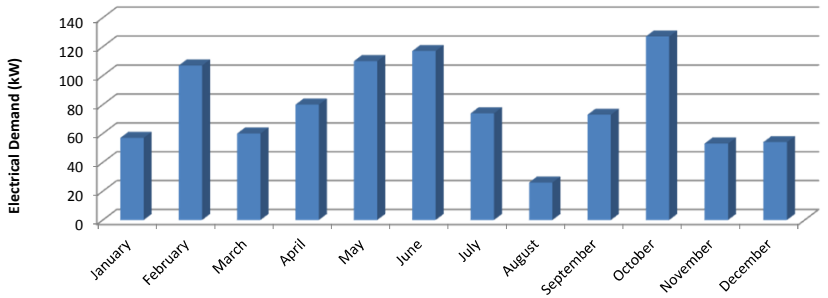
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,199.26				$ 2,199.26	13,885		13,885	57.00
Feb	1	Mar	1	$ 2,604.06				$ 2,604.06	16,171		16,171	58.00
Mar	1	Apr	1	$ 2,873.41				$ 2,873.41	17,845		17,845	60.00
Apr	1	May	1	$ 2,620.73				$ 2,620.73	16,115		16,115	57.00
May	1	June	1	$ 2,272.35				$ 2,272.35	13,691		13,691	55.00
June	1	July	1	$ 3,389.60				$ 3,389.60	16,257		16,257	73.00
July	1	Aug	1	$ 2,843.30				$ 2,843.30	12,507		12,507	74.00
Aug	1	Sept	1	$ 1,376.19				$ 1,376.19	6,472		6,472	26.00
Sept	1	Oct	1	$ 2,486.07				$ 2,486.07	9,594		9,594	73.00
Oct	1	Nov	1	$ 4,842.32				$ 4,842.32	30,188		30,188	127.00
Nov	1	Dec	1	$ 2,417.06				$ 2,417.06	15,339		15,339	53.00
Dec	1	Jan	1	$ 2,170.41				$ 2,170.41	13,226		13,226	54.00

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,415.19				$ 2,415.19	15,009		15,009	53.00
Feb	1	Mar	1	$ 2,545.86				$ 2,545.86	15,647		15647	107.00
Mar	1	Apr	1	$ 2,507.26				$ 2,507.26	15,505		15505	57.00
Apr	1	May	1	$ 2,261.56				$ 2,261.56	12,546		12546	80.00
May	1	June	1	$ 4,333.65				$ 4,333.65	18,700		18700	110.00
June	1	July	1	$ 4,099.27				$ 4,099.27	16,677		16677	117.0
July	1	Aug	1	$ 186.74				$ 186.74	480		480	0.0
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Jefferson Elementary School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

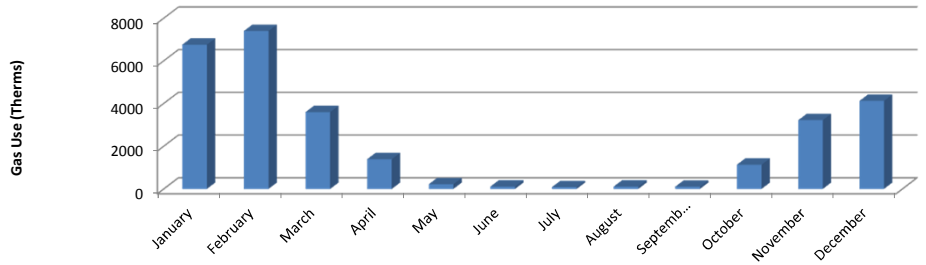
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 6,703.21				$ 6,703.21	7,444.0		7,444	
Feb	14	Mar	18	$ 7,329.50				$ 7,329.50	8,142.0		8,142	
Mar	18	Apr	15	$ 3,344.65				$ 3,344.65	3,714.0		3,714	
Apr	15	May	15	$ 1,472.31				$ 1,472.31	1,649.0		1,649	
May	15	June	16	$ 310.55				$ 310.55	334.0		334	
June	16	July	17	$ 117.50				$ 117.50	121.00		121	
July	17	Aug	15	$ 98.69				$ 98.69	97.00		97	
Aug	15	Sept	16	$ 110.39				$ 110.39	111.00		111	
Sept	16	Oct	16	$ 108.06				$ 108.06	107.00		107	
Oct	16	Nov	14	$ 949.35				$ 949.35	1,135.00		1,135	
Nov	1	Dec	1	$ 2,703.93				$ 2,703.93	3,218.00		3,218	
Dec	1	Jan	1	$ 3,471.44				$ 3,471.44	4,118.00		4,118	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 5,106.28				$ 5,106.28	6,069.0		6,069	
Feb	14	Mar	18	$ 5,510.27				$ 5,510.27	6,654.0		6,654	
Mar	18	Apr	15	$ 2,814.60				$ 2,814.60	3,473.0		3,473	
Apr	15	May	15	$ 916.00				$ 916.00	1,134.0		1,134	
May	15	June	16	$ 106.51				$ 106.51	109.0		109	
June	16	July	17	$ 101.88				$ 101.88	102.00		102	
July	17	Aug	15	$ 82.32				$ 82.32	80.00		80	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**Lincoln Elementary School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

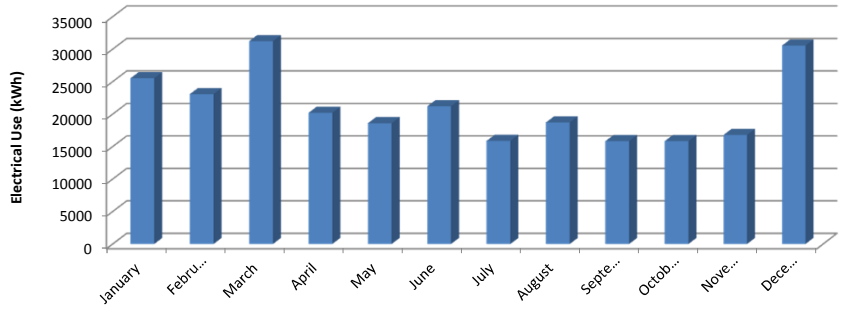
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

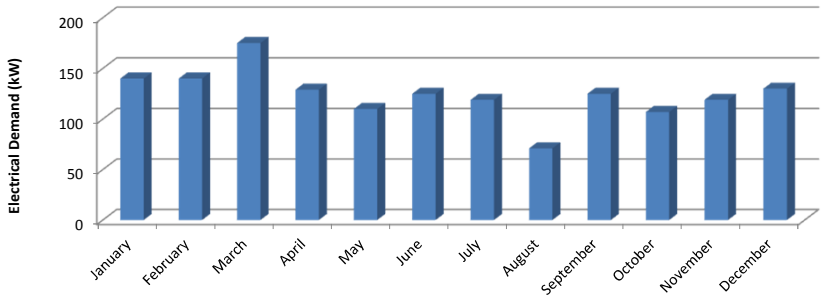
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 14,816.12				$ 14,816.12	96,880		96,880	140.00
Feb	1	Mar	1	$ -				$ -	0		0	0.00
Mar	1	Apr	1	$ 5,020.63				$ 5,020.63	31,760		31,760	134.00
Apr	1	May	1	$ 3,509.49				$ 3,509.49	21,280		21,280	123.00
May	1	June	1	$ 3,231.72				$ 3,231.72	19,760		19,760	108.00
June	1	July	1	$ 4,425.99				$ 4,425.99	20,000		20,000	125.00
July	1	Aug	1	$ 3,932.12				$ 3,932.12	16,960		16,960	119.00
Aug	1	Sept	1	$ 3,599.13				$ 3,599.13	18,720		18,720	71.00
Sept	1	Oct	1	$ 3,845.40				$ 3,845.40	15,840		15,840	125.00
Oct	1	Nov	1	$ 2,655.01				$ 2,655.01	15,840		15,840	107.00
Nov	1	Dec	1	$ 2,837.78				$ 2,837.78	16,800		16,800	119.00
Dec	1	Jan	1	$ 4,783.83				$ 4,783.83	30,560		30,560	130.00

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 4,131.64				$ 4,131.64	25,520		25,520	140.00
Feb	1	Mar	1	$ 6,979.56				$ 6,979.56	46,160		46160	140.00
Mar	1	Apr	1	$ 4,839.76				$ 4,839.76	30,720		30720	175.00
Apr	1	May	1	$ 3,307.12				$ 3,307.12	19,120		19120	129.00
May	1	June	1	$ 2,986.95				$ 2,986.95	17,440		17440	110.00
June	1	July	1	$ 2,888.46				$ 2,888.46	22,400		22400	120.0
July	1	Aug	1	$ 3,329.16				$ 3,329.16	14,800		14800	86.0
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Lincoln Elementary School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

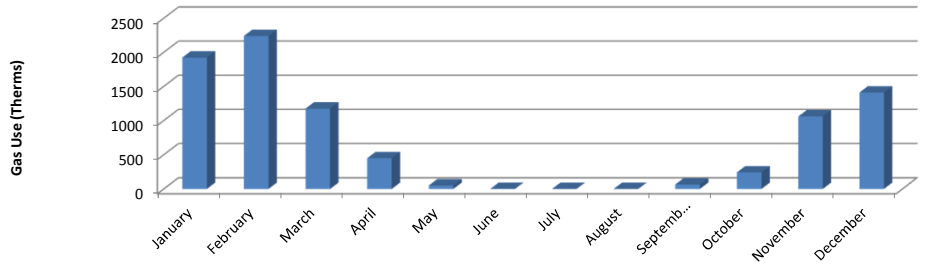
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 1,676.57				$ 1,676.57	1,845.0		1,845	
Feb	14	Mar	18	$ 2,036.85				$ 2,036.85	2,247.0		2,247	
Mar	18	Apr	15	$ 1,016.92				$ 1,016.92	1,114.0		1,114	
Apr	15	May	15	$ 604.08				$ 604.08	663.0		663	
May	15	June	16	$ 100.66				$ 100.66	93.0		93	
June	16	July	17	$ 22.51				$ 22.51	3.00		3	
July	17	Aug	15	$ 20.00				$ 20.00	0.00		0	
Aug	15	Sept	16	$ -				$ -	0.00		0	
Sept	16	Oct	16	$ 73.82				$ 73.82	66.00		66	
Oct	16	Nov	14	$ 218.27				$ 218.27	242.00		242	
Nov	1	Dec	1	$ 903.97				$ 903.97	1,060.00		1,060	
Dec	1	Jan	1	$ 1,201.95				$ 1,201.95	1,410.00		1,410	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 1,695.65				$ 1,695.65	1,999.0		1,999	
Feb	14	Mar	18	$ 1,861.68				$ 1,861.68	2,232.0		2,232	
Mar	18	Apr	15	$ 1,013.63				$ 1,013.63	1,235.0		1,235	
Apr	15	May	15	$ 205.39				$ 205.39	235.0		235	
May	15	June	16	$ 27.46				$ 27.46	9.0		9	
June	16	July	17	$ 20.00				$ 20.00	0.00		0	
July	17	Aug	15	$ 20.00				$ 20.00	0.00		0	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**McKinley School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

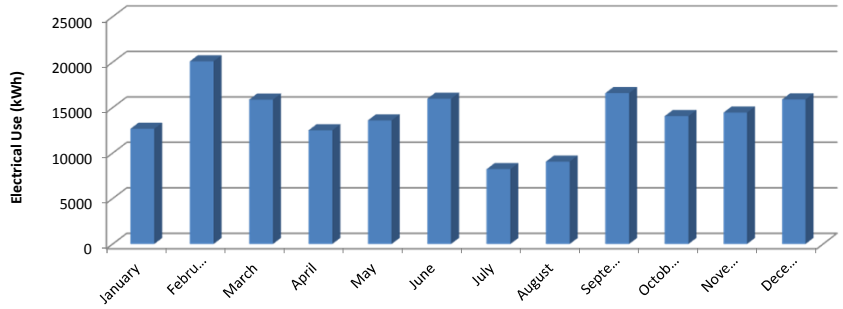
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

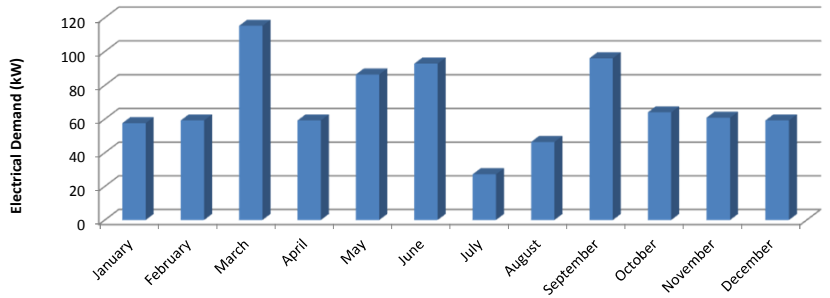
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 1,874.14				$ 1,874.14	12,022		12,022	54.40
Feb	1	Mar	1	$ 3,544.07				$ 3,544.07	23,546		23,546	5.20
Mar	1	Apr	1	$ 2,662.32				$ 2,662.32	16,923		16,923	59.20
Apr	1	May	1	$ 2,171.89				$ 2,171.89	13,378		13,378	59.20
May	1	June	1	$ 2,061.35				$ 2,061.35	12,725		12,725	54.40
June	1	July	1	$ 2,929.76				$ 2,929.76	14,769		14,769	60.80
July	1	Aug	1	$ 1,580.81				$ 1,580.81	8,224		8,224	27.20
Aug	1	Sept	1	$ 1,938.92				$ 1,938.92	9,066		9,066	46.40
Sept	1	Oct	1	$ 3,620.27				$ 3,620.27	16,593		16,593	96.00
Oct	1	Nov	1	$ 2,276.32				$ 2,276.32	14,064		14,064	64.00
Nov	1	Dec	1	$ 2,297.71				$ 2,297.71	14,459		14,459	60.80
Dec	1	Jan	1	$ 2,486.97				$ 2,486.97	15,893		15,893	59.20

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,130.04				$ 2,130.04	13,324		13,324	57.60
Feb	1	Mar	1	$ 2,592.84				$ 2,592.84	16,644		16644	59.20
Mar	1	Apr	1	$ 2,341.88				$ 2,341.88	14,843		14843	115.20
Apr	1	May	1	$ 1,931.99				$ 1,931.99	11,633		11633	54.40
May	1	June	1	$ 2,472.33				$ 2,472.33	14,470		14470	86.40
June	1	July	1	$ 3,817.27				$ 3,817.27	17,169		17169	92.8
July	1	Aug	1	$ 1,646.55				$ 1,646.55	8,240		8240	27.2
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	McKinley School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

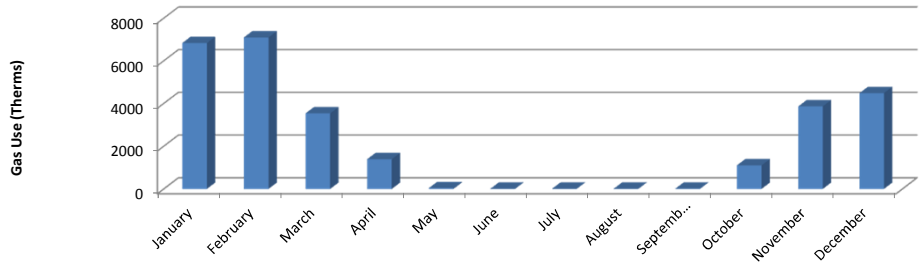
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 6,409.62				$ 6,409.62	7,117.2		7,117	
Feb	14	Mar	18	$ 6,343.72				$ 6,343.72	7,043.8		7,044	
Mar	18	Apr	15	$ 3,093.37				$ 3,093.37	3,433.4		3,433	
Apr	15	May	15	$ 1,469.92				$ 1,469.92	1,646.4		1,646	
May	15	June	16	$ 145.27				$ 145.27	31.4		31	
June	16	July	17	$ 26.55				$ 26.55	9.30		9	
July	17	Aug	15	$ 26.73				$ 26.73	8.30		8	
Aug	15	Sept	16	$ 26.73				$ 26.73	8.30		8	
Sept	16	Oct	16	$ 29.26				$ 29.26	11.40		11	
Oct	16	Nov	14	$ 923.36				$ 923.36	1,103.50		1,104	
Nov	1	Dec	1	$ 3,241.56				$ 3,241.56	3,862.40		3,862	
Dec	1	Jan	1	$ 3,778.41				$ 3,778.41	4,484.60		4,485	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 5,508.70				$ 5,508.70	6,549.2		6,549	
Feb	14	Mar	18	$ 6,145.91				$ 6,145.91	7,148.4		7,148	
Mar	18	Apr	15	$ 2,944.69				$ 2,944.69	3,634.9		3,635	
Apr	15	May	15	$ 917.89				$ 917.89	1,136.2		1,136	
May	15	June	16	$ 53.63				$ 53.63	42.4		42	
June	16	July	17	$ 26.66				$ 26.66	8.30		8	
July	17	Aug	15	$ 26.50				$ 26.50	8.30		8	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**Tamaques Elementary School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

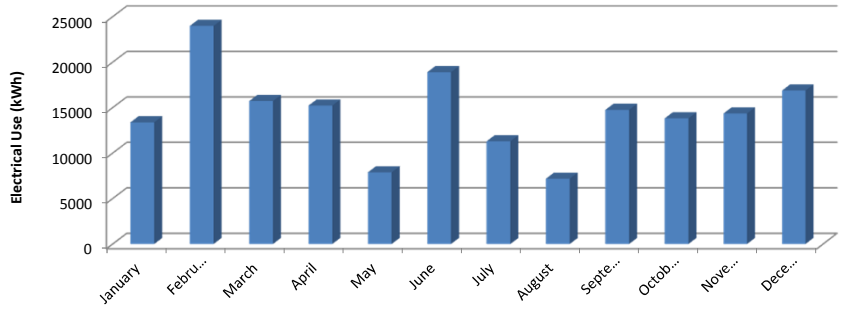
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

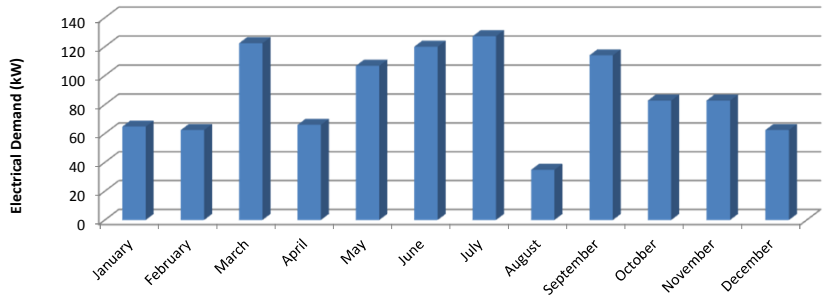
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 1,983.16				$ 1,983.16	12,534		12,534	64.80
Feb	1	Mar	1	$ 5,003.71				$ 5,003.71	31,616		31,616	61.20
Mar	1	Apr	1	$ 2,317.82				$ 2,317.82	14,162		14,162	66.00
Apr	1	May	1	$ 2,483.85				$ 2,483.85	15,341		15,341	66.00
May	1	June	1	$ 80.19				$ 80.19	210		210	0.00
June	1	July	1	$ 4,185.69				$ 4,185.69	18,539		18,539	117.60
July	1	Aug	1	$ 3,192.16				$ 3,192.16	10,872		10,872	127.20
Aug	1	Sept	1	$ 1,526.03				$ 1,526.03	7,188		7,188	34.80
Sept	1	Oct	1	$ 3,602.98				$ 3,602.98	14,754		14,754	114.00
Oct	1	Nov	1	$ 2,320.99				$ 2,320.99	13,821		13,821	82.80
Nov	1	Dec	1	$ 2,390.19				$ 2,390.19	14,365		14,365	82.80
Dec	1	Jan	1	$ 2,648.49				$ 2,648.49	16,880		16,880	62.40

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,284.49				$ 2,284.49	14,232		14,232	62.40
Feb	1	Mar	1	$ 2,579.70				$ 2,579.70	16,357		16357	62.40
Mar	1	Apr	1	$ 2,790.47				$ 2,790.47	17,282		17282	122.40
Apr	1	May	1	$ 2,499.49				$ 2,499.49	15,114		15114	66.00
May	1	June	1	$ 2,742.55				$ 2,742.55	15,557		15557	106.80
June	1	July	1	$ 4,467.71				$ 4,467.71	19,259		19259	120.0
July	1	Aug	1	$ 3,287.06				$ 3,287.06	11,726		11726	117.6
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Tamaques Elementary School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

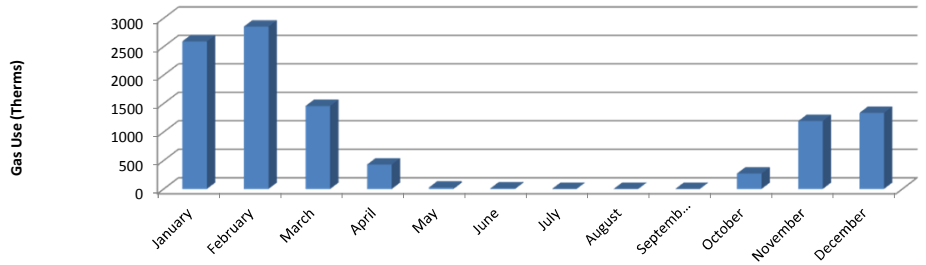
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 2,531.63				$ 2,531.63	2,797.6		2,798	
Feb	14	Mar	18	$ 2,470.22				$ 2,470.22	2,729.2		2,729	
Mar	18	Apr	15	$ 1,341.69				$ 1,341.69	1,476.5		1,477	
Apr	15	May	15	$ 436.44				$ 436.44	461.5		462	
May	15	June	16	$ 36.46				$ 36.46	18.9		19	
June	16	July	17	$ 20.00				$ 20.00	0.00		0	
July	17	Aug	15	$ 20.00				$ 20.00	0.00		0	
Aug	15	Sept	16	$ 20.00				$ 20.00	0.00		0	
Sept	16	Oct	16	$ 20.00				$ 20.00	0.00		0	
Oct	16	Nov	14	$ 240.78				$ 240.78	269.70		270	
Nov	1	Dec	1	$ 1,013.92				$ 1,013.92	1,191.60		1,192	
Dec	1	Jan	1	$ 1,138.68				$ 1,138.68	1,334.80		1,335	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 2,019.57				$ 2,019.57	2,385.9		2,386	
Feb	14	Mar	18	$ 2,375.20				$ 2,375.20	2,975.8		2,976	
Mar	18	Apr	15	$ 1,173.50				$ 1,173.50	1,433.6		1,434	
Apr	15	May	15	$ 333.34				$ 333.34	396.5		397	
May	15	June	16	$ 42.06				$ 42.06	27.8		28	
June	16	July	17	$ 36.02				$ 36.02	19.90		20	
July	17	Aug	15	$ 20.00				$ 20.00	0.00		0	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	Washington Elementary School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2012

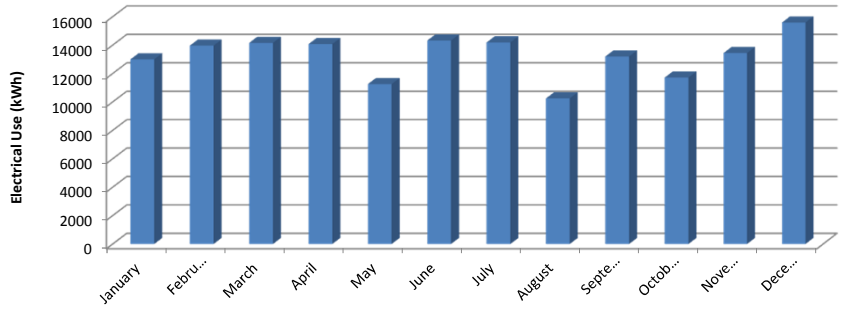
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

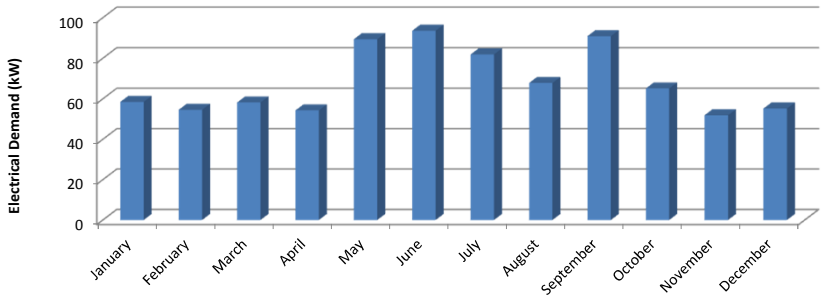
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,407.84				$ 2,407.84	15,759		15,759	58.50
Feb	1	Mar	1	$ 2,249.77				$ 2,249.77	14,144		14,144	54.30
Mar	1	Apr	1	$ 2,417.32				$ 2,417.32	15,074		15,074	58.20
Apr	1	May	1	$ 2,177.82				$ 2,177.82	13,448		13,448	54.30
May	1	June	1	$ 2,095.42				$ 2,095.42	12,920		12,920	51.90
June	1	July	1	$ 3,039.26				$ 3,039.26	13,378		13,378	85.20
July	1	Aug	1	$ 3,340.54				$ 3,340.54	15,649		15,649	81.90
Aug	1	Sept	1	$ 2,392.59				$ 2,392.59	10,250		10,250	67.80
Sept	1	Oct	1	$ 3,100.13				$ 3,100.13	13,200		13,200	90.90
Oct	1	Nov	1	$ 1,963.31				$ 1,963.31	11,715		11,715	65.10
Nov	1	Dec	1	$ 2,107.72				$ 2,107.72	13,442		13,442	51.90
Dec	1	Jan	1	$ 2,442.66				$ 2,442.66	15,593		15,593	55.20

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 1,743.45				$ 1,743.45	10,241		10,241	55.20
Feb	1	Mar	1	$ 2,197.77				$ 2,197.77	13,782		13782	54.60
Mar	1	Apr	1	$ 2,124.86				$ 2,124.86	13,244		13244	54.00
Apr	1	May	1	$ 2,376.14				$ 2,376.14	14,700		14700	54.30
May	1	June	1	$ 1,876.45				$ 1,876.45	9,598		9598	89.40
June	1	July	1	$ 3,563.37				$ 3,563.37	15,268		15268	93.6
July	1	Aug	1	$ 3,025.89				$ 3,025.89	12,733		12733	81.6
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Washington Elementary School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

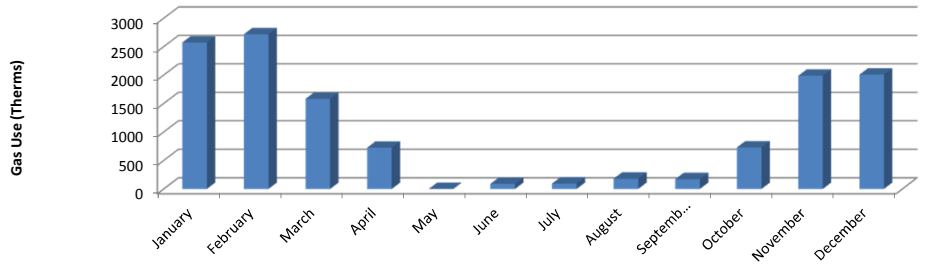
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 4,637.59				$ 4,637.59	5,143.4		5,143	
Feb	14	Mar	18	$ 4,899.12				$ 4,899.12	5,434.7		5,435	
Mar	18	Apr	15	$ 2,768.93				$ 2,768.93	3,070.0		3,070	
Apr	15	May	15	$ 1,296.10				$ 1,296.10	1,449.0		1,449	
May	15	June	16	$ 199.55				$ 199.55	0.8		1	
June	16	July	17	$ 166.03				$ 166.03	179.80		180	
July	17	Aug	15	$ 155.04				$ 155.04	166.30		166	
Aug	15	Sept	16	$ 166.74				$ 166.74	180.70		181	
Sept	16	Oct	16	$ 160.05				$ 160.05	172.30		172	
Oct	16	Nov	14	$ 615.93				$ 615.93	728.40		728	
Nov	1	Dec	1	$ 1,677.72				$ 1,677.72	1,987.50		1,988	
Dec	1	Jan	1	$ 1,702.25				$ 1,702.25	2,007.30		2,007	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 208.15				$ 208.15	0.0		0	
Feb	14	Mar	18	$ 20.00				$ 20.00	0.0		0	
Mar	18	Apr	15	$ 93.45				$ 93.45	91.3		91	
Apr	15	May	15	$ 20.00				$ 20.00	0.0		0	
May	15	June	16	$ 20.00				$ 20.00	0.0		0	
June	16	July	17	$ 20.00				$ 20.00	0.00		0	
July	17	Aug	15	$ 39.05				$ 39.05	24.30		24	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**Wilson Elementary School**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

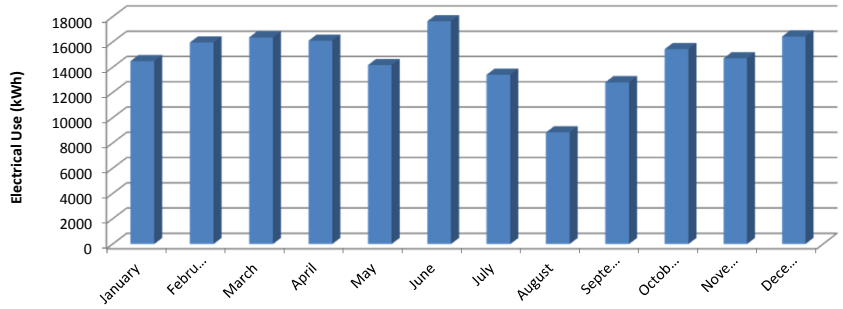
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

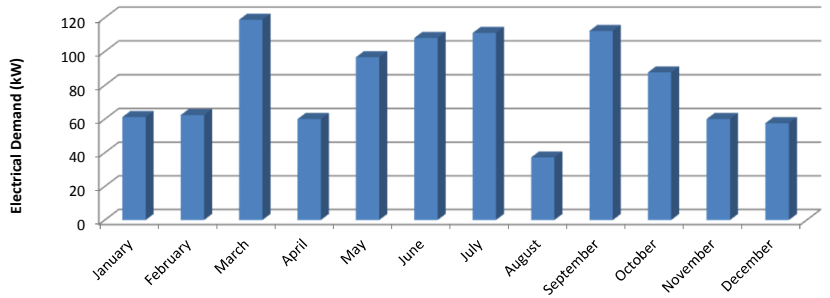
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,262.14				$ 2,262.14	14,469		14,469	61.20
Feb	1	Mar	1	$ 2,567.85				$ 2,567.85	15,854		15,854	62.40
Mar	1	Apr	1	$ 2,619.35				$ 2,619.35	16,244		16,244	60.60
Apr	1	May	1	$ 2,613.03				$ 2,613.03	16,208		16,208	60.00
May	1	June	1	$ 2,365.97				$ 2,365.97	14,510		14,510	57.60
June	1	July	1	$ 3,894.97				$ 3,894.97	18,538		18,538	90.60
July	1	Aug	1	$ 3,150.46				$ 3,150.46	12,199		12,199	105.60
Aug	1	Sept	1	$ 1,827.89				$ 1,827.89	8,840		8,840	37.20
Sept	1	Oct	1	$ 3,331.41				$ 3,331.41	12,810		12,810	112.20
Oct	1	Nov	1	$ 2,598.49				$ 2,598.49	15,435		15,435	87.60
Nov	1	Dec	1	$ 2,340.83				$ 2,340.83	14,702		14,702	60.00
Dec	1	Jan	1	$ 2,597.20				$ 2,597.20	16,433		16,433	57.60

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 2,336.92				$ 2,336.92	14,501		14,501	58.80
Feb	1	Mar	1	$ 2,591.00				$ 2,591.00	16,062		16062	60.60
Mar	1	Apr	1	$ 2,627.26				$ 2,627.26	16,484		16484	118.80
Apr	1	May	1	$ 2,636.14				$ 2,636.14	15,990		15990	58.20
May	1	June	1	$ 2,495.11				$ 2,495.11	13,828		13828	96.60
June	1	July	1	$ 3,972.63				$ 3,972.63	16,738		16738	108.0
July	1	Aug	1	$ 3,676.63				$ 3,676.63	14,623		14623	111.0
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Wilson Elementary School	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

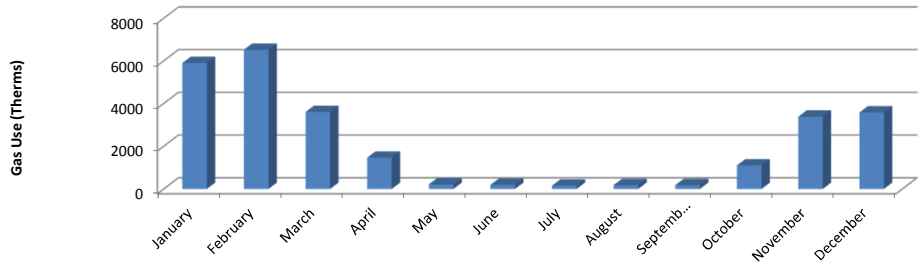
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 5,541.33				$ 5,541.33	6,150.0		6,150	
Feb	14	Mar	18	$ 5,171.25				$ 5,171.25	5,737.8		5,738	
Mar	18	Apr	15	$ 3,309.94				$ 3,309.94	3,674.2		3,674	
Apr	15	May	15	$ 1,536.00				$ 1,536.00	1,721.4		1,721	
May	15	June	16	$ 216.96				$ 216.96	226.7		227	
June	16	July	17	$ 170.47				$ 170.47	185.30		185	
July	17	Aug	15	$ 148.80				$ 148.80	158.60		159	
Aug	15	Sept	16	$ 166.74				$ 166.74	180.70		181	
Sept	16	Oct	16	$ 165.43				$ 165.43	178.90		179	
Oct	16	Nov	14	$ 920.78				$ 920.78	1,101.00		1,101	
Nov	1	Dec	1	$ 2,837.48				$ 2,837.48	3,378.00		3,378	
Dec	1	Jan	1	$ 3,018.47				$ 3,018.47	3,577.80		3,578	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 4,747.72				$ 4,747.72	5,641.2		5,641	
Feb	14	Mar	18	$ 6,049.40				$ 6,049.40	7,299.7		7,300	
Mar	18	Apr	15	$ 2,850.48				$ 2,850.48	3,517.8		3,518	
Apr	15	May	15	$ 1,068.80				$ 1,068.80	1,200.6		1,201	
May	15	June	16	$ 177.96				$ 177.96	199.0		199	
June	16	July	17	$ 177.57				$ 177.57	195.80		196	
July	17	Aug	15	$ 139.48				$ 139.48	152.40		152	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**Administration Building**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2013

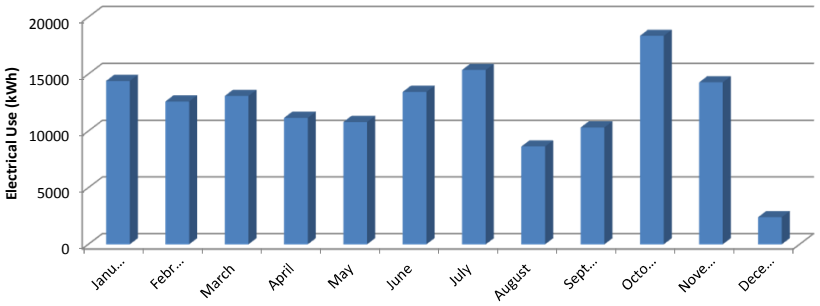
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1			$ -		$ 3,133.84			16800	65
Sept	1	Oct	1					$ 2,733.15			13920	65
Oct	1	Nov	1					$ 2,751.31			17760	91.00
Nov	1	Dec	1					$ 1,569.10			10320	46
Dec	1	Jan	1					$ 2,045.83			13680	53.00

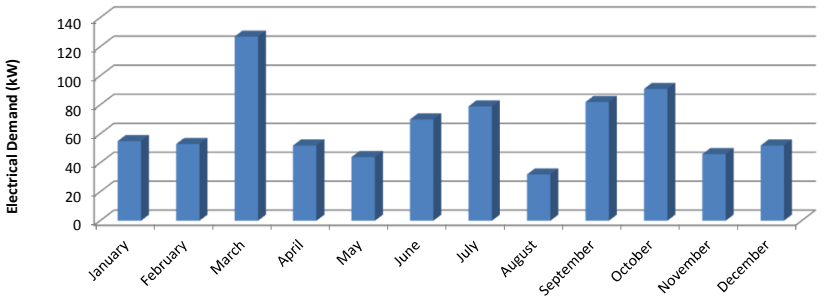
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1					$ 1,486.25			9,480	55.00
Feb	1	Mar	1					$ 2,090.44			13,320	53.00
Mar	1	Apr	1					$ 1,820.43			11,400	52.00
Apr	1	May	1					$ 2,055.52			13,080	52.00
May	1	June	1					$ 1,571.31			9,840	44.00
June	1	July	1					$ 3,090.23			15,120	73.00
July	1	Aug	1					$ 3,137.92			14,880	79.00
Aug	1	Sept	1					$ 3,311.16			17,280	64.00
Sept	1	Oct	1					$ 2,510.42			10,320	82.00
Oct	1	Nov	1					$ 2,933.58			18,360	91.00
Nov	1	Dec	1					$ 2,171.16			14,280	46.00
Dec	1	Jan	1					$ 558.92			2,400	52.00

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1					$ 2,230.01			14,400	55.00
Feb	1	Mar	1					$ 1,971.48			12600	53.00
Mar	1	Apr	1					$ 2,084.87			13080	127.00
Apr	1	May	1					$ 1,831.37			11160	52.00
May	1	June	1					$ 1,748.95			10800	44.00
June	1	July	1					$ 2,904.99			13440	70.0
July	1	Aug	1					$ 3,312.60			15360	79.0
Aug	1	Sept	1					$ -			0	0.0
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	**Administration Building**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

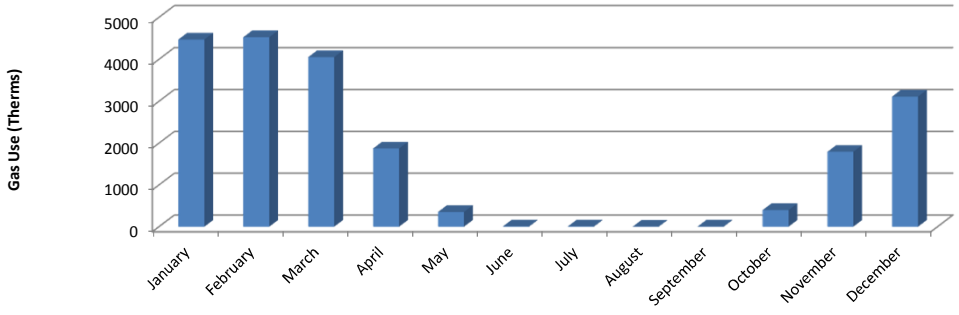
2013

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ 24.60			6	
Sept	1	Oct	1					$ 27.48			9	
Oct	1	Nov	1					$ 709.29			804	
Nov	1	Dec	1					$ 2,325.07			2583	
Dec	1	Jan	1					$ 3,955.75			4404	

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ 3,721.88			4123	
Feb	1	Mar	1					$ 3,910.50			4334	
Mar	1	Apr	1					$ 2,372.33			2,628.0	
Apr	1	May	1					$ 872.06			968.0	
May	1	June	1					$ 28.70			10.0	
June	1	July	1					$ 26.26			8.0	
July	1	Aug	1					$ 24.47			6.0	
Aug	1	Sept	1					$ 25.25			7.0	
Sept	18	Oct	18			$ -		$ 31.71			14.00	
Oct	18	Nov	14					$ 658.48			780.00	
Nov	14	Dec	17					$ 2,460.89			2,807.00	
Dec	17	Jan	16					$ 2,982.33			3,535.00	

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14					$ 4,181.88			4,966.00	
Feb	14	Mar	18					$ 3,728.66			4,861.00	
Mar	18	Apr	15					$ 2,354.83			2,902.00	
Apr	15	May	15					$ 589.47			721.00	
May	15	June	16					$ 27.07			9.00	
June	16	July	17					$ 16.98			8.00	
July	17	Aug	15					$ 24.31			6.00	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16	$ -				$ -				
Oct	16	Nov	14					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				



Energy Audit Building	**Keller Field House**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

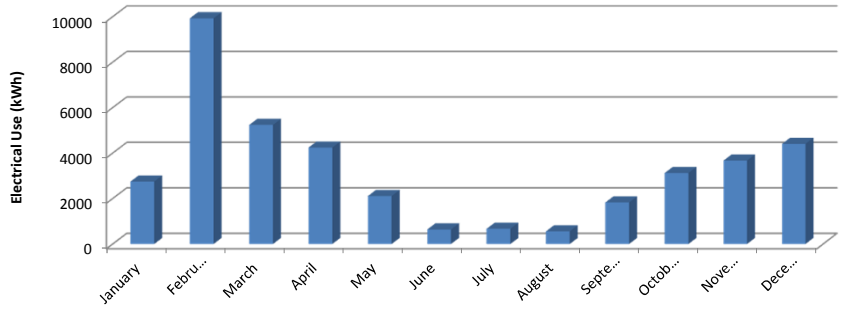
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

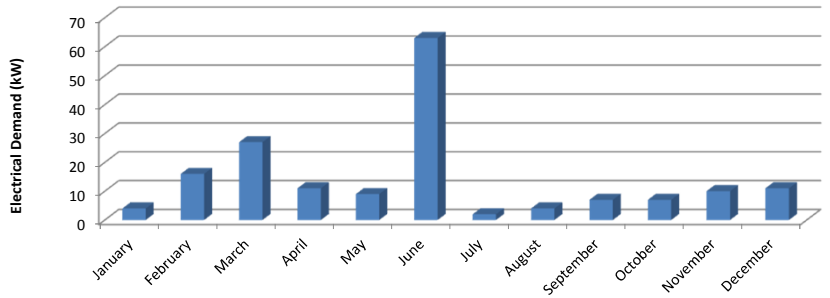
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 496.42				$ 496.42	2,478		2,478	4.00
Feb	1	Mar	1	$ 1,160.85				$ 1,160.85	9,180		9,180	4.00
Mar	1	Apr	1	$ 754.20				$ 754.20	4,730		4,730	10.00
Apr	1	May	1	$ 654.41				$ 654.41	3,935		3,935	11.00
May	1	June	1	$ 447.15				$ 447.15	2,273		2,273	9.00
June	1	July	1	$ 254.76				$ 254.76	894		894	63.00
July	1	Aug	1	$ 154.03				$ 154.03	779		779	2.00
Aug	1	Sept	1	$ 144.80				$ 144.80	558		558	4.00
Sept	1	Oct	1	$ 321.49				$ 321.49	1,828		1,828	7.00
Oct	1	Nov	1	$ 372.89				$ 372.89	3,125		3,125	7.00
Nov	1	Dec	1	$ 430.50				$ 430.50	3,673		3,673	10.00
Dec	1	Jan	1	$ 504.36				$ 504.36	4,407		4,407	11.00

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 334.52				$ 334.52	3,019		3,019	4.00
Feb	1	Mar	1	$ 1,118.87				$ 1,118.87	10,679		10679	16.00
Mar	1	Apr	1	$ 647.87				$ 647.87	5,746		5746	27.00
Apr	1	May	1	$ 549.12				$ 549.12	4,552		4552	10.00
May	1	June	1	$ 270.79				$ 270.79	1,951		1951	8.00
June	1	July	1	$ 118.97				$ 118.97	387		387	2.0
July	1	Aug	1	$ 139.02				$ 139.02	563		563	2.0
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	**Keller Field House**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2013

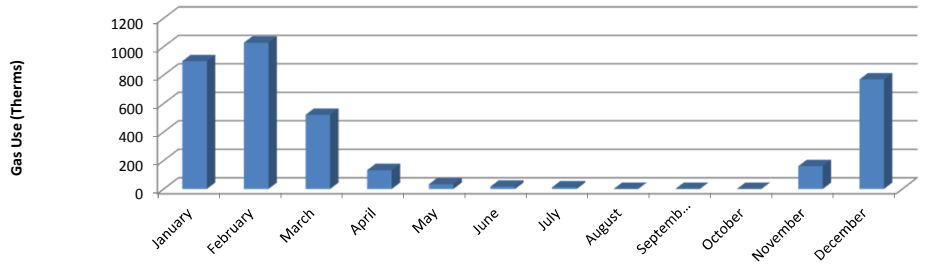
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18					$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 866.93				$ 866.93	784.0		784	
Feb	14	Mar	18	$ 984.28				$ 984.28	824.0		824	
Mar	18	Apr	15	$ 469.21				$ 469.21	405.0		405	
Apr	15	May	15	$ 64.15				$ 64.15	41.0		41	
May	15	June	16	$ 21.11				$ 21.11	1.0		1	
June	16	July	17	$ 20.00				$ 20.00	0.00		0	
July	17	Aug	15	$ 20.00				$ 20.00	0.00		0	
Aug	15	Sept	16	$ 20.00				$ 20.00	0.00		0	
Sept	16	Oct	16	$ 20.00				$ 20.00	0.00		0	
Oct	16	Nov	14	$ 20.00				$ 20.00	0.00		0	
Nov	1	Dec	1	$ 168.40				$ 168.40	160.00		160	
Dec	1	Jan	1	$ 761.22				$ 761.22	769.00		769	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 887.54				$ 887.54	1,011.0		1,011	
Feb	14	Mar	18	$ 1,018.63				$ 1,018.63	1,231.0		1,231	
Mar	18	Apr	15	$ 519.71				$ 519.71	635.0		635	
Apr	15	May	15	$ 189.01				$ 189.01	223.0		223	
May	15	June	16	$ 67.93				$ 67.93	64.0		64	
June	16	July	17	$ 45.55				$ 45.55	33.00		33	
July	17	Aug	15	$ 37.07				$ 37.07	23.00		23	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Energy Audit Building	**Fieldhouse Utility**	Legend
Service Provider	**PSE&G**	(Incomplete Data)
Account Number		
Meter Number		

2012

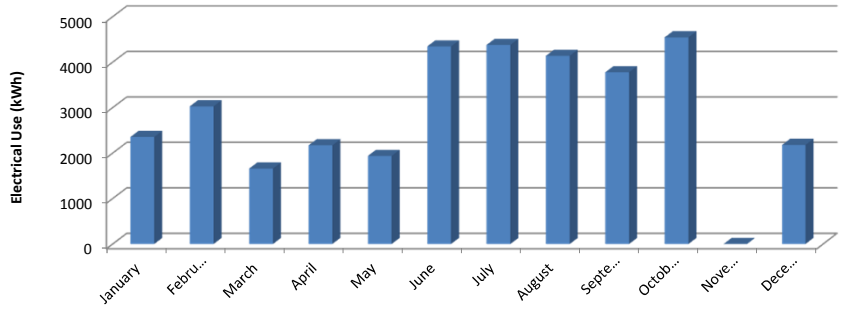
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1									
Feb	1	Mar	1									
Mar	1	Apr	1									
Apr	1	May	1									
May	1	June	1									
June	1	July	1									
July	1	Aug	1									
Aug	1	Sept	1					$ -				
Sept	1	Oct	1					$ -				
Oct	1	Nov	1					$ -				
Nov	1	Dec	1					$ -				
Dec	1	Jan	1					$ -				

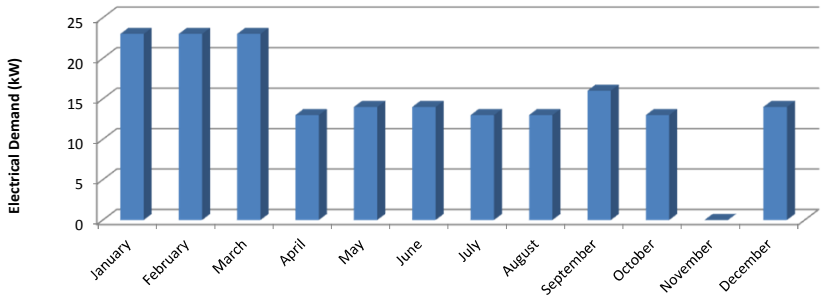
2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 377.68				$ 377.68	2,070		2,070	23.00
Feb	1	Mar	1	$ 438.24				$ 438.24	2,376		2,376	23.00
Mar	1	Apr	1	$ 399.88				$ 399.88	2,096		2,096	23.00
Apr	1	May	1	$ 399.54				$ 399.54	2,424		2,424	12.00
May	1	June	1	$ 285.49				$ 285.49	1,658		1,658	11.00
June	1	July	1	$ 839.26				$ 839.26	4,558		4,558	14.00
July	1	Aug	1	$ 805.95				$ 805.95	4,380		4,380	13.00
Aug	1	Sept	1	$ 771.97				$ 771.97	4,140		4,140	13.00
Sept	1	Oct	1	$ 750.19				$ 750.19	3,778		3,778	16.00
Oct	1	Nov	1	$ 749.41				$ 749.41	4,546		4,546	13.00
Nov	1	Dec	1	$ -				$ -	0		0	0.00
Dec	1	Jan	1	$ 368.92				$ 368.92	2,180		2,180	14.00

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Total kWh (1)	Total kWh (2)	Total kWh	Demand kW
Jan	1	Feb	1	$ 423.37				$ 423.37	2,640		2,640	12.00
Feb	1	Mar	1	$ 713.80				$ 713.80	3,680		3680	15.00
Mar	1	Apr	1	$ 74.74				$ 74.74	1,224		1224	8.00
Apr	1	May	1	$ 343.33				$ 343.33	1,918		1918	13.00
May	1	June	1	$ 390.18				$ 390.18	2,220		2220	14.00
June	1	July	1	$ 807.92				$ 807.92	4,136		4136	14.0
July	1	Aug	1	$ 835.56				$ 835.56	4,380		4380	13.0
Aug	1	Sept	1					$ -				
Sept	1	Oct	1									
Oct	1	Nov	1									
Nov	1	Dec	1									
Dec	1	Jan	1									





Energy Audit Building	Fieldhouse Utility	Legend
Service Provider	PSE&G	(Incomplete Data)
Account Number		
Meter Number		

2013

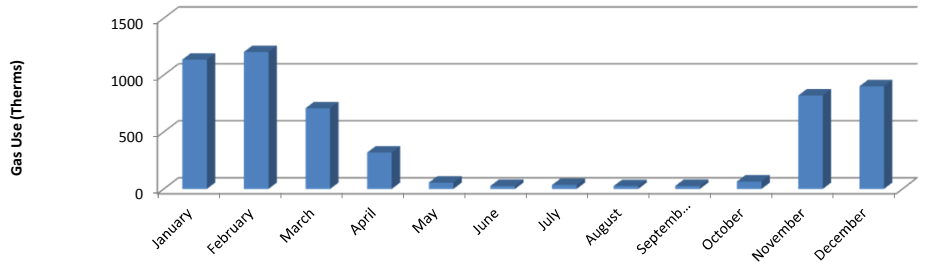
Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	1	Feb	1					$ -				
Feb	1	Mar	1					$ -				
Mar	1	Apr	1					$ -				
Apr	1	May	1					$ -				
May	1	June	1					$ -				
June	1	July	1					$ -				
July	1	Aug	1					$ -				
Aug	1	Sept	1					$ -				
Sept	18	Oct	18			$ -		$ -				
Oct	18	Nov	14					$ -				
Nov	14	Dec	17					$ -				
Dec	17	Jan	16					$ -				

2014

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 1,002.15				$ 1,002.15	1,094.0		1,094	
Feb	14	Mar	18	$ 1,041.13				$ 1,041.13	1,137.0		1,137	
Mar	18	Apr	15	$ 601.04				$ 601.04	649.0		649	
Apr	15	May	15	$ 264.83				$ 264.83	278.0		278	
May	15	June	16	$ 46.20				$ 46.20	30.0		30	
June	16	July	17	$ 40.14				$ 40.14	25.00		25	
July	17	Aug	15	$ 46.00				$ 46.00	32.00		32	
Aug	15	Sept	16	$ 40.95				$ 40.95	26.00		26	
Sept	16	Oct	16	$ 31.87				$ 31.87	27.00		27	
Oct	16	Nov	14	$ 73.36				$ 73.36	65.00		65	
Nov	1	Dec	1	$ 703.70				$ 703.70	820.00		820	
Dec	1	Jan	1	$ 775.03				$ 775.03	901.00		901	

2015

Month	Day	Month	Day	Delivery Charge (1)	Delivery Charge (2)	Supply Charge (1)	Supply Charge (2)	Total Charge	Therms (1)	Therms (2)	Total Therms	Supplier
Jan	16	Feb	14	$ 1,005.74				$ 1,005.74	1,176.0		1,176	
Feb	14	Mar	18	$ 1,128.98				$ 1,128.98	1,269.0		1,269	
Mar	18	Apr	15	$ 636.00				$ 636.00	766.0		766	
Apr	15	May	15	$ 305.35				$ 305.35	360.0		360	
May	15	June	16	$ 84.43				$ 84.43	81.0		81	
June	16	July	17	$ 42.54				$ 42.54	28.00		28	
July	17	Aug	15	$ 50.03				$ 50.03	38.00		38	
Aug	15	Sept	16					$ -			0.00	
Sept	16	Oct	16					$ -			0.0	
Oct	16	Nov	14					$ -			0	
Nov	1	Dec	1					$ -			0	
Dec	1	Jan	1					$ -			0	



Appendix B

ENERGY STAR® Statement of Energy Performance

85

ENERGY STAR® Score[1]

Westfield High School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 302,300
Built: 1925

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Westfield High School 550 Dorian Road Westfield, New Jersey 07090	_____ , (___)___-_____	____ _____ , (___)___-_____ _____

Property ID: 4561659

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
47.7 kBtu/ft²

Source EUI
80.1 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	10,060,199 (70%)
Electric - Grid (kBtu)	4,345,274 (30%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	70.9
National Median Source EUI (kBtu/ft²)	119.1
% Diff from National Median Source EUI	-33%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	1,116

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(___)___-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

85

ENERGY STAR® Score

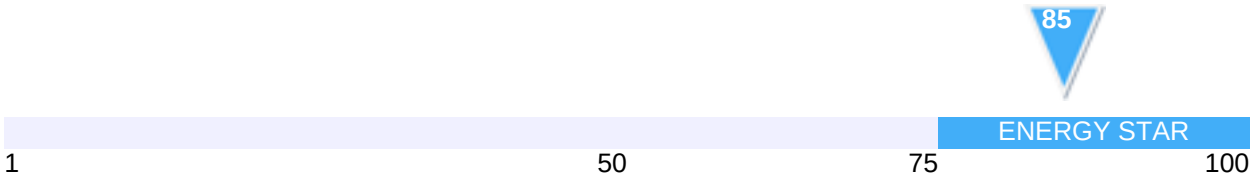
Westfield High School

Primary Function: K-12 School
Gross Floor Area (ft²): 302,300
Built: 1925

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Westfield High School
550 Dorian Road
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 80.1 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

85

ENERGY STAR® Score[1]

Westfield High School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 302,300
Built: 1925

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Westfield High School
550 Dorian Road
Westfield, New Jersey 07090

Property ID: 4561659

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

		Progress		Performance Goals		
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	85	85	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	47.7	47.7	0	N/A	70.9	55.4
Source EUI (kBtu/ft²)	80.1	80.1	0	N/A	119.1	93.2
$	306,724.32	306,724.32	0	N/A	456,326.04	356,856.26
$/ft²	1.01	1.01	0	N/A	1.51	1.18
Greenhouse Gas Emissions						
Metric Tons CO2e/year	1,116	1,116	0	N/A	1,660.4	1,298.4
kgCO2e/ ft2/year	3.7	3.7	0	N/A	5.5	4.3
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

85

ENERGY STAR® Score[1]

Roosevelt Intermediate School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 112,900
Built: 1925

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Roosevelt Intermediate School
301 Clark Street
Westfield, New Jersey 07090

Property ID: 4561660

Property Owner
_____
,
(____)____-_____

Primary Contact
____ _____
,
(____)____-_____
_____

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
55.8 kBtu/ft²

Source EUI
91.7 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	4,503,698 (72%)
Electric - Grid (kBtu)	1,792,208 (28%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	83
National Median Source EUI (kBtu/ft²)	136.5
% Diff from National Median Source EUI	-33%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	479

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

85

ENERGY STAR® Score

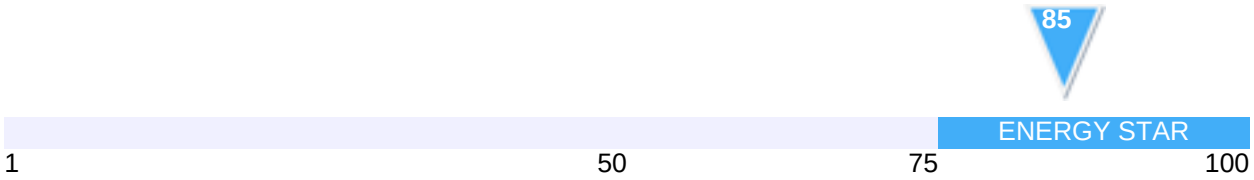
Roosevelt Intermediate School

Primary Function: K-12 School
Gross Floor Area (ft²): 112,900
Built: 1925

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Roosevelt Intermediate School
301 Clark Street
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 91.7 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

85

ENERGY STAR® Score[1]

Roosevelt Intermediate School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 112,900
Built: 1925

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Roosevelt Intermediate School
301 Clark Street
Westfield, New Jersey 07090

Property ID: 4561660

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

		Progress		Performance Goals		
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	85	85	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	55.8	55.8	0	N/A	83	64.9
Source EUI (kBtu/ft²)	91.7	91.7	0	N/A	136.5	106.8
$	124,026.23	124,026.23	0	N/A	184,586.26	144,350.29
$/ft²	1.1	1.1	0	N/A	1.63	1.28
Greenhouse Gas Emissions						
Metric Tons CO2e/year	479.1	479.1	0	N/A	713.1	557.6
kgCO2e/ ft2/year	4.2	4.2	0	N/A	6.3	4.9
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

95

ENERGY STAR® Score[1]

McKinley Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 61,140
Built: 1908

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
McKinley Elementary School 500 First Street Westfield, New Jersey 07090	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4561661

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
55.1 kBtu/ft²

Source EUI
77.2 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	2,799,800 (83%)
Electric - Grid (kBtu)	567,750 (17%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	105.1
National Median Source EUI (kBtu/ft²)	147.3
% Diff from National Median Source EUI	-48%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	225

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

95

ENERGY STAR® Score

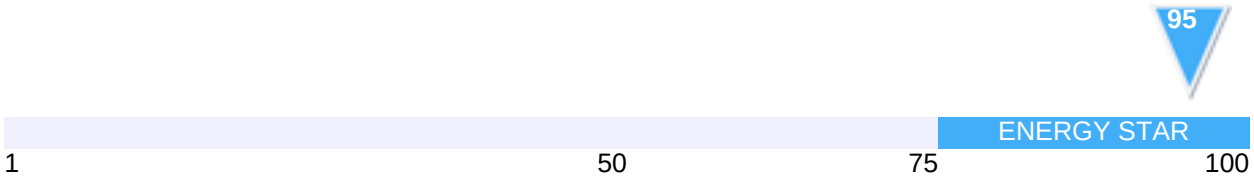
McKinley Elementary School

Primary Function: K-12 School
Gross Floor Area (ft²): 61,140
Built: 1908

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
McKinley Elementary School
500 First Street
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 77.2 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

95

ENERGY STAR® Score[1]

McKinley Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 61,140
Built: 1908

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
McKinley Elementary School
500 First Street
Westfield, New Jersey 07090

Property ID: 4561661

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

		Progress		Performance Goals		
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	95	95	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	55.1	55.1	0	N/A	105.1	82.2
Source EUI (kBtu/ft²)	77.2	77.2	0	N/A	147.3	115.2
$	53,176.39	53,176.39	0	N/A	101,442.05	79,329.76
$/ft²	0.87	0.87	0	N/A	1.66	1.3
Greenhouse Gas Emissions						
Metric Tons CO2e/year	224.7	224.7	0	N/A	428.7	335.2
kgCO2e/ ft2/year	3.7	3.7	0	N/A	7	5.5
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

99

ENERGY STAR® Score[1]

Administration Building

Primary Property Function: K-12 School
Gross Floor Area (ft²): 60,000
Built: 1914

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Administration Building 302 Elm Street Westfield, New Jersey 07090	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4561662

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
43.1 kBtu/ft²

Source EUI
63.5 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	2,061,500 (80%)
Electric - Grid (kBtu)	523,674 (20%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	100.2
National Median Source EUI (kBtu/ft²)	147.7
% Diff from National Median Source EUI	-57%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	180

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

99

ENERGY STAR® Score

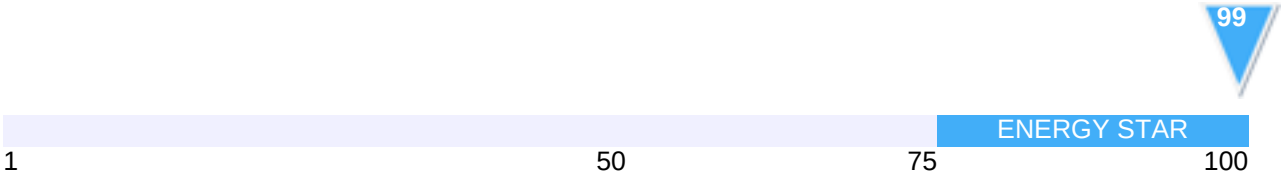
Administration Building

Primary Function: K-12 School
Gross Floor Area (ft²): 60,000
Built: 1914

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Administration Building
302 Elm Street
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 63.5 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

99

ENERGY STAR® Score[1]

Administration Building

Primary Property Function: K-12 School
Gross Floor Area (ft²): 60,000
Built: 1914

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Administration Building
302 Elm Street
Westfield, New Jersey 07090

Property ID: 4561662

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

	Progress			Performance Goals		
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	99	99	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	43.1	43.1	0	N/A	100.2	78.4
Source EUI (kBtu/ft²)	63.5	63.5	0	N/A	147.7	115.5
$	44,651.37	44,651.37	0	N/A	103,875.07	81,232.45
$/ft²	0.74	0.74	0	N/A	1.73	1.35
Greenhouse Gas Emissions						
Metric Tons CO2e/year	179.6	179.6	0	N/A	417.8	326.7
kgCO2e/ ft2/year	3	3	0	N/A	7	5.4
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

96

ENERGY STAR® Score[1]

Edison Intermediate School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 124,900
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Edison Intermediate School 800 Rahway Avenue Westfield, New Jersey 07090	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4561663

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
42.2 kBtu/ft²

Source EUI
69.7 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	3,756,799 (71%)
Electric - Grid (kBtu)	1,514,300 (29%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	81.6
National Median Source EUI (kBtu/ft²)	134.7
% Diff from National Median Source EUI	-48%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	402

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

96

ENERGY STAR® Score

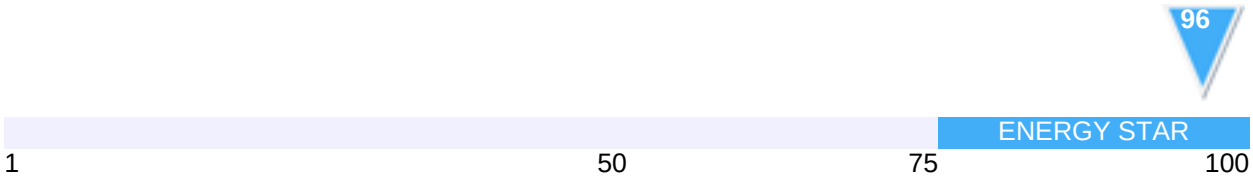
Edison Intermediate School

Primary Function: K-12 School
Gross Floor Area (ft²): 124,900
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Edison Intermediate School
800 Rahway Avenue
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 69.7 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

96

ENERGY STAR® Score[1]

Edison Intermediate School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 124,900
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Edison Intermediate School
800 Rahway Avenue
Westfield, New Jersey 07090

Property ID: 4561663

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

		Progress			Performance Goals	
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	96	96	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	42.2	42.2	0	N/A	81.6	63.8
Source EUI (kBtu/ft²)	69.7	69.7	0	N/A	134.7	105.4
$	106,289.93	106,289.93	0	N/A	205,612.46	160,793.18
$/ft²	0.85	0.85	0	N/A	1.65	1.29
Greenhouse Gas Emissions						
Metric Tons CO2e/year	402.3	402.3	0	N/A	778.1	608.5
kgCO2e/ ft2/year	3.2	3.2	0	N/A	6.2	4.9
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

64

ENERGY STAR® Score[1]

Lincoln Elementary School (WF)

Primary Property Function: K-12 School
Gross Floor Area (ft²): 26,980
Built: 1922

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Lincoln Elementary School (WF) 728 Westfield Avenue Westfield, New Jersey 07090	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4561665

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
66.1 kBtu/ft²

Source EUI
141.8 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	848,900 (48%)
Electric - Grid (kBtu)	934,888 (52%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	75.4
National Median Source EUI (kBtu/ft²)	161.8
% Diff from National Median Source EUI	-12%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	170

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

64

ENERGY STAR® Score

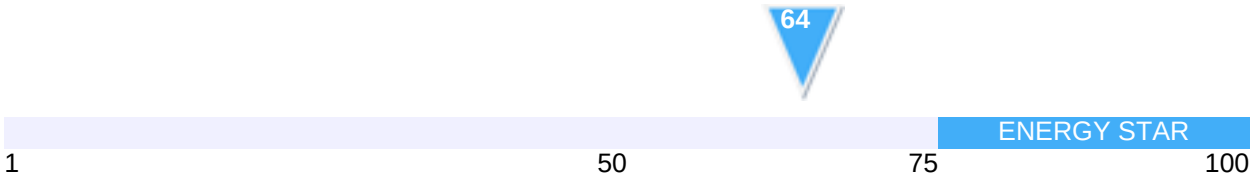
Lincoln Elementary School (WF)

Primary Function: K-12 School
Gross Floor Area (ft²): 26,980
Built: 1922

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Lincoln Elementary School (WF)
728 Westfield Avenue
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 141.8 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

64

ENERGY STAR® Score[1]

Lincoln Elementary School (WF)

Primary Property Function: K-12 School
Gross Floor Area (ft²): 26,980
Built: 1922

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Lincoln Elementary School (WF)
728 Westfield Avenue
Westfield, New Jersey 07090

Property ID: 4561665

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

		Progress		Performance Goals		
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	64	64	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	66.1	66.1	0	N/A	75.4	59
Source EUI (kBtu/ft²)	141.8	141.8	0	N/A	161.8	126.5
$	53,415.63	53,415.63	0	N/A	60,928.33	47,647.19
$/ft²	1.98	1.98	0	N/A	2.26	1.77
Greenhouse Gas Emissions						
Metric Tons CO2e/year	170.2	170.2	0	N/A	194.2	151.9
kgCO2e/ ft2/year	6.3	6.3	0	N/A	7.2	5.6
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

50

ENERGY STAR® Score[1]

Kehler Stadium Field House

Primary Property Function: K-12 School
Gross Floor Area (ft²): 5,000
Built: 2000

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Kehler Stadium Field House 748 Rahway Avenue Westfield, New Jersey 07090	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4561666

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
134.9 kBtu/ft²

Source EUI
191.4 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	555,700 (82%)
Electric - Grid (kBtu)	118,881 (18%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	135.1
National Median Source EUI (kBtu/ft²)	191.5
% Diff from National Median Source EUI	-0%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	45

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

50

ENERGY STAR® Score

Kehler Stadium Field House

Primary Function: K-12 School
Gross Floor Area (ft²): 5,000
Built: 2000

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Kehler Stadium Field House
748 Rahway Avenue
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 191.4 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

50

ENERGY STAR® Score[1]

Kehler Stadium Field House

Primary Property Function: K-12 School
Gross Floor Area (ft²): 5,000
Built: 2000

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Kehler Stadium Field House
748 Rahway Avenue
Westfield, New Jersey 07090

Property ID: 4561666

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

	Progress			Performance Goals		
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	50	50	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	134.9	134.9	0	N/A	135.1	105.6
Source EUI (kBtu/ft²)	191.4	191.4	0	N/A	191.5	149.8
$	11,107.37	11,107.37	0	N/A	11,118.69	8,695.05
$/ft²	2.22	2.22	0	N/A	2.22	1.74
Greenhouse Gas Emissions						
Metric Tons CO2e/year	45.4	45.4	0	N/A	45.5	35.6
kgCO2e/ ft2/year	9.1	9.1	0	N/A	9.1	7.1
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

95

ENERGY STAR® Score[1]

Franklin Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 65,800
Built: 1930

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Franklin Elementary School 700 Prospect Street Westfield, New Jersey 07090	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4561667

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
55.2 kBtu/ft²

Source EUI
78.7 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	2,978,600 (82%)
Electric - Grid (kBtu)	652,364 (18%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	102.5
National Median Source EUI (kBtu/ft²)	146.1
% Diff from National Median Source EUI	-46%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	246

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
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(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

95

ENERGY STAR® Score

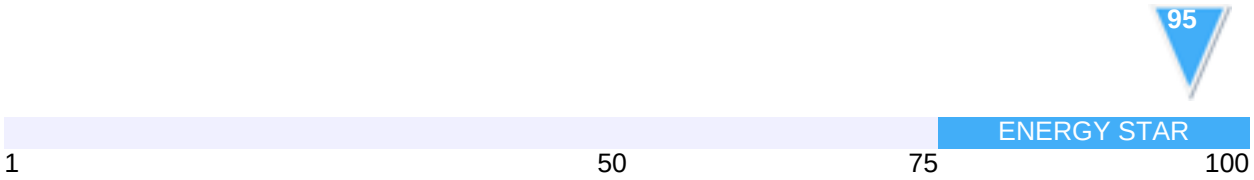
Franklin Elementary School

Primary Function: K-12 School
Gross Floor Area (ft²): 65,800
Built: 1930

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Franklin Elementary School
700 Prospect Street
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 78.7 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

95

ENERGY STAR® Score[1]

Franklin Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 65,800
Built: 1930

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Franklin Elementary School
700 Prospect Street
Westfield, New Jersey 07090

Property ID: 4561667

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

	Progress			Performance Goals		
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	95	95	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	55.2	55.2	0	N/A	102.5	80.1
Source EUI (kBtu/ft²)	78.7	78.7	0	N/A	146.1	114.2
$	60,394.14	60,394.14	0	N/A	112,134.52	87,691.5
$/ft²	0.92	0.92	0	N/A	1.7	1.33
Greenhouse Gas Emissions						
Metric Tons CO2e/year	245.5	245.5	0	N/A	455.9	356.5
kgCO2e/ ft2/year	3.7	3.7	0	N/A	6.9	5.4
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

99

ENERGY STAR® Score[1]

Tamaques Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 48,350
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Tamaques Elementary School 641 Willow Grove Road Westfield, New Jersey 07090	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4561668

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
33.2 kBtu/ft²

Source EUI
60.9 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	1,003,600 (62%)
Electric - Grid (kBtu)	602,338 (38%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	82.6
National Median Source EUI (kBtu/ft²)	151.5
% Diff from National Median Source EUI	-60%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	134

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

99

ENERGY STAR® Score

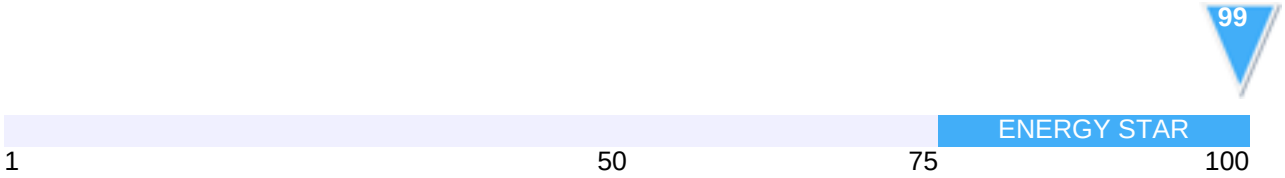
Tamaques Elementary School

Primary Function: K-12 School
Gross Floor Area (ft²): 48,350
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Tamaques Elementary School
641 Willow Grove Road
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 60.9 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

99

ENERGY STAR® Score[1]

Tamaques Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 48,350
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Tamaques Elementary School
641 Willow Grove Road
Westfield, New Jersey 07090

Property ID: 4561668

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

	Progress			Performance Goals		
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	99	99	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	33.2	33.2	0	N/A	82.6	64.6
Source EUI (kBtu/ft²)	60.9	60.9	0	N/A	151.5	118.5
$	41,573.22	41,573.22	0	N/A	103,394.76	80,856.79
$/ft²	0.86	0.86	0	N/A	2.14	1.67
Greenhouse Gas Emissions						
Metric Tons CO2e/year	133.9	133.9	0	N/A	333.1	260.5
kgCO2e/ ft2/year	2.8	2.8	0	N/A	6.9	5.4
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

ENERGY STAR® Statement of Energy Performance

99

ENERGY STAR® Score[1]

Washington Elementary School (WF)

Primary Property Function: K-12 School
Gross Floor Area (ft²): 36,050
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Washington Elementary School (WF) 900 St. Marks Avenue Westfield, New Jersey 07090	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4561670

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
29 kBtu/ft²

Source EUI
60.8 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	519,200 (50%)
Electric - Grid (kBtu)	524,650 (50%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	74.6
National Median Source EUI (kBtu/ft²)	156.7
% Diff from National Median Source EUI	-61%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	98

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
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(____)____-_____
_____

Professional Engineer Stamp (if applicable)

ENERGY STAR® Scorecard

99

ENERGY STAR® Score

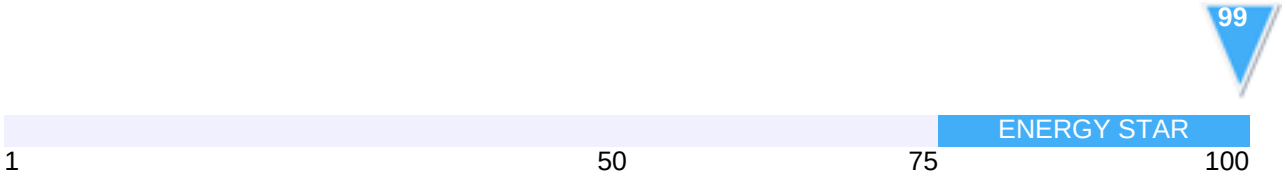
Washington Elementary School (WF)

Primary Function: K-12 School
Gross Floor Area (ft²): 36,050
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Washington Elementary School (WF)
900 St. Marks Avenue
Westfield, New Jersey 07090

For the year ending in July 2015, this building used 60.8 (kBtu/ft²) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



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

Signature of Verifying Professional

I _____ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: _____Date: _____

ENERGY STAR® Progress & Goals Report

99

ENERGY STAR® Score[1]

Washington Elementary School (WF)

Primary Property Function: K-12 School
Gross Floor Area (ft²): 36,050
Built: 1953

For Year Ending: July 31, 2015
Date Generated: October 19, 2015

Property Address:
Washington Elementary School (WF)
900 St. Marks Avenue
Westfield, New Jersey 07090

Property ID: 4561670

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

		Progress			Performance Goals	
	Year Ending 7/31/2015 (Baseline)	**Year Ending 7/31/2015** (Selected)	**% Change**	**Property's Target**	**National Median**	**ENERGY STAR Score of 75**
ENERGY STAR Score	99	99	0	N/A	50	75
Energy						
Site EUI (kBtu/ft²)	29	29	0	N/A	74.6	58.3
Source EUI (kBtu/ft²)	60.8	60.8	0	N/A	156.7	122.5
$	33,657.68	33,657.68	0	N/A	86,703.7	67,804.1
$/ft²	0.93	0.93	0	N/A	2.41	1.88
Greenhouse Gas Emissions						
Metric Tons CO2e/year	97.8	97.8	0	N/A	252	197
kgCO2e/ ft2/year	2.7	2.7	0	N/A	7	5.5
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft²)	N/A	N/A	N/A	*	*	*
$	N/A	N/A	N/A	*	*	*

*Setting and managing water targets is not yet available in Portfolio Manager.

Appendix C

Combined heat and power Analysis	- (system usage) + (system production)					
Westfield High School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.41	$15.55	$8.14
Hourly Boiler Production **	0	-5	408	-$4.49	$5.71	$1.22
Annual Hours of Generator operation		4320		-$32,009	-36,374	therms
Electrical used		100%		$50,544	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$26,851		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**4.1**		

Utility Cost	
Therm	$0.88
kWh	$0.18
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient
*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
Roosevelt Intermediate School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.41	$15.55	$8.14
Hourly Boiler Production **	0	-5	408	-$4.49	$5.71	$1.22
Annual Hours of Generator operation		4320		-$33,464	-36,374	therms
Electrical used		100%		$50,544	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$25,396		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**4.4**		

Utility Cost	
Therm	$0.92
kWh	$0.18
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient
*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
Jefferson Elementary School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.41	$15.55	$8.14
Hourly Boiler Production **	0	-5	408	-$4.49	$5.71	$1.22
Annual Hours of Generator operation		4320		-$34,556	-36,374	therms
Electrical used		100%		$50,544	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$24,304		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**4.6**		

Utility Cost	
Therm	$0.95
kWh	$0.18
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient
*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw

Combined heat and power Analysis	- (system usage) + (system production)					
Washington Elementary School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$12.04	$16.20	$4.16
Hourly Boiler Production **	0	-5	408	-$7.29	$5.71	-$1.58
Annual Hours of Generator operation		4320		-$52,015	-36,374	therms
Electrical used		100%		$53,352	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$9,653		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**14.0**		

Utility Cost	
Therm	$1.43
kWh	$0.19
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient
*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw

Combined heat and power Analysis	- (system usage) + (system production)					
Edison Intermediate School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.41	$15.55	$8.14
Hourly Boiler Production **	0	-5	408	-$4.49	$5.71	$1.22
Annual Hours of Generator operation		4320		-$37,829	-36,374	therms
Electrical used		100%		$44,928	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$15,415		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**7.8**		

Utility Cost	
Therm	$1.04
kWh	$0.16
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient

*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
Franklin Elementary School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.41	$15.55	$8.14
Hourly Boiler Production **	0	-5	408	-$4.49	$5.71	$1.22
Annual Hours of Generator operation		4320		-$31,282	-36,374	therms
Electrical used		100%		$53,352	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$30,386		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**3.6**		

Utility Cost	
Therm	$0.86
kWh	$0.19
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient

*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
Lincoln Elementary School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.41	$15.55	$8.14
Hourly Boiler Production **	0	-5	408	-$4.49	$5.71	$1.22
Annual Hours of Generator operation		4320		-$33,101	-36,374	therms
Electrical used		100%		$50,544	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$25,759		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**4.3**		

Utility Cost	
Therm	$0.91
kWh	$0.18
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient
*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
Kehler Stadium Field House	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$12.04	$16.20	$4.16
Hourly Boiler Production **	0	-5	408	-$7.29	$5.71	-$1.58
Annual Hours of Generator operation		4320		-$34,192	-36,374	therms
Electrical used		100%		$50,544	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$24,668		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**4.5**		

Utility Cost	
Therm	$0.94
kWh	$0.18
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient
*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
McKinley Elementary School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.58	$14.90	$7.32
Hourly Boiler Production **	0	-5	408	-$4.59	$5.71	$1.12
Annual Hours of Generator operation		4320		-$32,737	-36,374	therms
Electrical used		100%		$47,736	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$23,315		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**4.8**		

Utility Cost	
Therm	$0.90
kWh	$0.17
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient
*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
Wilson Elementary School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.58	$14.90	$7.32
Hourly Boiler Production **	0	-5	408	-$4.59	$5.71	$1.12
Annual Hours of Generator operation		4320		-$30,554	-36,374	therms
Electrical used		100%		$53,352	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$31,114		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**3.5**		

Utility Cost	
Therm	$0.84
kWh	$0.19
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient
*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
Tamaques Elementary School	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.58	$14.90	$7.32
Hourly Boiler Production **	0	-5	408	-$4.59	$5.71	$1.12
Annual Hours of Generator operation		4320		-$33,101	-36,374	therms
Electrical used		100%		$50,544	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$25,759		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**4.3**		

Utility Cost	
Therm	$0.91
kWh	$0.18
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient

*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Combined heat and power Analysis	- (system usage) + (system production)					
Administration Building	**kwh**	**Therms**	**Kbtuh**	**$ Cost**	**$ Produced**	**$ Net**
Hourly Generator Production*	65	-8	275	-$7.58	$14.90	$7.32
Hourly Boiler Production **	0	-5	408	-$4.59	$5.71	$1.12
Annual Hours of Generator operation		4320		-$30,191	-36,374	therms
Electrical used		100%		$50,544	280,800	kWh
Thermal used		50%		$8,316	594,000	kBtuh
			Annual Generator Savings	$28,669		
			Estimate Cost of 65 kW Generator	$143,000		
			Incentive	$42,900		
			Final Cost	$100,100		
			Annual Maintenance***	$2,527		
			Simple Payback	**3.8**		

Utility Cost	
Therm	$0.83
kWh	$0.18
kBtuh	$0.01

* Based upon 65 kW generator
** Based upon existing plant running on Natural Gas at the plant measured 80% efficient

*** $0.009/kWh operation and maintenance cost (National Renewable Energy Laboratory 2003 data for 1 Mw system)

Domestic Hot Water Analysis

Building Name	Washington Elementary School	
Building Squarefootage	36,050	sqft
Water Heater Count	1	

Baseline		
Baseline DHW System Fuel	Therm	100,000 btu
Baseline squarefeet per Person	123	
Baseline Usage per Person per Day	5.0	gallons
Baseline People	293	
Baseline Building Usage per Day	1,463	gallons
Baseline Building Usage Per Year	534,020	gallons
Baseline DHW System Efficiency	80%	
Estimated cold water temperature	50	°F
Estimated hot water temperature	120	°F
Temperature Rise	70.0	°F
Heater output required	311.4	mmbtu
Heater input required	389.2	mmbtu
Heater Fuel Usage	3,892	Therm
Estimated Usage Per Heater	3,892	Therm

? -20

Proposed		
Baseline DHW System Fuel	Therm	100,000 btu
Baseline squarefeet per Person	123	
Baseline Usage per Person per Day	5.0	gallons
Baseline People	293	
Baseline Building Usage per Day	1,463	gallons
Baseline Building Usage Per Year	534,020	gallons
Baseline DHW System Efficiency	95%	
Estimated cold water temperature	50	°F
Estimated hot water temperature	120	°F
Temperature Rise	70.0	°F
Heater output required	311.4	mmbtu
Heater input required	327.8	mmbtu
Heater Fuel Usage	3,278	Therm

WindCad Turbine Performance Model

Endurance S-343 Wind Turbine, Grid - Intertie

Prepared For:	**Westfield BOE**
Site Location:	**Westfield, NJ**
Data Source:	**NASA Atmospheric Science Data Center**
Date:	**10/16/2015**

35 kW

Inputs:

Ave. Wind (m/s) =	3
Weibull K =	1
Site Altitude (m) =	0
Wind Shear Exp. =	0.180
Anem. Height (m) =	42.7
Tower Height (m) =	42.7
Turbulence Factor =	2.0%

Results:

Hub Average Wind Speed (m/s) =	3.00
Air Density Factor =	0%
Average Output Power (kW) =	6.32
Daily Energy Output (kWh) =	151.6
Annual Energy Output (kWh) =	**55,334**
Monthly Energy Output =	4,611
Percent Operating Time =	35.0%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	22.05%	0.000
2	0.00	16.39%	0.000
3	0.00	12.18%	0.000
4	2.45	9.06%	0.222
5	7.45	6.73%	0.501
6	14.70	5.00%	0.735
7	24.50	3.72%	0.911
8	35.28	2.76%	0.975
9	38.22	2.05%	0.785
10	38.22	1.53%	0.584
11	38.22	1.14%	0.434
12	38.22	0.84%	0.322
13	38.22	0.63%	0.240
14	38.22	0.47%	0.178
15	38.22	0.35%	0.132
16	38.22	0.26%	0.098
17	38.22	0.19%	0.073
18	38.22	0.14%	0.054
19	38.22	0.11%	0.040
20	38.22	0.08%	0.030
2008, BWC	Totals:	85.67%	6.317

Weibull Calculations:
Wind speed probability is calculated as a Weibull curve defined by the average wind speed and a shape factor, K. To facilitate piece-wise integration, the wind speed range is broken down into "bins" of 1 m/s in width (Column 1). For each wind speed bin, instantaneous wind turbine power (W, Column 2)) is multiplied by the Weibull wind speed probability (f, Column 3). This cross product (Net W, Column 4) is the contribution to average turbine power output contributed by wind speeds in that bin. The sum of these contributions is the average power output of the turbine on a continuous, 24 hour, basis.
Best results are achieved using annual or monthly average wind speeds. Use of daily or hourly average speeds is not recommended.

Table 1. Annual Costs

Component	High School ($)	High School Upgrade ($)
Air System Fans	6,837	6,837
Cooling	7,483	7,483
Heating	88,013	74,227
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**102,332**	**88,547**
Lights	109,124	109,124
Electric Equipment	6,563	6,563
Misc. Electric	7,892	7,892
Misc. Fuel Use	3,738	3,738
Non-HVAC Sub-Total	**127,318**	**127,318**
Grand Total	**229,650**	**215,865**

Table 2. Annual Cost per Unit Floor Area

Component	High School ($/ft²)	High School Upgrade ($/ft²)
Air System Fans	0.023	0.023
Cooling	0.025	0.025
Heating	0.291	0.246
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.339**	**0.293**
Lights	0.361	0.361
Electric Equipment	0.022	0.022
Misc. Electric	0.026	0.026
Misc. Fuel Use	0.012	0.012
Non-HVAC Sub-Total	**0.421**	**0.421**
Grand Total	**0.760**	**0.714**
Gross Floor Area (ft²)	302303.0	302303.0
Conditioned Floor Area (ft²)	302303.0	302303.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	High School (%)	High School Upgrade (%)
Air System Fans	3.0	3.2
Cooling	3.3	3.5
Heating	38.3	34.4
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**44.6**	**41.0**
Lights	47.5	50.6
Electric Equipment	2.9	3.0
Misc. Electric	3.4	3.7
Misc. Fuel Use	1.6	1.7
Non-HVAC Sub-Total	**55.4**	**59.0**
Grand Total	**100.0**	**100.0**

Table 1. Annual Costs

Component	High School ($)	High School Upgrade ($)
HVAC Components		
Electric	14,320	14,320
Natural Gas	88,013	74,227
Fuel Oil	0	0
Propane	0	0
Remote HW	0	0
Remote Steam	0	0
Remote CW	0	0
HVAC Sub-Total	**102,332**	**88,547**
Non-HVAC Components		
Electric	123,579	123,579
Natural Gas	3,738	3,738
Fuel Oil	0	0
Propane	0	0
Remote HW	0	0
Remote Steam	0	0
Non-HVAC Sub-Total	**127,317**	**127,317**
Grand Total	**229,650**	**215,864**

Table 2. Annual Energy Consumption

Component	High School	High School Upgrade
HVAC Components		
Electric (kWh)	119,330	119,330
Natural Gas (Therm)	97,792	82,475
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Remote CW (na)	0	0
Non-HVAC Components		
Electric (kWh)	1,029,828	1,029,828
Natural Gas (Therm)	4,153	4,153
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Totals		
Electric (kWh)	1,149,158	1,149,158
Natural Gas (Therm)	101,945	86,628
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Remote CW (na)	0	0

Table 3. Annual Emissions

Component	High School	High School Upgrade
CO2 Equivalent (lb)	0	0

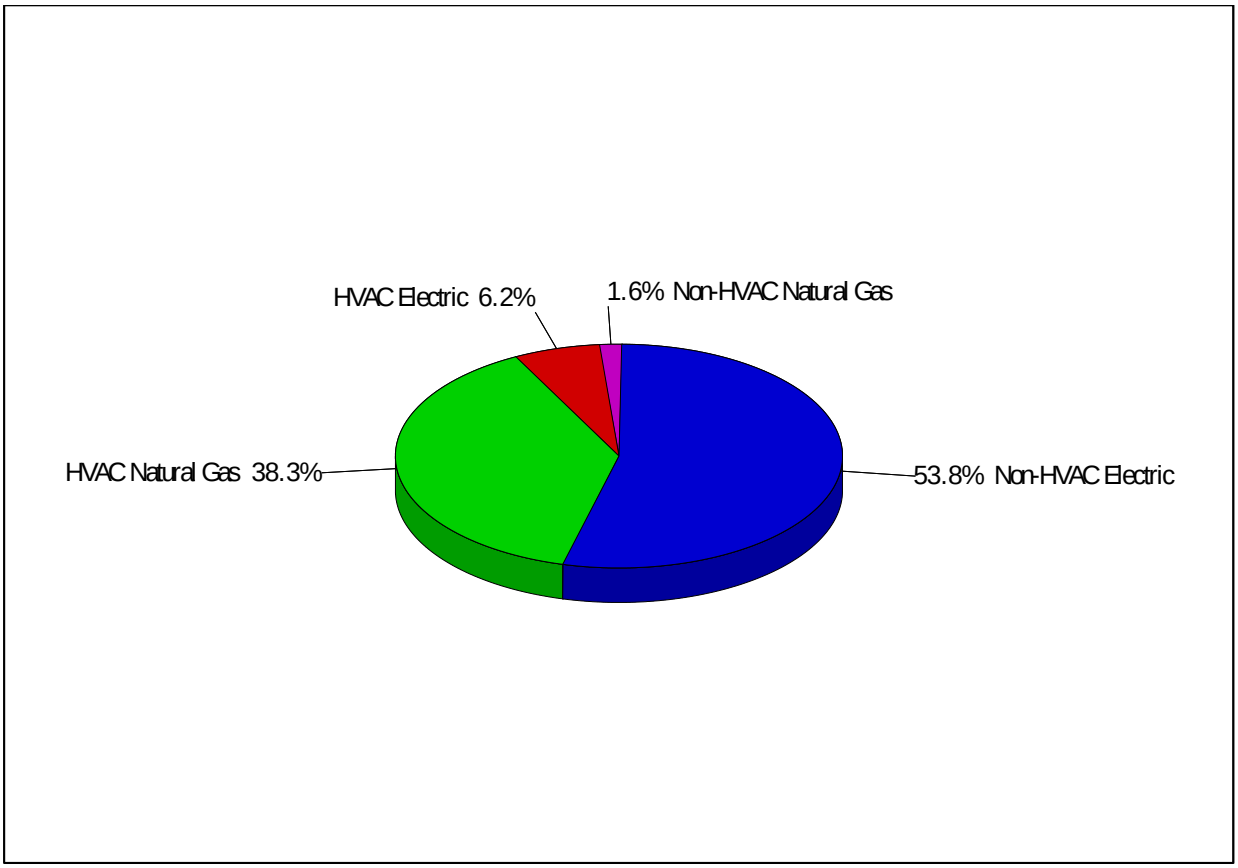
Table 4. Annual Cost per Unit Floor Area

Component	High School ($/ft²)	High School Upgrade ($/ft²)
HVAC Components		
Electric	0.047	0.047
Natural Gas	0.291	0.246
Fuel Oil	0.000	0.000
Propane	0.000	0.000
Remote HW	0.000	0.000
Remote Steam	0.000	0.000
Remote CW	0.000	0.000
HVAC Sub-Total	**0.339**	**0.293**
Non-HVAC Components		
Electric	0.409	0.409
Natural Gas	0.012	0.012
Fuel Oil	0.000	0.000
Propane	0.000	0.000
Remote HW	0.000	0.000
Remote Steam	0.000	0.000
Non-HVAC Sub-Total	**0.421**	**0.421**
Grand Total	**0.760**	**0.714**
Gross Floor Area (ft²)	302303.0	302303.0
Conditioned Floor Area (ft²)	302303.0	302303.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 5. Component Cost as a Percentage of Total Cost

Component	High School (%)	High School Upgrade (%)
HVAC Components		
Electric	6.2	6.6
Natural Gas	38.3	34.4
Fuel Oil	0.0	0.0
Propane	0.0	0.0
Remote HW	0.0	0.0
Remote Steam	0.0	0.0
Remote CW	0.0	0.0
HVAC Sub-Total	**44.6**	**41.0**
Non-HVAC Components		
Electric	53.8	57.2
Natural Gas	1.6	1.7
Fuel Oil	0.0	0.0
Propane	0.0	0.0
Remote HW	0.0	0.0
Remote Steam	0.0	0.0
Non-HVAC Sub-Total	**55.4**	**59.0**
Grand Total	**100.0**	**100.0**



1. Annual Costs

Component	Annual Cost ($/yr)	($/ft²)	Percent of Total (%)
HVAC Components			
Electric	14,320	0.047	6.2
Natural Gas	88,013	0.291	38.3
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Remote Chilled Water	0	0.000	0.0
HVAC Sub-Total	**102,332**	**0.339**	**44.6**
Non-HVAC Components			
Electric	123,579	0.409	53.8
Natural Gas	3,738	0.012	1.6
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Non-HVAC Sub-Total	**127,317**	**0.421**	**55.4**
Grand Total	**229,650**	**0.760**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **302303.0** ft²
Conditioned Floor Area ..... **302303.0** ft²

Monthly Energy Use by Energy Type - High School

High School Upgrade
CDM Smith

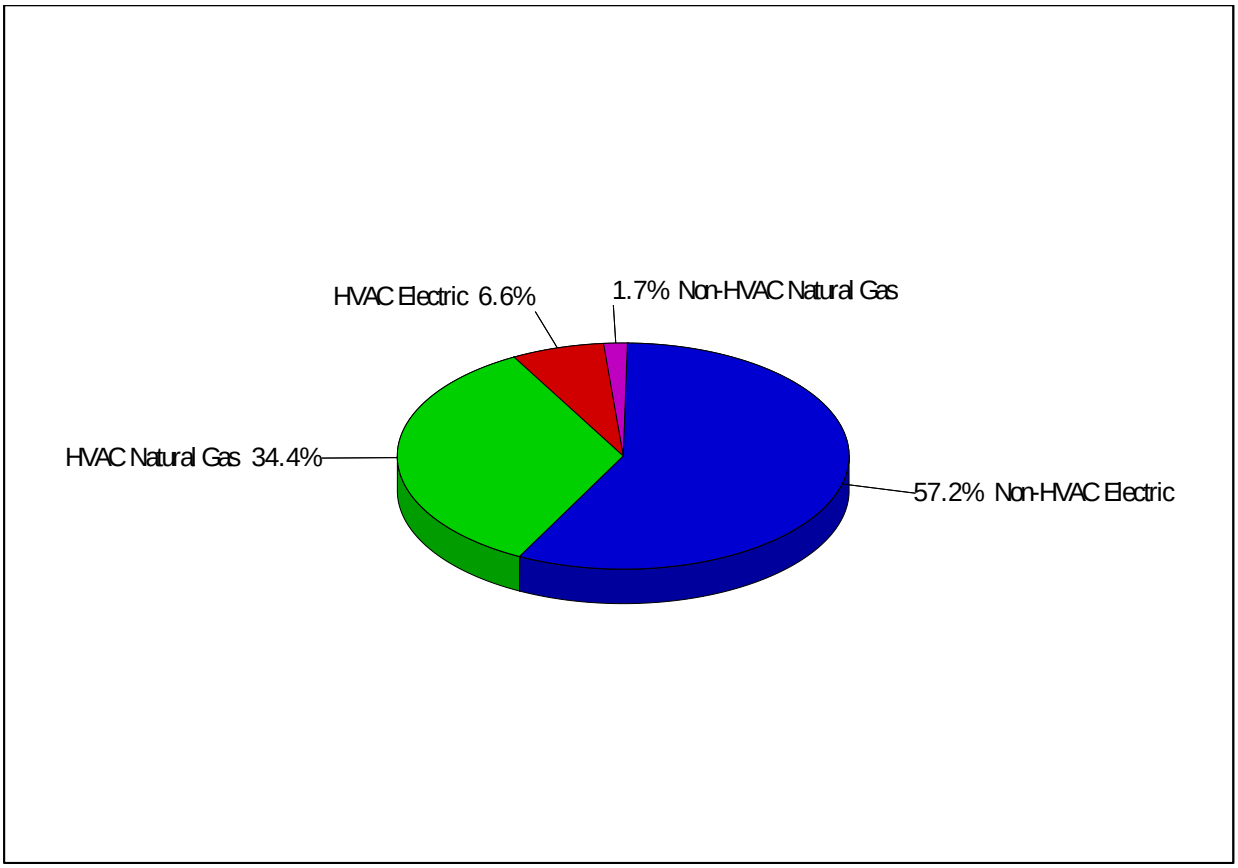
10/20/2015
09:10AM

1. HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)	Remote CW (na)
Jan	8,772	26,354	0	0	0	0	0
Feb	7,935	17,233	0	0	0	0	0
Mar	8,537	12,752	0	0	0	0	0
Apr	10,008	8,076	0	0	0	0	0
May	13,985	0	0	0	0	0	0
Jun	15,052	0	0	0	0	0	0
Jul	4,981	0	0	0	0	0	0
Aug	4,640	0	0	0	0	0	0
Sep	14,987	0	0	0	0	0	0
Oct	12,526	4,510	0	0	0	0	0
Nov	8,821	10,125	0	0	0	0	0
Dec	9,085	18,742	0	0	0	0	0
Totals	119,330	97,792	0	0	0	0	0

2. Non-HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)
Jan	90,146	364	0	0	0	0
Feb	78,930	318	0	0	0	0
Mar	83,708	337	0	0	0	0
Apr	86,407	349	0	0	0	0
May	87,024	351	0	0	0	0
Jun	83,092	335	0	0	0	0
Jul	90,146	364	0	0	0	0
Aug	83,708	337	0	0	0	0
Sep	86,407	349	0	0	0	0
Oct	90,146	364	0	0	0	0
Nov	79,970	322	0	0	0	0
Dec	90,146	364	0	0	0	0
Totals	1,029,828	4,153	0	0	0	0



1. Annual Costs

Component	Annual Cost ($/yr)	($/ft²)	Percent of Total (%)
HVAC Components			
Electric	14,320	0.047	6.6
Natural Gas	74,227	0.246	34.4
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Remote Chilled Water	0	0.000	0.0
HVAC Sub-Total	**88,547**	**0.293**	**41.0**
Non-HVAC Components			
Electric	123,579	0.409	57.2
Natural Gas	3,738	0.012	1.7
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Non-HVAC Sub-Total	**127,317**	**0.421**	**59.0**
Grand Total	**215,864**	**0.714**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **302303.0** ft²
Conditioned Floor Area ..... **302303.0** ft²

Monthly Energy Use by Energy Type - High School Upgrade

High School Upgrade 10/20/2015
CDM Smith 09:10AM

1. HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)	Remote CW (na)
Jan	8,772	22,226	0	0	0	0	0
Feb	7,935	14,534	0	0	0	0	0
Mar	8,537	10,755	0	0	0	0	0
Apr	10,008	6,811	0	0	0	0	0
May	13,985	0	0	0	0	0	0
Jun	15,052	0	0	0	0	0	0
Jul	4,981	0	0	0	0	0	0
Aug	4,640	0	0	0	0	0	0
Sep	14,987	0	0	0	0	0	0
Oct	12,526	3,803	0	0	0	0	0
Nov	8,821	8,539	0	0	0	0	0
Dec	9,085	15,806	0	0	0	0	0
Totals	119,330	82,475	0	0	0	0	0

2. Non-HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)
Jan	90,146	364	0	0	0	0
Feb	78,930	318	0	0	0	0
Mar	83,708	337	0	0	0	0
Apr	86,407	349	0	0	0	0
May	87,024	351	0	0	0	0
Jun	83,092	335	0	0	0	0
Jul	90,146	364	0	0	0	0
Aug	83,708	337	0	0	0	0
Sep	86,407	349	0	0	0	0
Oct	90,146	364	0	0	0	0
Nov	79,970	322	0	0	0	0
Dec	90,146	364	0	0	0	0
Totals	1,029,828	4,153	0	0	0	0

Table 1. Annual Costs

Component	Jefferson ($)	Jefferson Upgrade ($)
Air System Fans	1,937	1,937
Cooling	3,152	3,152
Heating	21,634	18,245
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**26,724**	**23,335**
Lights	15,310	15,310
Electric Equipment	1,244	1,244
Misc. Electric	733	733
Misc. Fuel Use	2,635	2,635
Non-HVAC Sub-Total	**19,922**	**19,922**
Grand Total	**46,646**	**43,257**

Table 2. Annual Cost per Unit Floor Area

Component	Jefferson ($/ft²)	Jefferson Upgrade ($/ft²)
Air System Fans	0.041	0.041
Cooling	0.066	0.066
Heating	0.452	0.381
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.559**	**0.488**
Lights	0.320	0.320
Electric Equipment	0.026	0.026
Misc. Electric	0.015	0.015
Misc. Fuel Use	0.055	0.055
Non-HVAC Sub-Total	**0.416**	**0.416**
Grand Total	**0.975**	**0.904**
Gross Floor Area (ft²)	47852.0	47852.0
Conditioned Floor Area (ft²)	47852.0	47852.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Jefferson (%)	Jefferson Upgrade (%)
Air System Fans	4.2	4.5
Cooling	6.8	7.3
Heating	46.4	42.2
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**57.3**	**53.9**
Lights	32.8	35.4
Electric Equipment	2.7	2.9
Misc. Electric	1.6	1.7
Misc. Fuel Use	5.6	6.1
Non-HVAC Sub-Total	**42.7**	**46.1**
Grand Total	**100.0**	**100.0**

Table 1. Annual Costs

Component	Jefferson ($)	Jefferson Upgrade ($)
HVAC Components		
Electric	5,090	5,090
Natural Gas	21,634	18,245
Fuel Oil	0	0
Propane	0	0
Remote HW	0	0
Remote Steam	0	0
Remote CW	0	0
HVAC Sub-Total	**26,724**	**23,335**
Non-HVAC Components		
Electric	17,287	17,287
Natural Gas	2,635	2,635
Fuel Oil	0	0
Propane	0	0
Remote HW	0	0
Remote Steam	0	0
Non-HVAC Sub-Total	**19,922**	**19,922**
Grand Total	**46,646**	**43,257**

Table 2. Annual Energy Consumption

Component	Jefferson	Jefferson Upgrade
HVAC Components		
Electric (kWh)	39,152	39,152
Natural Gas (Therm)	24,038	20,273
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Remote CW (na)	0	0
Non-HVAC Components		
Electric (kWh)	132,978	132,978
Natural Gas (Therm)	2,928	2,928
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Totals		
Electric (kWh)	172,130	172,130
Natural Gas (Therm)	26,965	23,200
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Remote CW (na)	0	0

Table 3. Annual Emissions

Component	Jefferson	Jefferson Upgrade
CO2 Equivalent (lb)	0	0

Table 4. Annual Cost per Unit Floor Area

Component	Jefferson ($/ft²)	Jefferson Upgrade ($/ft²)
HVAC Components		
Electric	0.106	0.106
Natural Gas	0.452	0.381
Fuel Oil	0.000	0.000
Propane	0.000	0.000
Remote HW	0.000	0.000
Remote Steam	0.000	0.000
Remote CW	0.000	0.000
HVAC Sub-Total	**0.559**	**0.488**
Non-HVAC Components		
Electric	0.361	0.361
Natural Gas	0.055	0.055
Fuel Oil	0.000	0.000
Propane	0.000	0.000
Remote HW	0.000	0.000
Remote Steam	0.000	0.000
Non-HVAC Sub-Total	**0.416**	**0.416**
Grand Total	**0.975**	**0.904**
Gross Floor Area (ft²)	47852.0	47852.0
Conditioned Floor Area (ft²)	47852.0	47852.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 5. Component Cost as a Percentage of Total Cost

Component	Jefferson (%)	Jefferson Upgrade (%)
HVAC Components		
Electric	10.9	11.8
Natural Gas	46.4	42.2
Fuel Oil	0.0	0.0
Propane	0.0	0.0
Remote HW	0.0	0.0
Remote Steam	0.0	0.0
Remote CW	0.0	0.0
HVAC Sub-Total	**57.3**	**53.9**
Non-HVAC Components		
Electric	37.1	40.0
Natural Gas	5.6	6.1
Fuel Oil	0.0	0.0
Propane	0.0	0.0
Remote HW	0.0	0.0
Remote Steam	0.0	0.0
Non-HVAC Sub-Total	**42.7**	**46.1**
Grand Total	**100.0**	**100.0**

Monthly Energy Use by Energy Type - Jefferson

Jefferson
CDM Smith

10/20/2015
09:16AM

1. HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)	Remote CW (na)
Jan	3,424	6,557	0	0	0	0	0
Feb	3,044	4,423	0	0	0	0	0
Mar	3,357	3,065	0	0	0	0	0
Apr	3,638	1,771	0	0	0	0	0
May	4,042	0	0	0	0	0	0
Jun	4,130	0	0	0	0	0	0
Jul	1,303	0	0	0	0	0	0
Aug	1,214	0	0	0	0	0	0
Sep	4,162	0	0	0	0	0	0
Oct	4,049	921	0	0	0	0	0
Nov	3,264	2,523	0	0	0	0	0
Dec	3,527	4,778	0	0	0	0	0
Totals	39,152	24,038	0	0	0	0	0

2. Non-HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)
Jan	11,639	257	0	0	0	0
Feb	10,192	224	0	0	0	0
Mar	10,811	238	0	0	0	0
Apr	11,157	246	0	0	0	0
May	11,237	247	0	0	0	0
Jun	10,730	236	0	0	0	0
Jul	11,639	257	0	0	0	0
Aug	10,811	238	0	0	0	0
Sep	11,157	246	0	0	0	0
Oct	11,639	257	0	0	0	0
Nov	10,328	227	0	0	0	0
Dec	11,639	257	0	0	0	0
Totals	132,978	2,928	0	0	0	0

Monthly Energy Use by Energy Type - Jefferson Upgrade

Jefferson
CDM Smith

10/20/2015
09:16AM

1. HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)	Remote CW (na)
Jan	3,424	5,530	0	0	0	0	0
Feb	3,044	3,730	0	0	0	0	0
Mar	3,357	2,585	0	0	0	0	0
Apr	3,638	1,494	0	0	0	0	0
May	4,042	0	0	0	0	0	0
Jun	4,130	0	0	0	0	0	0
Jul	1,303	0	0	0	0	0	0
Aug	1,214	0	0	0	0	0	0
Sep	4,162	0	0	0	0	0	0
Oct	4,049	777	0	0	0	0	0
Nov	3,264	2,128	0	0	0	0	0
Dec	3,527	4,030	0	0	0	0	0
Totals	39,152	20,273	0	0	0	0	0

2. Non-HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)
Jan	11,639	257	0	0	0	0
Feb	10,192	224	0	0	0	0
Mar	10,811	238	0	0	0	0
Apr	11,157	246	0	0	0	0
May	11,237	247	0	0	0	0
Jun	10,730	236	0	0	0	0
Jul	11,639	257	0	0	0	0
Aug	10,811	238	0	0	0	0
Sep	11,157	246	0	0	0	0
Oct	11,639	257	0	0	0	0
Nov	10,328	227	0	0	0	0
Dec	11,639	257	0	0	0	0
Totals	132,978	2,928	0	0	0	0

Table 1. Annual Costs

Component	Mckinley ($)	McKinley Upgrade ($)
Air System Fans	1,721	1,721
Cooling	3,863	3,863
Heating	21,813	16,597
Pumps	945	945
Heat Rejection Fans	0	0
HVAC Sub-Total	**28,342**	**23,126**
Lights	14,045	14,045
Electric Equipment	164	164
Misc. Electric	975	975
Misc. Fuel Use	2,635	2,635
Non-HVAC Sub-Total	**17,819**	**17,819**
Grand Total	**46,161**	**40,945**

Table 2. Annual Cost per Unit Floor Area

Component	Mckinley ($/ft²)	McKinley Upgrade ($/ft²)
Air System Fans	0.028	0.028
Cooling	0.063	0.063
Heating	0.357	0.271
Pumps	0.016	0.016
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.464**	**0.378**
Lights	0.230	0.230
Electric Equipment	0.003	0.003
Misc. Electric	0.016	0.016
Misc. Fuel Use	0.043	0.043
Non-HVAC Sub-Total	**0.292**	**0.292**
Grand Total	**0.755**	**0.670**
Gross Floor Area (ft²)	61141.0	61141.0
Conditioned Floor Area (ft²)	61141.0	61141.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Mckinley (%)	McKinley Upgrade (%)
Air System Fans	3.7	4.2
Cooling	8.4	9.4
Heating	47.3	40.5
Pumps	2.0	2.3
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**61.4**	**56.5**
Lights	30.4	34.3
Electric Equipment	0.4	0.4
Misc. Electric	2.1	2.4
Misc. Fuel Use	5.7	6.4
Non-HVAC Sub-Total	**38.6**	**43.5**
Grand Total	**100.0**	**100.0**

Table 1. Annual Costs

Component	Mckinley ($)	McKinley Upgrade ($)
HVAC Components		
Electric	6,529	6,529
Natural Gas	21,813	16,597
Fuel Oil	0	0
Propane	0	0
Remote HW	0	0
Remote Steam	0	0
Remote CW	0	0
HVAC Sub-Total	**28,342**	**23,126**
Non-HVAC Components		
Electric	15,184	15,184
Natural Gas	2,635	2,635
Fuel Oil	0	0
Propane	0	0
Remote HW	0	0
Remote Steam	0	0
Non-HVAC Sub-Total	**17,819**	**17,819**
Grand Total	**46,161**	**40,945**

Table 2. Annual Energy Consumption

Component	Mckinley	McKinley Upgrade
HVAC Components		
Electric (kWh)	54,412	54,412
Natural Gas (Therm)	24,236	18,441
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Remote CW (na)	0	0
Non-HVAC Components		
Electric (kWh)	126,536	126,536
Natural Gas (Therm)	2,928	2,928
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Totals		
Electric (kWh)	180,948	180,948
Natural Gas (Therm)	27,164	21,368
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Remote CW (na)	0	0

Table 3. Annual Emissions

Component	Mckinley	McKinley Upgrade
CO2 Equivalent (lb)	0	0

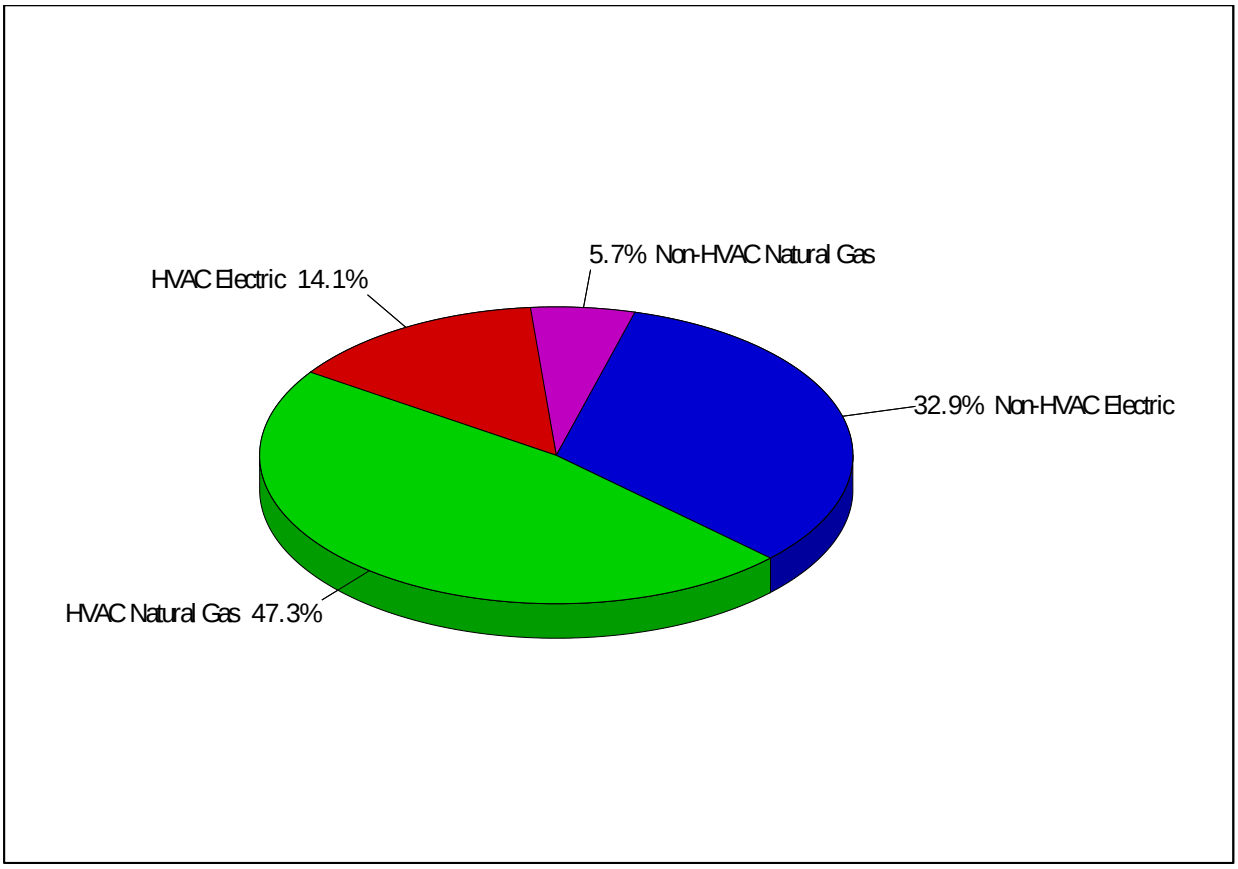
Table 4. Annual Cost per Unit Floor Area

Component	Mckinley ($/ft²)	McKinley Upgrade ($/ft²)
HVAC Components		
Electric	0.107	0.107
Natural Gas	0.357	0.271
Fuel Oil	0.000	0.000
Propane	0.000	0.000
Remote HW	0.000	0.000
Remote Steam	0.000	0.000
Remote CW	0.000	0.000
HVAC Sub-Total	**0.464**	**0.378**
Non-HVAC Components		
Electric	0.248	0.248
Natural Gas	0.043	0.043
Fuel Oil	0.000	0.000
Propane	0.000	0.000
Remote HW	0.000	0.000
Remote Steam	0.000	0.000
Non-HVAC Sub-Total	**0.291**	**0.291**
Grand Total	**0.755**	**0.670**
Gross Floor Area (ft²)	61141.0	61141.0
Conditioned Floor Area (ft²)	61141.0	61141.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 5. Component Cost as a Percentage of Total Cost

Component	Mckinley (%)	McKinley Upgrade (%)
HVAC Components		
Electric	14.1	15.9
Natural Gas	47.3	40.5
Fuel Oil	0.0	0.0
Propane	0.0	0.0
Remote HW	0.0	0.0
Remote Steam	0.0	0.0
Remote CW	0.0	0.0
HVAC Sub-Total	**61.4**	**56.5**
Non-HVAC Components		
Electric	32.9	37.1
Natural Gas	5.7	6.4
Fuel Oil	0.0	0.0
Propane	0.0	0.0
Remote HW	0.0	0.0
Remote Steam	0.0	0.0
Non-HVAC Sub-Total	**38.6**	**43.5**
Grand Total	**100.0**	**100.0**



1. Annual Costs

Component	Annual Cost ($/yr)	($/ft²)	Percent of Total (%)
HVAC Components			
Electric	6,529	0.107	14.1
Natural Gas	21,813	0.357	47.3
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Remote Chilled Water	0	0.000	0.0
HVAC Sub-Total	**28,342**	**0.464**	**61.4**
Non-HVAC Components			
Electric	15,184	0.248	32.9
Natural Gas	2,635	0.043	5.7
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Non-HVAC Sub-Total	**17,819**	**0.291**	**38.6**
Grand Total	**46,161**	**0.755**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **61141.0** ft²
Conditioned Floor Area ..... **61141.0** ft²

Monthly Energy Use by Energy Type - Mckinley

McKinley Upgrade
CDM Smith

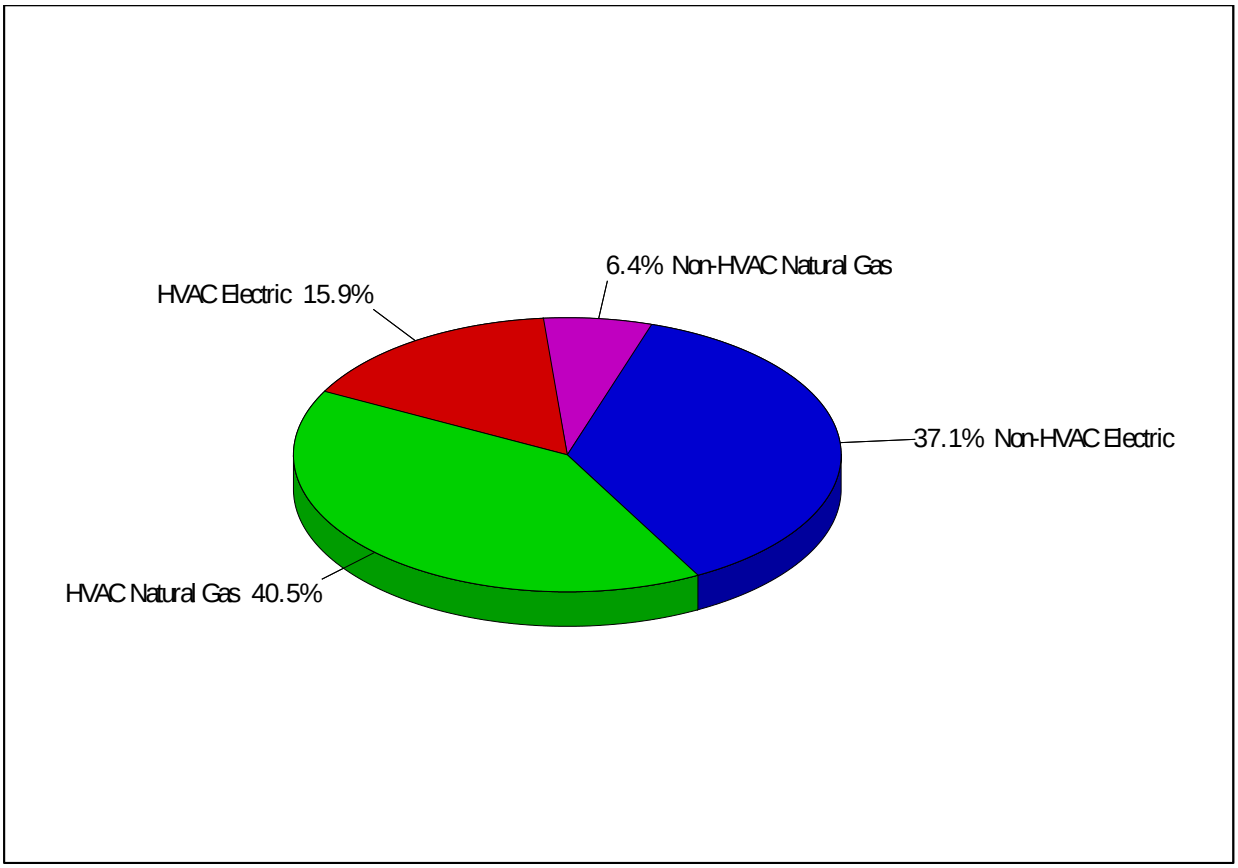
10/20/2015
09:13AM

1. HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)	Remote CW (na)
Jan	6,025	6,522	0	0	0	0	0
Feb	5,214	4,429	0	0	0	0	0
Mar	5,526	3,126	0	0	0	0	0
Apr	5,664	1,880	0	0	0	0	0
May	5,418	0	0	0	0	0	0
Jun	1,150	0	0	0	0	0	0
Jul	1,253	0	0	0	0	0	0
Aug	1,168	0	0	0	0	0	0
Sep	5,624	0	0	0	0	0	0
Oct	6,113	938	0	0	0	0	0
Nov	5,284	2,584	0	0	0	0	0
Dec	5,972	4,758	0	0	0	0	0
Totals	54,412	24,236	0	0	0	0	0

2. Non-HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)
Jan	11,076	257	0	0	0	0
Feb	9,698	224	0	0	0	0
Mar	10,285	238	0	0	0	0
Apr	10,617	246	0	0	0	0
May	10,693	247	0	0	0	0
Jun	10,210	236	0	0	0	0
Jul	11,076	257	0	0	0	0
Aug	10,285	238	0	0	0	0
Sep	10,617	246	0	0	0	0
Oct	11,076	257	0	0	0	0
Nov	9,826	227	0	0	0	0
Dec	11,076	257	0	0	0	0
Totals	126,536	2,928	0	0	0	0



1. Annual Costs

Component	Annual Cost ($/yr)	($/ft²)	Percent of Total (%)
HVAC Components			
Electric	6,529	0.107	15.9
Natural Gas	16,597	0.271	40.5
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Remote Chilled Water	0	0.000	0.0
HVAC Sub-Total	**23,126**	**0.378**	**56.5**
Non-HVAC Components			
Electric	15,184	0.248	37.1
Natural Gas	2,635	0.043	6.4
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Non-HVAC Sub-Total	**17,819**	**0.291**	**43.5**
Grand Total	**40,945**	**0.670**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **61141.0** ft²
Conditioned Floor Area ..... **61141.0** ft²

1. HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)	Remote CW (na)
Jan	6,025	4,963	0	0	0	0	0
Feb	5,214	3,370	0	0	0	0	0
Mar	5,526	2,378	0	0	0	0	0
Apr	5,664	1,431	0	0	0	0	0
May	5,418	0	0	0	0	0	0
Jun	1,150	0	0	0	0	0	0
Jul	1,253	0	0	0	0	0	0
Aug	1,168	0	0	0	0	0	0
Sep	5,624	0	0	0	0	0	0
Oct	6,113	713	0	0	0	0	0
Nov	5,284	1,966	0	0	0	0	0
Dec	5,972	3,620	0	0	0	0	0
Totals	54,412	18,441	0	0	0	0	0

2. Non-HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)
Jan	11,076	257	0	0	0	0
Feb	9,698	224	0	0	0	0
Mar	10,285	238	0	0	0	0
Apr	10,617	246	0	0	0	0
May	10,693	247	0	0	0	0
Jun	10,210	236	0	0	0	0
Jul	11,076	257	0	0	0	0
Aug	10,285	238	0	0	0	0
Sep	10,617	246	0	0	0	0
Oct	11,076	257	0	0	0	0
Nov	9,826	227	0	0	0	0
Dec	11,076	257	0	0	0	0
Totals	126,536	2,928	0	0	0	0

Annual Cost Summary

Roosevelt Upgrade
CDM Smith

10/20/2015
09:14AM

Table 1. Annual Costs

Component	Roosevelt ($)	Roosevelt Upgrade ($)
Air System Fans	6,327	6,327
Cooling	3,589	3,589
Heating	35,376	29,835
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**45,293**	**39,752**
Lights	44,151	44,151
Electric Equipment	7,110	7,110
Misc. Electric	2,076	2,076
Misc. Fuel Use	2,550	2,550
Non-HVAC Sub-Total	**55,887**	**55,887**
Grand Total	**101,180**	**95,639**

Table 2. Annual Cost per Unit Floor Area

Component	Roosevelt ($/ft²)	Roosevelt Upgrade ($/ft²)
Air System Fans	0.056	0.056
Cooling	0.032	0.032
Heating	0.313	0.264
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.401**	**0.352**
Lights	0.391	0.391
Electric Equipment	0.063	0.063
Misc. Electric	0.018	0.018
Misc. Fuel Use	0.023	0.023
Non-HVAC Sub-Total	**0.495**	**0.495**
Grand Total	**0.896**	**0.847**
Gross Floor Area (ft²)	112902.0	112902.0
Conditioned Floor Area (ft²)	112902.0	112902.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Roosevelt (%)	Roosevelt Upgrade (%)
Air System Fans	6.3	6.6
Cooling	3.5	3.8
Heating	35.0	31.2
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**44.8**	**41.6**
Lights	43.6	46.2
Electric Equipment	7.0	7.4
Misc. Electric	2.1	2.2
Misc. Fuel Use	2.5	2.7
Non-HVAC Sub-Total	**55.2**	**58.4**
Grand Total	**100.0**	**100.0**

Table 1. Annual Costs

Component	Roosevelt ($)	Roosevelt Upgrade ($)
HVAC Components		
Electric	9,917	9,917
Natural Gas	35,376	29,835
Fuel Oil	0	0
Propane	0	0
Remote HW	0	0
Remote Steam	0	0
Remote CW	0	0
HVAC Sub-Total	**45,293**	**39,752**
Non-HVAC Components		
Electric	53,337	53,337
Natural Gas	2,550	2,550
Fuel Oil	0	0
Propane	0	0
Remote HW	0	0
Remote Steam	0	0
Non-HVAC Sub-Total	**55,887**	**55,887**
Grand Total	**101,180**	**95,639**

Table 2. Annual Energy Consumption

Component	Roosevelt	Roosevelt Upgrade
HVAC Components		
Electric (kWh)	76,282	76,282
Natural Gas (Therm)	39,307	33,150
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Remote CW (na)	0	0
Non-HVAC Components		
Electric (kWh)	410,288	410,288
Natural Gas (Therm)	2,833	2,833
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Totals		
Electric (kWh)	486,571	486,571
Natural Gas (Therm)	42,140	35,984
Fuel Oil (na)	0	0
Propane (na)	0	0
Remote HW (na)	0	0
Remote Steam (na)	0	0
Remote CW (na)	0	0

Table 3. Annual Emissions

Component	Roosevelt	Roosevelt Upgrade
CO2 Equivalent (lb)	0	0

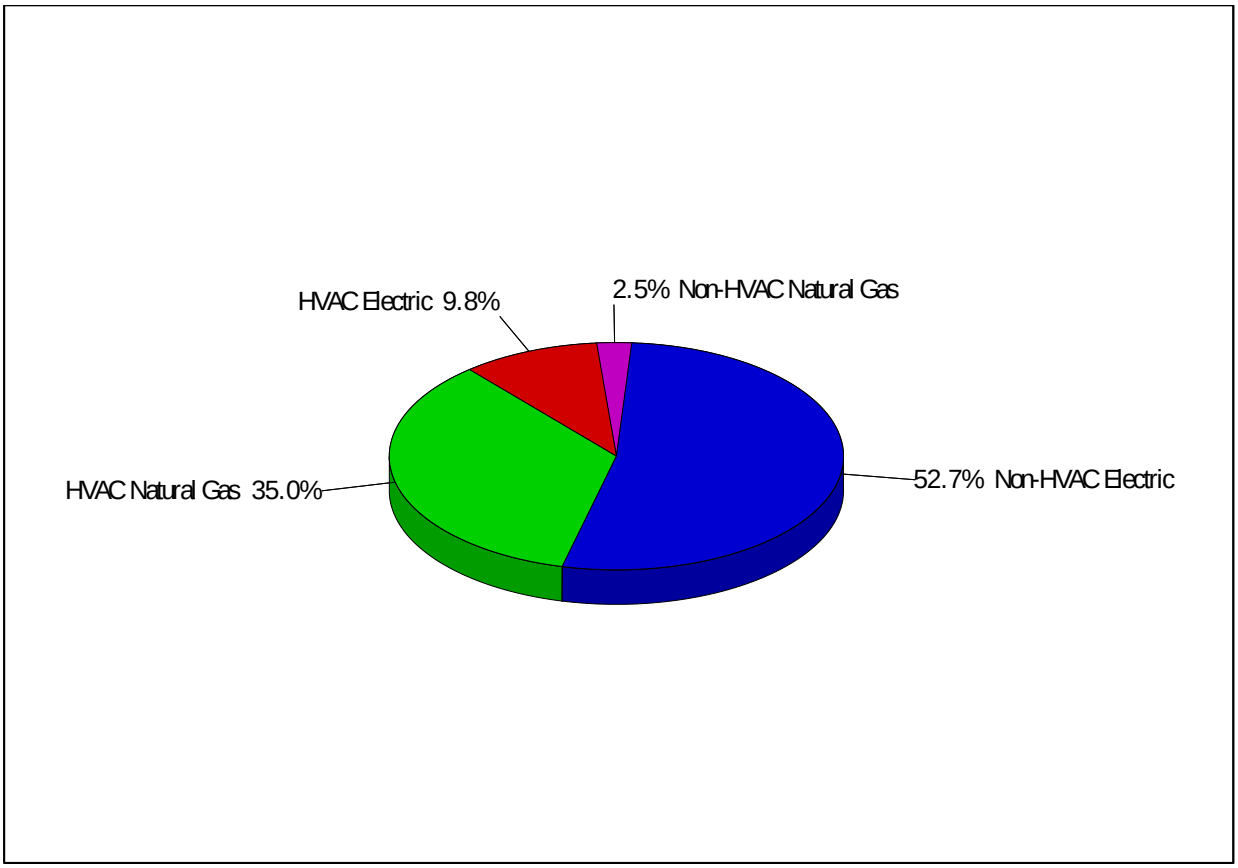
Table 4. Annual Cost per Unit Floor Area

Component	Roosevelt ($/ft²)	Roosevelt Upgrade ($/ft²)
HVAC Components		
Electric	0.088	0.088
Natural Gas	0.313	0.264
Fuel Oil	0.000	0.000
Propane	0.000	0.000
Remote HW	0.000	0.000
Remote Steam	0.000	0.000
Remote CW	0.000	0.000
HVAC Sub-Total	**0.401**	**0.352**
Non-HVAC Components		
Electric	0.472	0.472
Natural Gas	0.023	0.023
Fuel Oil	0.000	0.000
Propane	0.000	0.000
Remote HW	0.000	0.000
Remote Steam	0.000	0.000
Non-HVAC Sub-Total	**0.495**	**0.495**
Grand Total	**0.896**	**0.847**
Gross Floor Area (ft²)	112902.0	112902.0
Conditioned Floor Area (ft²)	112902.0	112902.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 5. Component Cost as a Percentage of Total Cost

Component	Roosevelt (%)	Roosevelt Upgrade (%)
HVAC Components		
Electric	9.8	10.4
Natural Gas	35.0	31.2
Fuel Oil	0.0	0.0
Propane	0.0	0.0
Remote HW	0.0	0.0
Remote Steam	0.0	0.0
Remote CW	0.0	0.0
HVAC Sub-Total	**44.8**	**41.6**
Non-HVAC Components		
Electric	52.7	55.8
Natural Gas	2.5	2.7
Fuel Oil	0.0	0.0
Propane	0.0	0.0
Remote HW	0.0	0.0
Remote Steam	0.0	0.0
Non-HVAC Sub-Total	**55.2**	**58.4**
Grand Total	**100.0**	**100.0**



1. Annual Costs

Component	Annual Cost ($/yr)	($/ft²)	Percent of Total (%)
HVAC Components			
Electric	9,917	0.088	9.8
Natural Gas	35,376	0.313	35.0
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Remote Chilled Water	0	0.000	0.0
HVAC Sub-Total	**45,293**	**0.401**	**44.8**
Non-HVAC Components			
Electric	53,337	0.472	52.7
Natural Gas	2,550	0.023	2.5
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Non-HVAC Sub-Total	**55,887**	**0.495**	**55.2**
Grand Total	**101,180**	**0.896**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **112902.0** ft²
Conditioned Floor Area ..... **112902.0** ft²

Monthly Energy Use by Energy Type - Roosevelt

Roosevelt Upgrade
CDM Smith

10/20/2015
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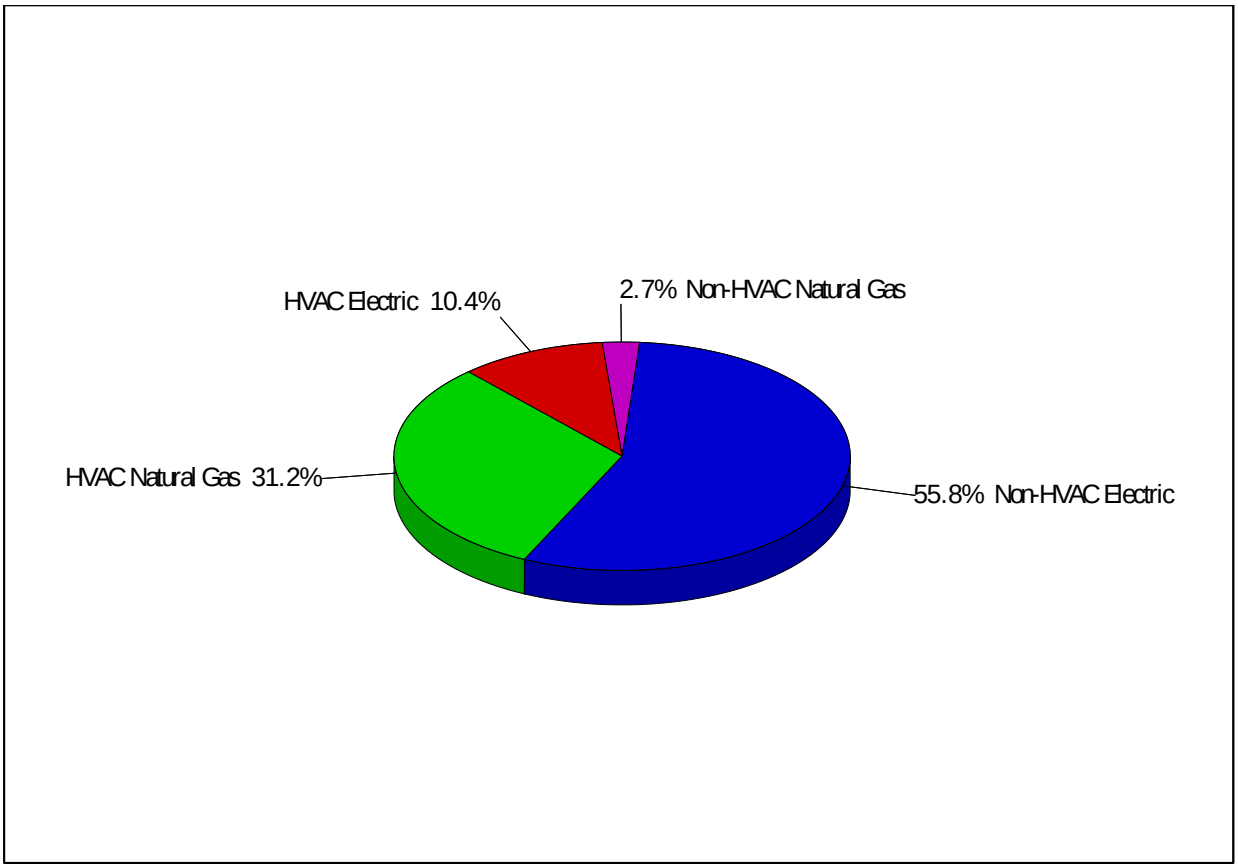
1. HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)	Remote CW (na)
Jan	6,674	10,804	0	0	0	0	0
Feb	5,899	7,142	0	0	0	0	0
Mar	6,408	5,105	0	0	0	0	0
Apr	6,801	2,905	0	0	0	0	0
May	7,298	0	0	0	0	0	0
Jun	7,237	0	0	0	0	0	0
Jul	4,255	0	0	0	0	0	0
Aug	3,964	0	0	0	0	0	0
Sep	7,391	0	0	0	0	0	0
Oct	7,378	1,396	0	0	0	0	0
Nov	6,188	4,150	0	0	0	0	0
Dec	6,789	7,806	0	0	0	0	0
Totals	76,282	39,307	0	0	0	0	0

2. Non-HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)
Jan	35,910	248	0	0	0	0
Feb	31,446	217	0	0	0	0
Mar	33,356	230	0	0	0	0
Apr	34,422	238	0	0	0	0
May	34,671	239	0	0	0	0
Jun	33,107	229	0	0	0	0
Jul	35,910	248	0	0	0	0
Aug	33,356	230	0	0	0	0
Sep	34,422	238	0	0	0	0
Oct	35,910	248	0	0	0	0
Nov	31,869	220	0	0	0	0
Dec	35,910	248	0	0	0	0
Totals	410,288	2,833	0	0	0	0

Annual Energy Costs - Roosevelt Upgrade



1. Annual Costs

Component	Annual Cost ($/yr)	($/ft²)	Percent of Total (%)
HVAC Components			
Electric	9,917	0.088	10.4
Natural Gas	29,835	0.264	31.2
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Remote Chilled Water	0	0.000	0.0
HVAC Sub-Total	**39,752**	**0.352**	**41.6**
Non-HVAC Components			
Electric	53,337	0.472	55.8
Natural Gas	2,550	0.023	2.7
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Non-HVAC Sub-Total	**55,887**	**0.495**	**58.4**
Grand Total	**95,639**	**0.847**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **112902.0** ft²
Conditioned Floor Area ..... **112902.0** ft²

Monthly Energy Use by Energy Type - Roosevelt Upgrade

Roosevelt Upgrade 10/20/2015
CDM Smith 09:14AM

1. HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)	Remote CW (na)
Jan	6,674	9,112	0	0	0	0	0
Feb	5,899	6,023	0	0	0	0	0
Mar	6,408	4,305	0	0	0	0	0
Apr	6,801	2,450	0	0	0	0	0
May	7,298	0	0	0	0	0	0
Jun	7,237	0	0	0	0	0	0
Jul	4,255	0	0	0	0	0	0
Aug	3,964	0	0	0	0	0	0
Sep	7,391	0	0	0	0	0	0
Oct	7,378	1,177	0	0	0	0	0
Nov	6,188	3,500	0	0	0	0	0
Dec	6,789	6,583	0	0	0	0	0
Totals	76,282	33,150	0	0	0	0	0

2. Non-HVAC Energy Use

Month	Electric (kWh)	Natural Gas (Therm)	Fuel Oil (na)	Propane (na)	Remote HW (na)	Remote Steam (na)
Jan	35,910	248	0	0	0	0
Feb	31,446	217	0	0	0	0
Mar	33,356	230	0	0	0	0
Apr	34,422	238	0	0	0	0
May	34,671	239	0	0	0	0
Jun	33,107	229	0	0	0	0
Jul	35,910	248	0	0	0	0
Aug	33,356	230	0	0	0	0
Sep	34,422	238	0	0	0	0
Oct	35,910	248	0	0	0	0
Nov	31,869	220	0	0	0	0
Dec	35,910	248	0	0	0	0
Totals	410,288	2,833	0	0	0	0

Appendix D

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
McKinley Elementary School - Interior	001	105	2F32T8LED	9	65	324	4380	1419.12	$241.3	None Proposed	9	324	4380	4380	1419.12	1419.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	001	106	2F32T8LED	9	55	324	4380	1419.12	$241.3	None Proposed	9	324	4380	4380	1419.12	1419.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	001	Principal	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	23	180	2600	468	$79.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	48.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
McKinley Elementary School - Interior	001	103	2F32T8LED	3	86	108	2600	280.8	$47.7	None Proposed	3	108	2600	1820	280.8	196.56	None Proposed	1	0	84.24	14.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	001	104	2F32T8LED	9		324	2600	842.4	$143.2	None Proposed	9	324	2600	1820	842.4	589.68	None Proposed	1	0	252.72	43.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	001	102	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	26	381	2600	990.6	$168.4	Replace 32W T8 Lamps with 25W T8 Lamps	15	297	2600	1820	772.2	540.54	None Proposed	1	0.084	450.06	76.5	$0.0	$2.5	$4.0	$0.0	$0.0	$4.0	$2.5	$6.5	$60.0	$37.5	$97.5	$0.0	$0
McKinley Elementary School - Interior	001	102 Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	16	60	2600	156	$26.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
McKinley Elementary School - Interior	001	Main Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	46	300	2600	780	$132.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	80.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$75
McKinley Elementary School - Interior	001	Nurse Bath	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	66	61	2600	158.6	$27.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.027	96.72	16.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
McKinley Elementary School - Interior	001	Office Closet	3PL13	1		42	2600	109.2	$18.6	To be Replaced	1	0	2600	1820	0	0	None Proposed	1	0.042	109.2	18.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	001	101	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	36	480	2600	1248	$212.2	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	133.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
McKinley Elementary School - Interior	001	101 Closet	PL4 CFL Fixtures	1	11	26	2600	67.6	$11.5	None Proposed.	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	001	Hall	1X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	13	720	2080	1497.6	$254.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	6	408	2080	2080	848.64	848.64	None Proposed	0	0.312	648.96	110.3	$24.0	$400.0	$65.0	$0.0	$0.0	$65.0	$424.0	$489.0	$390.0	$2,544.0	$2,934.0	$62.4	$120
McKinley Elementary School - Interior	001	Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	22	480	500	240	$40.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	500	350	136	95.2	None Proposed	1	0.208	144.8	24.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
McKinley Elementary School - Interior	001	Hall	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	5	22	450	1560	702	$119.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	5	255	1560	1560	397.8	397.8	None Proposed	0	0.195	304.2	51.7	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$325.0	$870.0	$1,195.0	$39.0	$75
McKinley Elementary School - Interior	001	107	65W Incandescent Fixture	10	10	650	1560	1014	$172.4	Replace 65W Incandescent Fixture with 13W CFL	10	130	1560	1560	202.8	202.8	None Proposed	0	0.52	811.2	137.9	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$40.0	$62.5	$102.5	$213.3	$0
McKinley Elementary School - Interior	001	Girls	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	15	720	500	360	$61.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	36.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
McKinley Elementary School - Interior	001	Boys	65W Incandescent Fixture	1	10	65	500	32.5	$5.5	Replace 65W Incandescent Fixture with 13W CFL	1	13	500	350	6.5	4.55	None Proposed	1	0.052	27.95	4.8	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
McKinley Elementary School - Interior	001	Faculty	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	50	180	500	90	$15.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	2	102	500	350	51	35.7	None Proposed	1	0.078	54.3	9.2	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$130.0	$348.0	$478.0	$15.6	$30
McKinley Elementary School - Interior	001	Janitor	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	58	120	2080	249.6	$42.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2080	1456	141.44	99.008	None Proposed	1	0.052	150.592	25.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
McKinley Elementary School - Interior	001	108	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	53	720	2080	1497.6	$254.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2080	1456	848.64	594.048	None Proposed	1	0.312	903.552	153.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
McKinley Elementary School - Interior	002	Stair	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4		240	2080	499.2	$84.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2080	1456	282.88	198.016	None Proposed	1	0.104	301.184	51.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
McKinley Elementary School - Interior	002	208	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	55	720	2080	1497.6	$254.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2080	1456	848.64	594.048	None Proposed	1	0.312	903.552	153.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
McKinley Elementary School - Interior	002	Boys	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	36	180	2080	374.4	$63.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2080	1456	212.16	148.512	None Proposed	1	0.078	225.888	38.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
McKinley Elementary School - Interior	002	Jan	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	38	120	2080	249.6	$42.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2080	1456	141.44	99.008	None Proposed	1	0.052	150.592	25.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
McKinley Elementary School - Interior	002	Faculty	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	28	60	3120	187.2	$31.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3120	2184	106.08	74.256	None Proposed	1	0.026	112.944	19.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
McKinley Elementary School - Interior	002	Girls	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	32	180	3120	561.6	$95.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3120	2184	318.24	222.768	None Proposed	1	0.078	338.832	57.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
McKinley Elementary School - Interior	002	207	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	44	720	3120	2246.4	$381.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	3120	2184	1272.96	891.072	None Proposed	1	0.312	1355.328	230.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
McKinley Elementary School - Interior	002	206	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	36	720	3120	2246.4	$381.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	3120	2184	1272.96	891.072	None Proposed	1	0.312	1355.328	230.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
McKinley Elementary School - Interior	002	206 Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	43	120	3640	436.8	$74.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3640	3640	247.52	247.52	None Proposed	0	0.052	189.28	32.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
McKinley Elementary School - Interior	002	204	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	41	720	3640	2620.8	$445.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	3640	3640	1485.12	1485.12	None Proposed	0	0.312	1135.68	193.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
McKinley Elementary School - Interior	002	205	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	8760	6307.2	$1,072.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.312	2733.12	464.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
McKinley Elementary School - Interior	002	203	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	8760	6307.2	$1,072.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.312	2733.12	464.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
McKinley Elementary School - Interior	002	Reading	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	8760	525.6	$89.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.026	227.76	38.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
McKinley Elementary School - Interior	002	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	25	300	8760	2628	$446.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	8760	8760	1489.2	1489.2	None Proposed	0	0.13	1138.8	193.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$75
McKinley Elementary School - Interior	002	Teachers	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	19	240	8760	2102.4	$357.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.104	911.04	154.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
McKinley Elementary School - Interior	002	202	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	25	900	8760	7884	$1,340.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	8760	8760	4467.6	4467.6	None Proposed	0	0.39	3416.4	580.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
McKinley Elementary School - Interior	002	202 Closet	PL4 CFL Fixture	1		26	8760	227.76	$38.7	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	1	16	8760	8760	140.16	140.16	None Proposed	0	0.01	87.6	14.9	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$10.0	$130.0	$140.0	$6.0	$0
McKinley Elementary School - Interior	002	201	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	39	900	1560	1404	$238.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	1560	1560	795.6	795.6	None Proposed	0	0.39	608.4	103.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
McKinley Elementary School - Interior	002	201 Closet	PL4 CFL Fixtures	1		26	1560	40.56	$6.9	None Proposed.	1	26	1560	1560	40.56	40.56	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	003	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	10	480	1560	748.8	$127.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	1560	1560	424.32	424.32	None Proposed	0	0.208	324.48	55.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
McKinley Elementary School - Interior	000	Library	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	30	20	3600	3640	13104	$2,227.7	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	30	2040	3640	2548	7425.6	5197.92	None Proposed	1	1.56	7906.08	1,344.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$1,950.0	$6,720.0	$8,670.0	$312.0	$600
McKinley Elementary School - Interior	000		1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4		240	3120	748.8	$127.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	3120	2184	424.32	297.024	None Proposed	1	0.104	451.776	76.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
McKinley Elementary School - Interior	000	Reading	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	100	60	3120	187.2	$31.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3120	2184	106.08	74.256	None Proposed	1	0.026	112.944	19.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
McKinley Elementary School - Interior	000	Hall Elevator	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	52	120	3120	374.4	$63.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.052	225.888	38.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
McKinley Elementary School - Interior	B	Boys	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	3120	374.4	$63.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.052	225.888	38.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
McKinley Elementary School - Interior	B	Girls	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	3120	374.4	$63.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.052	225.888	38.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
McKinley Elementary School - Interior	B	B4	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	60	1080	3120	3369.6	$572.8	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	345.6	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
McKinley Elementary School - Interior	B	B4 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50	60	3120	187.2	$31.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3120	2184	106.08	74.256	None Proposed	1	0.026	112.944	19.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
McKinley Elementary School - Interior	B	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	54	300	3120	936	$159.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	3120	2184	530.4	371.28	None Proposed	1	0.13	564.72	96.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
McKinley Elementary School - Interior	B	Sprinkler	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	3120	187.2	$31.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3120	2184	106.08	74.256	None Proposed	1	0.026	112.944	19.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
McKinley Elementary School - Interior	B	B3	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	70	1080	8760	9460.8	$1,608.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	696.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
McKinley Elementary School - Interior	B	B3 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	30	60	500	30	$5.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
McKinley Elementary School - Interior	B	B3 Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	40	60	500	30	$5.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
McKinley Elementary School - Interior	B	Jan Supply	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	12	32	3640	116.48	$19.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	1	17	3640	2548	61.88	43.316	None Proposed	1	0.015	73.164	12.4	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$65.0	$74.0	$139.0	$2.6	$5

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
McKinley Elementary School - Interior	B	Boys	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	24	180	3640	655.2	$111.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3640	2548	371.28	259.896	None Proposed	1	0.078	395.304	67.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
McKinley Elementary School - Interior	B	B2	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	11	36	1320	3640	4804.8	$816.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	11	748	3640	2548	2722.72	1905.904	None Proposed	1	0.572	2898.896	492.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$715.0	$2,464.0	$3,179.0	$114.4	$220
McKinley Elementary School - Interior	B	Boiler	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	3	13	96	2600	249.6	$42.4	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	3	51	2600	1820	132.6	92.82	None Proposed	1	0.045	156.78	26.7	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$195.0	$222.0	$417.0	$7.8	$15
McKinley Elementary School - Interior	B	Boiler	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3		180	2600	468	$79.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	48.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
McKinley Elementary School - Interior	B	Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	2	120	2600	312	$53.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	32.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
McKinley Elementary School - Interior	B	Office	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1		25.4	2600	66.04	$11.2	Replace 32W T8 Lamps with 25W T8 Lamps	1	19.8	2600	1820	51.48	36.036	None Proposed	1	0.0056	30.004	5.1	$0.0	$2.5	$4.0	$0.0	$0.0	$4.0	$2.5	$6.5	$4.0	$2.5	$6.5	$0.0	$0
McKinley Elementary School - Interior	B	Jan Supply	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	3		76.2	3120	237.744	$40.4	Replace 32W T8 Lamps with 25W T8 Lamps	3	59.4	3120	2184	185.328	129.7296	None Proposed	1	0.0168	108.0144	18.4	$0.0	$2.5	$4.0	$0.0	$0.0	$4.0	$2.5	$6.5	$12.0	$7.5	$19.5	$0.0	$0
McKinley Elementary School - Interior	B	Girls	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	17	180	3120	561.6	$95.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3120	2184	318.24	222.768	None Proposed	1	0.078	338.832	57.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
McKinley Elementary School - Interior	B	Boys	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	56	480	8760	4204.8	$714.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	4	272	8760	8760	2382.72	2382.72	None Proposed	0	0.208	1822.08	309.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
McKinley Elementary School - Interior	B	Pump Room	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	40	85.6	8760	749.856	$127.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.0516	452.016	76.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$0
McKinley Elementary School - Interior	B	Elec	65W Incandescent Fixture	7	13	455	500	227.5	$38.7	Replace 65W Incandescent Fixture with 13W CFL	7	91	500	350	45.5	31.85	None Proposed	1	0.364	195.65	33.3	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$28.0	$43.8	$71.8	$149.3	$0
McKinley Elementary School - Interior	001	Stair	65W Incandescent Fixture	1	12	65	500	32.5	$5.5	Replace 65W Incandescent Fixture with 13W CFL	1	13	500	500	6.5	6.5	None Proposed	0	0.052	26	4.4	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
McKinley Elementary School - Interior	001	Stair	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	30	60	500	30	$5.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
McKinley Elementary School - Interior	B	Hall	2' T5 Fixture w/2 T5FO14 Lamp	4	31	120	500	60	$10.2	None Proposed.	4	120	500	350	60	42	None Proposed	1	0	18	3.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	002	Boys	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	19	50.7	2600	131.82	$22.4	Replace 32W T8 Lamps with 25W T8 Lamps	1	39.7	2600	1820	103.22	72.254	None Proposed	1	0.011	59.566	10.1	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$8.0	$5.0	$13.0	$0.0	$0
McKinley Elementary School - Interior	002	Girls	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	20	60	2600	156	$26.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
McKinley Elementary School - Interior	001	Lobby	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	4	48	684.8	2600	1780.48	$302.7	Replace T12 Bulbs With 32W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	4	448	2600	1820	1164.8	815.36	None Proposed	1	0.2368	965.12	164.1	$105.0	$20.0	$65.0	$0.0	$0.0	$65.0	$125.0	$190.0	$260.0	$500.0	$760.0	$38.1	$0
McKinley Elementary School - Interior	001	Coat/Kitchen	26W CFL Fixture	2		52	2600	135.2	$23.0	None Proposed	2	52	2600	1820	135.2	94.64	None Proposed	1	0	40.56	6.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
McKinley Elementary School - Interior	001	Gym	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	42	1344	2600	3494.4	$594.0	Replace 32W T8 Lamps with 25W T8 Lamps	12	950.4	2600	1820	2471.04	1729.728	None Proposed	1	0.3936	1764.672	300.0	$0.0	$10.0	$16.0	$0.0	$0.0	$16.0	$10.0	$26.0	$192.0	$120.0	$312.0	$0.0	$0
McKinley Elementary School - Interior	B	Stage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	37	507	2600	1318.2	$224.1	Replace 32W T8 Lamps with 25W T8 Lamps	10	397	2600	1820	1032.2	722.54	None Proposed	1	0.11	595.66	101.3	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$80.0	$50.0	$130.0	$0.0	$0
McKinley Elementary School - Interior	001	Stage Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3		152.1	2600	395.46	$67.2	Replace 32W T8 Lamps with 25W T8 Lamps	3	119.1	2600	1820	309.66	216.762	None Proposed	1	0.033	178.698	30.4	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$24.0	$15.0	$39.0	$0.0	$0
McKinley Elementary School - Interior	B	Projector	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	8	202.8	2600	527.28	$89.6	Replace 32W T8 Lamps with 25W T8 Lamps	4	158.8	2600	1820	412.88	289.016	None Proposed	1	0.044	238.264	40.5	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$32.0	$20.0	$52.0	$0.0	$0
Westfield High School - Interior	B	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	20	180	2600	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	50.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Westfield High School - Interior	B	Band Hall	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	33	540	2600	1404	$252.7	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	6	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	152.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$390.0	$1,044.0	$1,434.0	$46.8	$90
Westfield High School - Interior	B	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	13		780	2600	2028	$365.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	13	442	2600	1820	1149.2	804.44	None Proposed	1	0.338	1223.56	220.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$845.0	$1,612.0	$2,457.0	$67.6	$195
Westfield High School - Interior	B	Boiler Room	3PL13	1		42	2600	109.2	$19.7	To be Replaced	1	0	2600	1820	0	0	None Proposed	1	0.042	109.2	19.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	B	Boiler Room Under	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	30	245	2600	637	$114.7	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	7	140	2600	1820	364	254.8	None Proposed	1	0.105	382.2	68.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$70
Westfield High School - Interior	B	Boiler Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	17	1200	2600	3120	$561.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	2600	1820	1768	1237.6	None Proposed	1	0.52	1882.4	338.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$300
Westfield High School - Interior	B	Boiler Hall	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	17	35	2600	91	$16.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	B	9 Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9		540	2600	1404	$252.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	152.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$135
Westfield High School - Interior	B	9 Storage	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		35	2600	91	$16.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	B	9 Bath	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		35	2600	91	$16.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	B	Head Custodian	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	17	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	B	Custodian Bath	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	17	35	2600	91	$16.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	B	Engineer	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	40	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	B	Engineer Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	15	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Westfield High School - Interior	B	Engineer Bath	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	22	35	2600	91	$16.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	B	Bath Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	12	180	2600	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	50.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Westfield High School - Interior	B	Band Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	25	360	500	180	$32.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	500	350	102	71.4	None Proposed	1	0.156	108.6	19.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Westfield High School - Interior	B	Music Comp Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	13	120	3120	374.4	$67.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.052	225.888	40.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	B	Band Room B	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	30	120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	B	Band Hall 2	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3		180	500	90	$16.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	500	350	51	35.7	None Proposed	1	0.078	54.3	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Westfield High School - Interior	B	Band Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	14	120	8760	1051.2	$189.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	8760	8760	595.68	595.68	None Proposed	0	0.052	455.52	82.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	B	Band Bath	150W Incandescent Fixture	1	18	150	8760	1314	$236.5	Replace 150W Incandescent Fixture with 25W CFL	1	25	8760	8760	219	219	None Proposed	0	0.125	1095	197.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Westfield High School - Interior	B	Stair	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	8760	1051.2	$189.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	8760	8760	595.68	595.68	None Proposed	0	0.052	455.52	82.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	B	Stair	150W Incandescent Fixture	2		300	8760	2628	$473.0	Replace 150W Incandescent Fixture with 25W CFL	2	50	8760	8760	438	438	None Proposed	0	0.25	2190	394.2	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$8.0	$14.0	$22.0	$67.2	$0
Westfield High School - Interior	001	Stage Shop	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	26	210	8760	1839.6	$331.1	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	6	120	8760	8760	1051.2	1051.2	None Proposed	0	0.09	788.4	141.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Westfield High School - Interior	001	Auditorium	100W Incandescent Fixture	54		5400	8760	47304	$8,514.7	Replace 100W Incandescent Fixture with 25W CFL	54	1350	8760	8760	11826	11826	None Proposed	0	4.05	35478	6,386.0	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$216.0	$378.0	$594.0	$1,814.4	$0
Westfield High School - Interior	001	Drama Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	10	120	8760	1051.2	$189.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	8760	8760	595.68	595.68	None Proposed	0	0.052	455.52	82.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	001	121 Music	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	31	1800	8760	15768	$2,838.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	30	1020	8760	8760	8935.2	8935.2	None Proposed	0	0.78	6832.8	1,229.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,950.0	$3,720.0	$5,670.0	$156.0	$450
Westfield High School - Interior	001	121 Closet	100W Incandescent Fixture	1	16	100	3120	312	$56.2	Replace 100W Incandescent Fixture with 25W CFL	1	25	3120	3120	78	78	None Proposed	0	0.075	234	42.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Westfield High School - Interior	001	121 Closet	3PL13	1	21	42	3120	131.04	$23.6	To be Replaced	1	0	3120	3120	0	0	None Proposed	0	0.042	131.04	23.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	121 Vest	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	21	35	3120	109.2	$19.7	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	3120	3120	62.4	62.4	None Proposed	0	0.015	46.8	8.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	001	Boys	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	50	420	500	210	$37.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	500	350	119	83.3	None Proposed	1	0.182	126.7	22.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$105
Westfield High School - Interior	001	120	1X4 Suspended Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	46	1440	500	720	$129.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	350	408	285.6	None Proposed	1	0.624	434.4	78.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Westfield High School - Interior	001	120C	26W CFL Fixture	1	6	26	500	13	$2.3	None Proposed	1	26	500	350	13	9.1	None Proposed	1	0	3.9	0.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Hall (120s)	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	19	35	1710	1560	2667.6	$480.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	19	969	1560	1560	1511.64	1511.64	None Proposed	0	0.741	1155.96	208.1	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,235.0	$3,306.0	$4,541.0	$148.2	$285
Westfield High School - Interior	001	Janitors Closet	75W Incandescent Fixture	1		75	500	37.5	$6.8	Replace 75W Incandescent Fixture with 13W CFL	1	13	500	350	6.5	4.55	None Proposed	1	0.062	32.95	5.9	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
Westfield High School - Interior	001	Hall (110s)	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	19	28	1710	2600	4446	$800.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	19	969	2600	1820	2519.4	1763.58	None Proposed	1	0.741	2682.42	482.8	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,235.0	$3,306.0	$4,541.0	$148.2	$285
Westfield High School - Interior	001	110	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	33	960	2600	2496	$449.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	2600	1820	1414.4	990.08	None Proposed	1	0.416	1505.92	271.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$240
Westfield High School - Interior	001	110 Closet	75W Incandescent Fixture	1		75	2600	195	$35.1	Replace 75W Incandescent Fixture with 13W CFL	1	13	2600	1820	33.8	23.66	None Proposed	1	0.062	171.34	30.8	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
Westfield High School - Interior	001	112	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	26	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Westfield High School - Interior	001	115	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	47	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Westfield High School - Interior	001	117	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Westfield High School - Interior	001	Lobby	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4		360	2600	936	$168.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	4	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$260.0	$696.0	$956.0	$31.2	$60
Westfield High School - Interior	001	Entry	75W Incandescent Fixture	5		375	2600	975	$175.5	Replace 75W Incandescent Fixture with 13W CFL	5	65	2600	1820	169	118.3	None Proposed	1	0.31	856.7	154.2	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$20.0	$31.3	$51.3	$106.7	$0
Westfield High School - Interior	001	119	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	26	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Westfield High School - Interior	001	Girls	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	14	720	2600	1872	$337.0	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	8	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$520.0	$1,392.0	$1,912.0	$62.4	$120
Westfield High School - Interior	001	Janitors Closet	100W Incandescent Fixture	1	9	100	2600	260	$46.8	Replace 100W Incandescent Fixture with 25W CFL	1	25	2600	1820	65	45.5	None Proposed	1	0.075	214.5	38.6	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Westfield High School - Interior	001	Attendance	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	19	51	1710	2600	4446	$800.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	19	969	2600	1820	2519.4	1763.58	None Proposed	1	0.741	2682.42	482.8	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,235.0	$3,306.0	$4,541.0	$148.2	$285
Westfield High School - Interior	001	Main Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	60	960	2600	2496	$449.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	2600	1820	1414.4	990.08	None Proposed	1	0.416	1505.92	271.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$160
Westfield High School - Interior	001	Copy Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	36	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Westfield High School - Interior	001	Mail Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	39	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Westfield High School - Interior	001	Athletic Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	44	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Westfield High School - Interior	001	110	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8		480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Westfield High School - Interior	001	Stair	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4		240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Westfield High School - Interior	001	Room D	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3		270	2600	702	$126.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	3	153	2600	1820	397.8	278.46	None Proposed	1	0.117	423.54	76.2	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$195.0	$522.0	$717.0	$23.4	$45
Westfield High School - Interior	001	Auditorium Lobby	2PL13	97	18	3104	2600	8070.4	$1,452.7	To be Replaced	97	0	2600	1820	0	0	None Proposed	1	3.104	8070.4	1,452.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Auditorium Lobby	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	22		2640	2600	6864	$1,235.5	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	22	1496	2600	1820	3889.6	2722.72	None Proposed	1	1.144	4141.28	745.4	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$1,430.0	$4,928.0	$6,358.0	$228.8	$440
Westfield High School - Interior	001	Gym Mens	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	60	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Westfield High School - Interior	001	Gym Mens	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	60	35	2600	91	$16.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	001	Gym Mens	1X2 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	60	65	2600	169	$30.4	Remove Ballast, Install 4-10W LED Tube Retrofit Bulbs	1	40	2600	1820	104	72.8	None Proposed	1	0.025	96.2	17.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Westfield High School - Interior	001	Gym Womens	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	25	70	2600	182	$32.8	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	2600	1820	104	72.8	None Proposed	1	0.03	109.2	19.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Westfield High School - Interior	001	Gym Womens	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Westfield High School - Interior	001	Gym Lobby	2PL13	28	20	896	2600	2329.6	$419.3	To be Replaced	28	0	2600	1820	0	0	None Proposed	1	0.896	2329.6	419.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Gym	2x4 Fixture w/ 4 T-5 Lamps w/ Electronic Ballasts	42	50	0	500	0	$0.0	0	42	0	500	350	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Gym Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	20	120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	001	Gym Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	38	120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	001	Bath	2PL13	1		32	8760	280.32	$50.5	To be Replaced	1	0	8760	8760	0	0	None Proposed	0	0.032	280.32	50.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Boys Locker	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	26	960	8760	8409.6	$1,513.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	8760	8760	4765.44	4765.44	None Proposed	0	0.416	3644.16	655.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$240
Westfield High School - Interior	001	Boys Locker	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	12	70	8760	613.2	$110.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	8760	8760	350.4	350.4	None Proposed	0	0.03	262.8	47.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Westfield High School - Interior	001	Boys Locker	1X2 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4		260	8760	2277.6	$410.0	Remove Ballast, Install 4-10W LED Tube Retrofit Bulbs	4	160	8760	8760	1401.6	1401.6	None Proposed	0	0.1	876	157.7	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
Westfield High School - Interior	001	Janitors	3PL13	1	5	42	500	21	$3.8	To be Replaced	1	0	500	500	0	0	None Proposed	0	0.042	21	3.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Gym Vestibule	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		61	8760	534.36	$96.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.027	236.52	42.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	001	Back Gym	1x4 Fixture w/ 4 T-5 Lamps w/ Electronic Ballasts	13		0	8760	0	$0.0	0	13	0	8760	8760	0	0	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Gym Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4		240	8760	2102.4	$378.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.104	911.04	164.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Westfield High School - Interior	001	Phys Ed Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	16	480	500	240	$43.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	500	350	136	95.2	None Proposed	1	0.208	144.8	26.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Westfield High School - Interior	001	Gym Vestibule	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	24	210	500	105	$18.9	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	6	120	500	350	60	42	None Proposed	1	0.09	63	11.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Westfield High School - Interior	001	Weight Room	1x4 Fixture w/ 4 T-5 Lamps w/ Electronic Ballasts	10	27	0	500	0	$0.0	0	10	0	500	350	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Weight Room Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	5	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Westfield High School - Interior	001	Gym Hall	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	21	720	2600	1872	$337.0	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	8	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$520.0	$1,392.0	$1,912.0	$62.4	$120
Westfield High School - Interior	001	Gym Stair	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	19	17	1710	2600	4446	$800.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	19	969	2600	1820	2519.4	1763.58	None Proposed	1	0.741	2682.42	482.8	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,235.0	$3,306.0	$4,541.0	$148.2	$285
Westfield High School - Interior	001	180	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	100	900	2600	2340	$421.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	2600	1820	1326	928.2	None Proposed	1	0.39	1411.8	254.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
Westfield High School - Interior	001	182	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	78	900	2600	2340	$421.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	2600	1820	1326	928.2	None Proposed	1	0.39	1411.8	254.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
Westfield High School - Interior	001	Addition Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	14	540	2600	1404	$252.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	152.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$135
Westfield High School - Interior	001	Gym 5	2x4 Fixture w/ 4 T-5 Lamps w/ Electronic Ballasts	21		0	2600	0	$0.0	0	21	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Closet	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		70	2600	182	$32.8	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	2600	1820	104	72.8	None Proposed	1	0.03	109.2	19.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Westfield High School - Interior	001	140	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	48	900	2600	2340	$421.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	2600	1820	1326	928.2	None Proposed	1	0.39	1411.8	254.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
Westfield High School - Interior	001	140 Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	28	900	2600	2340	$421.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	2600	1820	1326	928.2	None Proposed	1	0.39	1411.8	254.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
Westfield High School - Interior	001	140 Closet	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	21	35	2600	91	$16.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Westfield High School - Interior	001	Women's Locker	70W Incandescent Fixture	4		280	2600	728	$131.0	Replace 70W Incandescent Fixture with	4	0	2600	1820	0	0	None Proposed	1	0.28	728	131.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Women's Locker	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	40	4	1400	2600	3640	$655.2	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	40	800	2600	1820	2080	1456	None Proposed	1	0.6	2184	393.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,600.0	$4,960.0	$7,560.0	$208.0	$400
Westfield High School - Interior	001	Women's Locker	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	7	140	2600	364	$65.5	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	4	80	2600	1820	208	145.6	None Proposed	1	0.06	218.4	39.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Westfield High School - Interior	001	Locker Office	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	49	210	2600	546	$98.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	6	120	2600	1820	312	218.4	None Proposed	1	0.09	327.6	59.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Westfield High School - Interior	001	Locker Office	75W Incandescent Fixture	1		75	2600	195	$35.1	Replace 75W Incandescent Fixture with 13W CFL	1	13	2600	1820	33.8	23.66	None Proposed	1	0.062	171.34	30.8	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
Westfield High School - Interior	001	140 Storage	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		35	2600	91	$16.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	001	Health Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	76	1080	2600	2808	$505.4	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Westfield High School - Interior	001	Health Office	26W CFL Fixture	1	76	26	500	13	$2.3	None Proposed	1	26	500	350	13	9.1	None Proposed	1	0	3.9	0.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	130 Janitors	26W CFL Fixture	1	8	26	8760	227.76	$41.0	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	130 Hall	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	21		1890	8760	16556.4	$2,980.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	21	1071	8760	8760	9381.96	9381.96	None Proposed	0	0.819	7174.44	1,291.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,365.0	$3,654.0	$5,019.0	$163.8	$315
Westfield High School - Interior	001	139	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	44	840	500	420	$75.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	500	350	238	166.6	None Proposed	1	0.364	253.4	45.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$140
Westfield High School - Interior	001	142	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	16	27	1440	3120	4492.8	$808.7	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	16	816	3120	3120	2545.92	2545.92	None Proposed	0	0.624	1946.88	350.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,040.0	$2,784.0	$3,824.0	$124.8	$240
Westfield High School - Interior	001	141	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	32	48	1920	500	960	$172.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	32	1088	500	350	544	380.8	None Proposed	1	0.832	579.2	104.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,080.0	$3,968.0	$6,048.0	$166.4	$480
Westfield High School - Interior	001	143	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	32	56	1920	500	960	$172.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	32	1088	500	500	544	544	None Proposed	0	0.832	416	74.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,080.0	$3,968.0	$6,048.0	$166.4	$480
Westfield High School - Interior	001	145	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	32	52	1920	500	960	$172.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	32	1088	500	500	544	544	None Proposed	0	0.832	416	74.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,080.0	$3,968.0	$6,048.0	$166.4	$480
Westfield High School - Interior	001	147	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	28	51	1680	500	840	$151.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	28	952	500	500	476	476	None Proposed	0	0.728	364	65.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,820.0	$3,472.0	$5,292.0	$145.6	$420
Westfield High School - Interior	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	18	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	001	Storage	26W CFL Fixture	3	18	78	2600	202.8	$36.5	None Proposed	3	78	2600	1820	202.8	141.96	None Proposed	1	0	60.84	11.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Courtyard	26W CFL Fixture	3		78	2600	202.8	$36.5	None Proposed	3	78	2600	1820	202.8	141.96	None Proposed	1	0	60.84	11.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Counseling	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	38	24	2280	2600	5928	$1,067.0	Remove Ballast, Instal 2-17W LED Tube Retrofit Bulbs	38	1292	2600	1820	3359.2	2351.44	None Proposed	1	0.988	3576.56	643.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,470.0	$4,712.0	$7,182.0	$197.6	$380
Westfield High School - Interior	001	138	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	26	61	500	30.5	$5.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.027	18.6	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	001	138	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	26	360	500	180	$32.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	500	350	102	71.4	None Proposed	1	0.156	108.6	19.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Westfield High School - Interior	001	136	2X2 Fixtures w/ 4-17W T8 Lamps w/ Electronic Ballasts	3	29	189	2600	491.4	$88.5	Remove Ballast, Install 4-10W LED Tube Retrofit Bulbs	3	120	2600	1820	312	218.4	None Proposed	1	0.069	273	49.1	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$195.0	$672.0	$867.0	$31.2	$60
Westfield High School - Interior	001	132	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	47	1080	2600	2808	$505.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Westfield High School - Interior	001	130	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9		810	2600	2106	$379.1	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	9	459	2600	1820	1193.4	835.38	None Proposed	1	0.351	1270.62	228.7	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$585.0	$1,566.0	$2,151.0	$70.2	$135
Westfield High School - Interior	001	131	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	48	960	2600	2496	$449.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	2600	1820	1414.4	990.08	None Proposed	1	0.416	1505.92	271.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$240
Westfield High School - Interior	001	135	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	22	61	1320	2600	3432	$617.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	22	748	2600	1820	1944.8	1361.36	None Proposed	1	0.572	2070.64	372.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,430.0	$2,728.0	$4,158.0	$114.4	$330
Westfield High School - Interior	001	137	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	41	52	2460	2600	6396	$1,151.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	41	1394	2600	1820	3624.4	2537.08	None Proposed	1	1.066	3858.92	694.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,665.0	$5,084.0	$7,749.0	$213.2	$615
Westfield High School - Interior	001	Elevator	26W CFL Fixture	1		26	2600	67.6	$12.2	None Proposed	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	Elevator	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	001	123	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	41	352	2600	915.2	$164.7	Replace 32W T8 Lamps with 25W T8 Lamps	4	237.6	2600	1820	617.76	432.432	None Proposed	1	0.1144	482.768	86.9	$0.0	$7.5	$12.0	$0.0	$0.0	$12.0	$7.5	$19.5	$48.0	$30.0	$78.0	$0.0	$0
Westfield High School - Interior	001	Cafeteria	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	13	709.8	2600	1845.48	$332.2	Replace 32W T8 Lamps with 25W T8 Lamps	14	555.8	2600	1820	1445.08	1011.556	None Proposed	1	0.154	833.924	150.1	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$112.0	$70.0	$182.0	$0.0	$0
Westfield High School - Interior	001	Serving	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	44	73	2640	2600	6864	$1,235.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	44	1496	2600	1820	3889.6	2722.72	None Proposed	1	1.144	4141.28	745.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,860.0	$5,456.0	$8,316.0	$228.8	$660
Westfield High School - Interior	001	Dish Washing	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	40	600	2600	1560	$280.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	2600	1820	884	618.8	None Proposed	1	0.26	941.2	169.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$150
Westfield High School - Interior	001	Prep	75W Incandescent Fixture	12	4	900	2600	2340	$421.2	Replace 75W Incandescent Fixture with 13W CFL	12	156	2600	1820	405.6	283.92	None Proposed	1	0.744	2056.08	370.1	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$48.0	$75.0	$123.0	$256.0	$0
Westfield High School - Interior	001	Prep	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	33		1980	2600	5148	$926.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	33	1122	2600	1820	2917.2	2042.04	None Proposed	1	0.858	3105.96	559.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,145.0	$4,092.0	$6,237.0	$171.6	$495
Westfield High School - Interior	001	Pantry	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	11	175	2600	455	$81.9	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	5	100	2600	1820	260	182	None Proposed	1	0.075	273	49.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	001	Kitchen Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	37	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Westfield High School - Interior	001	Locker	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	001	Cafeteria 2	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	40	25	2400	2600	6240	$1,123.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	40	1360	2600	1820	3536	2475.2	None Proposed	1	1.04	3764.8	677.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,600.0	$4,960.0	$7,560.0	$208.0	$400
Westfield High School - Interior	001	Café Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	57	960	2600	2496	$449.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	2600	1820	1414.4	990.08	None Proposed	1	0.416	1505.92	271.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$160
Westfield High School - Interior	001	Stage Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	31	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	001	150	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	31	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	001	152	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	56	1080	500	540	$97.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	500	500	306	306	None Proposed	0	0.468	234	42.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	154	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	51	1080	500	540	$97.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	500	350	306	214.2	None Proposed	1	0.468	325.8	58.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	151	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	42	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	153	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	46	1080	500	540	$97.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	500	500	306	306	None Proposed	0	0.468	234	42.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	156	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	58	1080	8760	9460.8	$1,702.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	737.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	155	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	44	1080	8760	9460.8	$1,702.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	737.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	Girls	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	20	270	8760	2365.2	$425.7	Remove Ballast, Instal 3-17W LED Tube Retrofit Bulbs	3	153	8760	8760	1340.28	1340.28	None Proposed	0	0.117	1024.92	184.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$195.0	$522.0	$717.0	$23.4	$45
Westfield High School - Interior	001	158	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	40	180	8760	1576.8	$283.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	8760	8760	893.52	893.52	None Proposed	0	0.078	683.28	123.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Westfield High School - Interior	001	160	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	17	25	1020	8760	8935.2	$1,608.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	17	578	8760	8760	5063.28	5063.28	None Proposed	0	0.442	3871.92	696.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,105.0	$2,108.0	$3,213.0	$88.4	$170
Westfield High School - Interior	001	Boys	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	21	240	8760	2102.4	$378.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.104	911.04	164.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Westfield High School - Interior	001	Storage	3PL18	1		0	8760	0	$0.0	0	1	0	8760	8760	0	0	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	001	157	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	41	1080	8760	9460.8	$1,702.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	737.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Westfield High School - Interior	001	Janitors	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	5	35	3640	127.4	$22.9	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	3640	2548	72.8	50.96	None Proposed	1	0.015	76.44	13.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	001	159	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	35	630	500	315	$56.7	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	18	360	500	500	180	180	None Proposed	0	0.27	135	24.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Westfield High School - Interior	001	164 S	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	20	270	500	135	$24.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	3	153	500	350	76.5	53.55	None Proposed	1	0.117	81.45	14.7	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$195.0	$522.0	$717.0	$23.4	$45
Westfield High School - Interior	001	164 S	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1		90	500	45	$8.1	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	1	51	500	350	25.5	17.85	None Proposed	1	0.039	27.15	4.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$65.0	$174.0	$239.0	$7.8	$15
Westfield High School - Interior	001	161	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	365.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	163	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	2600	1591.2	1591.2	None Proposed	0	0.468	1216.8	219.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	Hall (160s)	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	16	1014	500	507	$91.3	Replace 32W T8 Lamps with 25W T8 Lamps	20	794	500	500	397	397	None Proposed	0	0.22	110	19.8	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$160.0	$100.0	$260.0	$0.0	$0
Westfield High School - Interior	001	165	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	39	1080	8760	9460.8	$1,702.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	737.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	001	167	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	45	1440	500	720	$129.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	500	350	408	285.6	None Proposed	1	0.624	434.4	78.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Westfield High School - Interior	001	166	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	21	41	1064.7	500	532.35	$95.8	Replace 32W T8 Lamps with 25W T8 Lamps	21	833.7	500	350	416.85	291.795	None Proposed	1	0.231	240.555	43.3	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$168.0	$105.0	$273.0	$0.0	$0
Westfield High School - Interior	001	Hall (190s)	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	19	29	1140	500	570	$102.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	19	646	500	350	323	226.1	None Proposed	1	0.494	343.9	61.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,235.0	$2,356.0	$3,591.0	$98.8	$190
Westfield High School - Interior	001	190	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	74	1440	500	720	$129.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	500	350	408	285.6	None Proposed	1	0.624	434.4	78.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$240
Westfield High School - Interior	001	190 P	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	18	300	500	150	$27.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	500	350	85	59.5	None Proposed	1	0.13	90.5	16.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	001	192	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	74	1440	500	720	$129.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	500	350	408	285.6	None Proposed	1	0.624	434.4	78.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Westfield High School - Interior	001	188	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	75	1440	500	720	$129.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	500	350	408	285.6	None Proposed	1	0.624	434.4	78.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Westfield High School - Interior	001	186	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	71	1440	500	720	$129.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	500	500	408	408	None Proposed	0	0.624	312	56.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Westfield High School - Interior	001	186 P	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		300	500	150	$27.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	500	350	85	59.5	None Proposed	1	0.13	90.5	16.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$75
Westfield High School - Interior	001	184	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	21	70	1890	500	945	$170.1	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	21	1071	500	350	535.5	374.85	None Proposed	1	0.819	570.15	102.6	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,365.0	$3,654.0	$5,019.0	$163.8	$315
Westfield High School - Interior	001	Girls	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	40	300	4380	1314	$236.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	4380	4380	744.6	744.6	None Proposed	0	0.13	569.4	102.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	001	Janitors	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	55	90	2600	234	$42.1	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	1	51	2600	1820	132.6	92.82	None Proposed	1	0.039	141.18	25.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$65.0	$174.0	$239.0	$7.8	$15
Westfield High School - Interior	001	Boys	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	58	300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	001	185 S	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	28	360	2600	936	$168.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Westfield High School - Interior	001	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6		360	2600	936	$168.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Westfield High School - Interior	001	Hall (190s)	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	24	61	2600	158.6	$28.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.027	96.72	17.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	001	Stairs (190s)	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16		960	2600	2496	$449.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	2600	1820	1414.4	990.08	None Proposed	1	0.416	1505.92	271.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$160
Westfield High School - Interior	003	394	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	67	2160	2600	5616	$1,010.9	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	2600	1820	3182.4	2227.68	None Proposed	1	0.936	3388.32	609.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360
Westfield High School - Interior	003	392	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	81	2160	2600	5616	$1,010.9	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	2600	1820	3182.4	2227.68	None Proposed	1	0.936	3388.32	609.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360
Westfield High School - Interior	003	392 P	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	28	300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$75
Westfield High School - Interior	003	Janitor's Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	27	22	1620	2600	4212	$758.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	27	918	2600	1820	2386.8	1670.76	None Proposed	1	0.702	2541.24	457.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,755.0	$3,348.0	$5,103.0	$140.4	$270
Westfield High School - Interior	003	Janitor's Hall	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		61	2600	158.6	$28.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.027	96.72	17.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	003	390	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	67	2160	2600	5616	$1,010.9	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	2600	1820	3182.4	2227.68	None Proposed	1	0.936	3388.32	609.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360
Westfield High School - Interior	003	388	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	63	2160	2600	5616	$1,010.9	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	2600	1820	3182.4	2227.68	None Proposed	1	0.936	3388.32	609.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360
Westfield High School - Interior	003	388 P	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	37	300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	003	Boys	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	40	300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	003	Girls	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	48	300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	003	Janitor's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	29	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	003	384 F	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	44	600	2600	1560	$280.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	2600	1820	884	618.8	None Proposed	1	0.26	941.2	169.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$100
Westfield High School - Interior	003	386	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	41	600	2600	1560	$280.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	2600	1820	884	618.8	None Proposed	1	0.26	941.2	169.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$100
Westfield High School - Interior	003	387 S	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	37	540	2600	1404	$252.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	152.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Westfield High School - Interior	003	385 S	NO ACCESS			0	500	0	$0.0	None Propoposed	0	0	500	350	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	003	382	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24		2160	500	1080	$194.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	500	350	612	428.4	None Proposed	1	0.936	651.6	117.3	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360
Westfield High School - Interior	003	380	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	53	1350	500	675	$121.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	15	765	500	500	382.5	382.5	None Proposed	0	0.585	292.5	52.7	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$975.0	$2,610.0	$3,585.0	$117.0	$225
Westfield High School - Interior	002	Phys Ed	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	41	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	500	204	204	None Proposed	0	0.312	156	28.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Westfield High School - Interior	002	Phys Ed	3PL18	1	41	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	500	17	17	None Proposed	0	0.026	13	2.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$0
Westfield High School - Interior	002	Phys Ed	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	20	35	500	17.5	$3.2	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	500	500	10	10	None Proposed	0	0.015	7.5	1.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	002	Locker Room	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	14	350	1560	546	$98.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	10	200	1560	1560	312	312	None Proposed	0	0.15	234	42.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$100
Westfield High School - Interior	002	Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	40	240	1560	374.4	$67.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	1560	1560	212.16	212.16	None Proposed	0	0.104	162.24	29.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Westfield High School - Interior	002	Lockers Stair	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		70	500	35	$6.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	500	500	20	20	None Proposed	0	0.03	15	2.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Westfield High School - Interior	002	Gym Stair	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	5		450	500	225	$40.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	5	255	500	350	127.5	89.25	None Proposed	1	0.195	135.75	24.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$325.0	$870.0	$1,195.0	$39.0	$75
Westfield High School - Interior	002	Library Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	40	810	500	405	$72.9	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	9	459	500	350	229.5	160.65	None Proposed	1	0.351	244.35	44.0	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$585.0	$1,566.0	$2,151.0	$70.2	$135
Westfield High School - Interior	002	Library Office	1X4 Suspended Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	28	1350	500	675	$121.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	15	765	500	500	382.5	382.5	None Proposed	0	0.585	292.5	52.7	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$975.0	$2,610.0	$3,585.0	$117.0	$225
Westfield High School - Interior	002	Library	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	94		5640	8760	49406.4	$8,893.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	94	3196	8760	8760	27996.96	27996.96	None Proposed	0	2.444	21409.44	3,853.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$6,110.0	$11,656.0	$17,766.0	$488.8	$1,410
Westfield High School - Interior	002	Library	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	70	36	4200	8760	36792	$6,622.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	70	2380	8760	8760	20848.8	20848.8	None Proposed	0	1.82	15943.2	2,869.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$4,550.0	$8,680.0	$13,230.0	$364.0	$1,050
Westfield High School - Interior	002	Library	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9		540	8760	4730.4	$851.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	8760	8760	2680.56	2680.56	None Proposed	0	0.234	2049.84	369.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Westfield High School - Interior	002	Library Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	40	1440	8760	12614.4	$2,270.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	8760	8760	7148.16	7148.16	None Proposed	0	0.624	5466.24	983.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$240

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Westfield High School - Interior	002	Photo	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	8760	9460.8	$1,702.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	737.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Westfield High School - Interior	002	Library Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	52	720	8760	6307.2	$1,135.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.312	2733.12	492.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Westfield High School - Interior	002	240	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	68	360	8760	3153.6	$567.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	8760	8760	1787.04	1787.04	None Proposed	0	0.156	1366.56	246.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Westfield High School - Interior	002	240	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	53	50.7	8760	444.132	$79.9	Replace 32W T8 Lamps with 25W T8 Lamps	1	39.7	8760	8760	347.772	347.772	None Proposed	0	0.011	96.36	17.3	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$8.0	$5.0	$13.0	$0.0	$0
Westfield High School - Interior	002	Janitor's	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		35	1560	54.6	$9.8	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	1560	1560	31.2	31.2	None Proposed	0	0.015	23.4	4.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	002	Hall	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	16	30	1440	1560	2246.4	$404.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	16	816	1560	1560	1272.96	1272.96	None Proposed	0	0.624	973.44	175.2	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,040.0	$2,784.0	$3,824.0	$124.8	$240
Westfield High School - Interior	002	Boys	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		300	1560	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	1560	1560	265.2	265.2	None Proposed	0	0.13	202.8	36.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	002	242	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	61	1350	1560	2106	$379.1	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	15	765	1560	1560	1193.4	1193.4	None Proposed	0	0.585	912.6	164.3	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$975.0	$2,610.0	$3,585.0	$117.0	$225
Westfield High School - Interior	002	242 Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	15	120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Westfield High School - Interior	002	239	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	54	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	39.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Westfield High School - Interior	002	242 F	NO ACCESS			0	500	0	$0.0	None Propopsed	0	0	500	350	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	002	23X Closet	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	30	35	3640	127.4	$22.9	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	3640	2548	72.8	50.96	None Proposed	1	0.015	76.44	13.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	002	236 B	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	57	120	3640	436.8	$78.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	3640	2548	247.52	173.264	None Proposed	1	0.052	263.536	47.4	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Westfield High School - Interior	002	236	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12		1080	3640	3931.2	$707.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	3640	2548	2227.68	1559.376	None Proposed	1	0.468	2371.824	426.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Westfield High School - Interior	002	237	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	88	2160	3640	7862.4	$1,415.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	3640	2548	4455.36	3118.752	None Proposed	1	0.936	4743.648	853.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360
Westfield High School - Interior	002	234	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	65	1080	3640	3931.2	$707.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	3640	2548	2227.68	1559.376	None Proposed	1	0.468	2371.824	426.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Westfield High School - Interior	002	232	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	60	1080	3640	3931.2	$707.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	3640	2548	2227.68	1559.376	None Proposed	1	0.468	2371.824	426.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Westfield High School - Interior	002	235	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	40	1350	3120	4212	$758.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	15	765	3120	3120	2386.8	2386.8	None Proposed	0	0.585	1825.2	328.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$975.0	$2,610.0	$3,585.0	$117.0	$225
Westfield High School - Interior	002	233	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	51	1350	3120	4212	$758.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	15	765	3120	3120	2386.8	2386.8	None Proposed	0	0.585	1825.2	328.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$975.0	$2,610.0	$3,585.0	$117.0	$225
Westfield High School - Interior	002	230	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	40	1080	3120	3369.6	$606.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	3120	3120	1909.44	1909.44	None Proposed	0	0.468	1460.16	262.8	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Westfield High School - Interior	002	Girl's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	25	480	3120	1497.6	$269.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	3120	3120	848.64	848.64	None Proposed	0	0.208	648.96	116.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Westfield High School - Interior	002	Janitor's	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	22	35	3120	109.2	$19.7	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	3120	3120	62.4	62.4	None Proposed	0	0.015	46.8	8.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	002	231	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	32	360	500	180	$32.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	500	350	102	71.4	None Proposed	1	0.156	108.6	19.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Westfield High School - Interior	002	223	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	37	240	500	120	$21.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	350	68	47.6	None Proposed	1	0.104	72.4	13.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Westfield High School - Interior	002	Art Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	22	240	500	120	$21.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	350	68	47.6	None Proposed	1	0.104	72.4	13.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Westfield High School - Interior	002	224	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	34	45	3060	3120	9547.2	$1,718.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	34	1734	3120	2184	5410.08	3787.056	None Proposed	1	1.326	5760.144	1,036.8	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$2,210.0	$5,916.0	$8,126.0	$265.2	$510
Westfield High School - Interior	002	Fan Room	26W CFL Fixture	8	8	208	3120	648.96	$116.8	None Proposed	8	208	3120	2184	648.96	454.272	None Proposed	1	0	194.688	35.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	002	250	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	37	180	3120	561.6	$101.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3120	3120	318.24	318.24	None Proposed	0	0.078	243.36	43.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Westfield High School - Interior	002	252	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	3120	1909.44	1909.44	None Proposed	0	0.468	1460.16	262.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	251	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	53	1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	3120	1909.44	1909.44	None Proposed	0	0.468	1460.16	262.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	254	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	30	1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	3120	1909.44	1909.44	None Proposed	0	0.468	1460.16	262.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	253	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	44	1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	3120	1909.44	1909.44	None Proposed	0	0.468	1460.16	262.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	256	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	3120	1909.44	1909.44	None Proposed	0	0.468	1460.16	262.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	255	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	365.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	258	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	24	1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	365.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	Girl's	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	46	270	3120	842.4	$151.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	3	153	3120	2184	477.36	334.152	None Proposed	1	0.117	508.248	91.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$195.0	$522.0	$717.0	$23.4	$45
Westfield High School - Interior	002	Boy's	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	46	360	3120	1123.2	$202.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	4	204	3120	2184	636.48	445.536	None Proposed	1	0.156	677.664	122.0	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$260.0	$696.0	$956.0	$31.2	$60
Westfield High School - Interior	002	Janitor's	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	17	35	500	17.5	$3.2	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	500	350	10	7	None Proposed	1	0.015	10.5	1.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	002	257	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	365.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Westfield High School - Interior	002	260	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	3120	1909.44	1909.44	None Proposed	0	0.468	1460.16	262.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Westfield High School - Interior	002	Custodian's Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	10	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Westfield High School - Interior	002	259	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	30	1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	365.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Westfield High School - Interior	002	262	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	24	1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	365.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Westfield High School - Interior	002	261	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	38	1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	365.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	262	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	38	900	2600	2340	$421.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	2600	2600	1326	1326	None Proposed	0	0.39	1014	182.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
Westfield High School - Interior	002	263	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	264	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15		900	2600	2340	$421.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	2600	1820	1326	928.2	None Proposed	1	0.39	1411.8	254.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
Westfield High School - Interior	002	265	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Westfield High School - Interior	002	266	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	21	44	1260	2600	3276	$589.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	21	714	2600	1820	1856.4	1299.48	None Proposed	1	0.546	1976.52	355.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,365.0	$2,604.0	$3,969.0	$109.2	$315
Westfield High School - Interior	002	267	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	51	1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$240
Westfield High School - Interior	002	289	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Westfield High School - Interior	002	290	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	86	2160	2600	5616	$1,010.9	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	2600	1820	3182.4	2227.68	None Proposed	1	0.936	3388.32	609.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360
Westfield High School - Interior	002	288	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	71	1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Westfield High School - Interior	002	288 P	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	002	286	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	71	2160	2600	5616	$1,010.9	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	2600	1820	3182.4	2227.68	None Proposed	1	0.936	3388.32	609.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Westfield High School - Interior	002	284	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	63	1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Westfield High School - Interior	002	284 P	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	002	283 S	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	13	360	2600	936	$168.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Westfield High School - Interior	002	Boy's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	002	Girl's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	002	Janitor's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	24	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Westfield High School - Interior	002	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	23		1380	2600	3588	$645.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	23	782	2600	1820	2033.2	1423.24	None Proposed	1	0.598	2164.76	389.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,495.0	$2,852.0	$4,347.0	$119.6	$230
Westfield High School - Interior	002	282	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24		1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Westfield High School - Interior	002	280	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24		1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Westfield High School - Interior	002	280 D	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Westfield High School - Interior	002	280 S	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	42	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Westfield High School - Interior	002	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9		540	2600	1404	$252.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	152.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Westfield High School - Interior	002	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		912.6	2600	2372.76	$427.1	Replace 32W T8 Lamps with 25W T8 Lamps	18	714.6	2600	1820	1857.96	1300.572	None Proposed	1	0.198	1072.188	193.0	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$144.0	$90.0	$234.0	$0.0	$0
Westfield High School - Interior	002	Counselor's Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	52	360	2600	936	$168.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	4	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$260.0	$696.0	$956.0	$31.2	$60
Westfield High School - Interior	002	Furniture	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	48	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Westfield High School - Interior	002	Faculty	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11	41	990	2600	2574	$463.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	11	561	2600	1820	1458.6	1021.02	None Proposed	1	0.429	1552.98	279.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$715.0	$1,914.0	$2,629.0	$85.8	$165
Westfield High School - Interior	002	241	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	76	1080	2600	2808	$505.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Westfield High School - Interior	002	244	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	18	83	1620	2600	4212	$758.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	18	918	2600	1820	2386.8	1670.76	None Proposed	1	0.702	2541.24	457.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,170.0	$3,132.0	$4,302.0	$140.4	$270
Westfield High School - Interior	002	245	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	18		1620	2600	4212	$758.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	18	918	2600	1820	2386.8	1670.76	None Proposed	1	0.702	2541.24	457.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,170.0	$3,132.0	$4,302.0	$140.4	$270
Westfield High School - Interior	002	248	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	18		1620	2600	4212	$758.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	18	918	2600	1820	2386.8	1670.76	None Proposed	1	0.702	2541.24	457.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,170.0	$3,132.0	$4,302.0	$140.4	$270
Westfield High School - Interior	002	249	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	21		1890	2600	4914	$884.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	21	1071	2600	1820	2784.6	1949.22	None Proposed	1	0.819	2964.78	533.7	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,365.0	$3,654.0	$5,019.0	$163.8	$315
Westfield High School - Interior	002	248 S	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	33	360	2600	936	$168.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	4	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$260.0	$696.0	$956.0	$31.2	$60
Westfield High School - Interior	002	Auditorium	3PL13	8		336	2600	873.6	$157.2	To be Replaced	8	0	2600	1820	0	0	None Proposed	1	0.336	873.6	157.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	002	Auditorium	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3		105	2600	273	$49.1	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	3	60	2600	1820	156	109.2	None Proposed	1	0.045	163.8	29.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Westfield High School - Interior	002	Auditorium	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6		360	2600	936	$168.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Westfield High School - Interior	002	Balcony Storage	26W CFL Fixture	3		78	2600	202.8	$36.5	None Proposed	3	78	2600	1820	202.8	141.96	None Proposed	1	0	60.84	11.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	002	222	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	44	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Westfield High School - Interior	002	220	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	52	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Westfield High School - Interior	003	Over Library	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	20	140	2600	364	$65.5	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	4	80	2600	1820	208	145.6	None Proposed	1	0.06	218.4	39.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Westfield High School - Interior	003	Teacher's Lounge	26W CFL Fixture	4		104	2600	270.4	$48.7	None Proposed	4	104	2600	1820	270.4	189.28	None Proposed	1	0	81.12	14.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Westfield High School - Interior	003	Restroom	3PL13	1	18	42	2600	109.2	$19.7	To be Replaced	1	0	2600	1820	0	0	None Proposed	1	0.042	109.2	19.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	000	Elevator Lobby	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	50	120	2600	312	$56.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Administration Building - Interior	000	Maintenance	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	69	540	2600	1404	$252.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	152.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$135
Administration Building - Interior	000	Faculty	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	42	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Administration Building - Interior	000	Wood Shop	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Administration Building - Interior	000	Hall	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	10	18	320	2600	832	$149.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	10	170	2600	1820	442	309.4	None Proposed	1	0.15	522.6	94.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$650.0	$740.0	$1,390.0	$26.0	$50
Administration Building - Interior	000	Boy's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	43	50.7	2600	131.82	$23.7	Replace 32W T8 Lamps with 25W T8 Lamps	1	39.7	2600	1820	103.22	72.254	None Proposed	1	0.011	59.566	10.7	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$8.0	$5.0	$13.0	$0.0	$0
Administration Building - Interior	000	Loading	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	45	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Administration Building - Interior	000	Stair	3PL13	8	5	336	2080	698.88	$125.8	To be Replaced	8	0	2080	2080	0	0	None Proposed	0	0.336	698.88	125.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	000	Storage	26W CFL Fixture	3	3	78	2080	162.24	$29.2	None Proposed	3	78	2080	1456	162.24	113.568	None Proposed	1	0	48.672	8.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	000	Gym	3PL13	8	13	336	500	168	$30.2	To be Replaced	8	0	500	350	0	0	None Proposed	1	0.336	168	30.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	000	Equipment	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	16	660	500	330	$59.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	11	374	500	350	187	130.9	None Proposed	1	0.286	199.1	35.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$715.0	$1,364.0	$2,079.0	$57.2	$165
Administration Building - Interior	000	Girl's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	20	120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Administration Building - Interior	000	IT	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	40	360	2080	748.8	$134.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2080	1456	424.32	297.024	None Proposed	1	0.156	451.776	81.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Administration Building - Interior	000	Server	26W CFL Fixture	1	2	26	2080	54.08	$9.7	None Proposed	1	26	2080	1456	54.08	37.856	None Proposed	1	0	16.224	2.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	000	11	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	76	840	3640	3057.6	$550.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	3640	3640	1732.64	1732.64	None Proposed	0	0.364	1324.96	238.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Administration Building - Interior	001	Elevator	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	30	70	3640	254.8	$45.9	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	3640	3640	145.6	145.6	None Proposed	0	0.03	109.2	19.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Administration Building - Interior	001	Kitchenette	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	36	60	3640	218.4	$39.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3640	3640	123.76	123.76	None Proposed	0	0.026	94.64	17.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Administration Building - Interior	001	Special	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	4	64	128	8760	1121.28	$201.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	4	68	8760	8760	595.68	595.68	None Proposed	0	0.06	525.6	94.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$260.0	$296.0	$556.0	$10.4	$20
Administration Building - Interior	001	Div Special	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	25	51	1500	8760	13140	$2,365.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	25	850	8760	8760	7446	7446	None Proposed	0	0.65	5694	1,024.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,625.0	$3,100.0	$4,725.0	$130.0	$250
Administration Building - Interior	001	Auditorium	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	33	120	8760	1051.2	$189.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	8760	8760	595.68	595.68	None Proposed	0	0.052	455.52	82.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Administration Building - Interior	001	Auditorium	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	35	360	8760	3153.6	$567.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	8760	8760	1787.04	1787.04	None Proposed	0	0.156	1366.56	246.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Administration Building - Interior	001	Stage	26W CFL Fixture	7	5	182	8760	1594.32	$287.0	None Proposed	7	182	8760	8760	1594.32	1594.32	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	001	Hall	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	8	18	256	8760	2242.56	$403.7	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	8	136	8760	8760	1191.36	1191.36	None Proposed	0	0.12	1051.2	189.2	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$520.0	$592.0	$1,112.0	$20.8	$40
Administration Building - Interior	001	Business	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	26	26	1560	8760	13665.6	$2,459.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	26	884	8760	8760	7743.84	7743.84	None Proposed	0	0.676	5921.76	1,065.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,690.0	$3,224.0	$4,914.0	$135.2	$390

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Administration Building - Interior	001	Copy	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	15	420	8760	3679.2	$662.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	8760	8760	2084.88	2084.88	None Proposed	0	0.182	1594.32	287.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$105
Administration Building - Interior	001	Purchasing	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	50	420	8760	3679.2	$662.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	8760	8760	2084.88	2084.88	None Proposed	0	0.182	1594.32	287.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$105
Administration Building - Interior	001	Board Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	14	71	1680	3120	$241.6	$943.5	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	14	952	3120	2184	2970.24	2079.168	None Proposed	1	0.728	3162.432	569.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$910.0	$3,136.0	$4,046.0	$145.6	$280
Administration Building - Interior	001	Kicthen 2	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1		32	3120	99.84	$18.0	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	1	17	3120	2184	53.04	37.128	None Proposed	1	0.015	62.712	11.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$65.0	$74.0	$139.0	$2.6	$5
Administration Building - Interior	001	Stair 2	3PL13	8	3	336	3120	1048.32	$188.7	To be Replaced	8	0	3120	2184	0	0	None Proposed	1	0.336	1048.32	188.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	002	Balcony	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	17	18	1020	500	510	$91.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	17	578	500	350	289	202.3	None Proposed	1	0.442	307.7	55.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,105.0	$2,108.0	$3,213.0	$88.4	$255
Administration Building - Interior	002	217	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	7	60	840	500	420	$75.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	7	476	500	350	238	166.6	None Proposed	1	0.364	253.4	45.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$455.0	$1,568.0	$2,023.0	$72.8	$140
Administration Building - Interior	002	217 C	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Administration Building - Interior	002	215	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	90	240	500	120	$21.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	350	68	47.6	None Proposed	1	0.104	72.4	13.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Administration Building - Interior	002	215	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	40	480	500	240	$43.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	4	272	500	350	136	95.2	None Proposed	1	0.208	144.8	26.1	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
Administration Building - Interior	002	Women's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	14	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Administration Building - Interior	002	Conference	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	18	120	3120	374.4	$67.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.052	225.888	40.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Administration Building - Interior	002	Conference	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	17	74	1020	500	510	$91.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	17	578	500	350	289	202.3	None Proposed	1	0.442	307.7	55.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,105.0	$2,108.0	$3,213.0	$88.4	$170
Administration Building - Interior	002	207	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	62	540	3120	1684.8	$303.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	3120	2184	954.72	668.304	None Proposed	1	0.234	1016.496	183.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$135
Administration Building - Interior	002	205	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	43	180	3120	561.6	$101.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3120	2184	318.24	222.768	None Proposed	1	0.078	338.832	61.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Administration Building - Interior	002	205 A	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	40	240	3120	748.8	$134.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	2	136	3120	2184	424.32	297.024	None Proposed	1	0.104	451.776	81.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$130.0	$448.0	$578.0	$20.8	$40
Administration Building - Interior	002	Men's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	25	120	3120	374.4	$67.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.052	225.888	40.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Administration Building - Interior	002	201	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	30	540	3120	1684.8	$303.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	3120	2184	954.72	668.304	None Proposed	1	0.234	1016.496	183.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$135
Administration Building - Interior	002	Elevator Lobby	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	35	122	3120	380.64	$68.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.054	232.128	41.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Administration Building - Interior	002	Elevator Lobby	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	35	122	3120	380.64	$68.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.054	232.128	41.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Administration Building - Interior	003	Elevator Lobby	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	35	122	3120	380.64	$68.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.054	232.128	41.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Administration Building - Interior	003	Hall	3PL13	9	5	378	3120	1179.36	$212.3	To be Replaced	9	0	3120	2184	0	0	None Proposed	1	0.378	1179.36	212.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	003	ESL 303	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	8		256	3120	798.72	$143.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	8	136	3120	2184	424.32	297.024	None Proposed	1	0.12	501.696	90.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$520.0	$592.0	$1,112.0	$20.8	$40
Administration Building - Interior	003	305	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	38	480	3120	1497.6	$269.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	3120	2184	848.64	594.048	None Proposed	1	0.208	903.552	162.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Administration Building - Interior	003	305	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	3120	374.4	$67.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	2184	212.16	148.512	None Proposed	1	0.052	225.888	40.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Administration Building - Interior	003	307	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	27	180	500	90	$16.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	500	350	51	35.7	None Proposed	1	0.078	54.3	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Administration Building - Interior	003	304	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	8	41	256	3120	798.72	$143.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	8	136	3120	2184	424.32	297.024	None Proposed	1	0.12	501.696	90.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$520.0	$592.0	$1,112.0	$20.8	$40
Administration Building - Interior	003	311	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	10	108	1200	8760	10512	$1,892.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	10	680	8760	8760	5956.8	5956.8	None Proposed	0	0.52	4555.2	819.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$650.0	$2,240.0	$2,890.0	$104.0	$200
Administration Building - Interior	003	Roof Stairs	26W CFL Fixture	2		52	8760	455.52	$82.0	None Proposed	2	52	8760	8760	455.52	455.52	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	B	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	28	360	500	180	$32.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	500	350	102	71.4	None Proposed	1	0.156	108.6	19.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Administration Building - Interior	000	Garage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16		960	500	480	$86.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	500	350	272	190.4	None Proposed	1	0.416	289.6	52.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$240
Administration Building - Interior	000	Garage	200W CFL Fixure	4		800	500	400	$72.0	None Proposed	4	800	500	350	400	280	None Proposed	1	0	120	21.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	003	300 / 302	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	16	30	512	500	256	$46.1	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	16	272	500	350	136	95.2	None Proposed	1	0.24	160.8	28.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,040.0	$1,184.0	$2,224.0	$41.6	$80
Administration Building - Interior	003	301	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	8	25	684.8	500	342.4	$61.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	500	350	136	95.2	None Proposed	1	0.4128	247.2	44.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$0
Administration Building - Interior	003	309	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	9	40	288	500	144	$25.9	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	9	153	500	350	76.5	53.55	None Proposed	1	0.135	90.45	16.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$585.0	$666.0	$1,251.0	$23.4	$45
Administration Building - Interior	003	309	26W CFL Fixture	8		208	500	104	$18.7	None Proposed	8	208	500	350	104	72.8	None Proposed	1	0	31.2	5.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Administration Building - Interior	003	306	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	21	240	3120	748.8	$134.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	3120	2184	424.32	297.024	None Proposed	1	0.104	451.776	81.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Administration Building - Interior	003	313	1X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	10	79	1200	500	600	$108.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	10	680	500	350	340	238	None Proposed	1	0.52	362	65.2	$24.0	$400.0	$65.0	$0.0	$0.0	$65.0	$424.0	$489.0	$650.0	$4,240.0	$4,890.0	$104.0	$200
Tamaques Elementary School - Interior	001	Main Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	87	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	39.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Tamaques Elementary School - Interior	001	Principal's Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	76	600	500	300	$54.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	500	350	170	119	None Proposed	1	0.26	181	32.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$150
Tamaques Elementary School - Interior	001	Hall	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8		488	500	244	$43.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	500	350	136	95.2	None Proposed	1	0.216	148.8	26.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Tamaques Elementary School - Interior	001	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15		900	500	450	$81.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	500	350	255	178.5	None Proposed	1	0.39	271.5	48.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$150
Tamaques Elementary School - Interior	001	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$75
Tamaques Elementary School - Interior	001	Pantry	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	100	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Tamaques Elementary School - Interior	001	Gym	400W Metal Halide Fixture	20	18	9160	2600	23816	$4,286.9	None Proposed.	20	9160	2600	1820	23816	16671.2	None Proposed	1	0	7144.8	1,286.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Tamaques Elementary School - Interior	001	Simones	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	25	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Tamaques Elementary School - Interior	001	Faculty	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	106	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Tamaques Elementary School - Interior	001	Women's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	20	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Tamaques Elementary School - Interior	001	Men's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Tamaques Elementary School - Interior	001	113	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	48	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	114	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	49	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	Stage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3		180	2600	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	50.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Tamaques Elementary School - Interior	001	Closet	26W CFL Fixture	2		52	2600	135.2	$24.3	None Proposed	2	52	2600	1820	135.2	94.64	None Proposed	1	0	40.56	7.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Tamaques Elementary School - Interior	001	Vestibule	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16		976	2600	2537.6	$456.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	2600	1820	1414.4	990.08	None Proposed	1	0.432	1547.52	278.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$160
Tamaques Elementary School - Interior	001	101	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	23	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Tamaques Elementary School - Interior	001	102	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	70	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	103	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	31	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	112	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	38	68	2280	2600	5928	$1,067.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	38	1292	2600	1820	3359.2	2351.44	None Proposed	1	0.988	3576.56	643.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,470.0	$4,712.0	$7,182.0	$197.6	$570
Tamaques Elementary School - Interior	001	Speech	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	69	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Tamaques Elementary School - Interior	001	104	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	74	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	21	21	1260	2600	3276	$589.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	21	714	2600	1820	1856.4	1299.48	None Proposed	1	0.546	1976.52	355.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,365.0	$2,604.0	$3,969.0	$109.2	$315
Tamaques Elementary School - Interior	001	3-5 E	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	76	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	105	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	88	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	109	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	106	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	78	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	107	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	77	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4		240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Tamaques Elementary School - Interior	001	108	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Tamaques Elementary School - Interior	001	Stairs	26W CFL Fixture	2	46	52	2600	135.2	$24.3	None Proposed	2	52	2600	1820	135.2	94.64	None Proposed	1	0	40.56	7.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Tamaques Elementary School - Interior	001	Stairs	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	45	1350	2600	3510	$631.8	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	15	765	2600	1820	1989	1392.3	None Proposed	1	0.585	2117.7	381.2	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$975.0	$2,610.0	$3,585.0	$117.0	$225
Tamaques Elementary School - Interior	002	208	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	18		3081.6	2600	8012.16	$1,442.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	18	1224	2600	1820	3182.4	2227.68	None Proposed	1	1.8576	5784.48	1,041.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$1,170.0	$4,032.0	$5,202.0	$187.2	$0
Tamaques Elementary School - Interior	002	207	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts			0	2600	0	$0.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	0	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$0.0	$0.0	$0.0	$0.0	$0
Tamaques Elementary School - Interior	002	Hall	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	44	760.5	2600	1977.3	$355.9	Replace 32W T8 Lamps with 25W T8 Lamps	15	595.5	2600	1820	1548.3	1083.81	None Proposed	1	0.165	893.49	160.8	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$120.0	$75.0	$195.0	$0.0	$0
Tamaques Elementary School - Interior	002	206	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	60	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	002	209	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	002	205	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	002	210	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	002	204	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	52	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	002	211	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	65	1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Tamaques Elementary School - Interior	002	203	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	18		576	2600	1497.6	$269.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	18	306	2600	1820	795.6	556.92	None Proposed	1	0.27	940.68	169.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,170.0	$1,332.0	$2,502.0	$46.8	$90
Tamaques Elementary School - Interior	002	212	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	18	72	576	2600	1497.6	$269.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	18	306	2600	1820	795.6	556.92	None Proposed	1	0.27	940.68	169.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,170.0	$1,332.0	$2,502.0	$46.8	$90
Tamaques Elementary School - Interior	002	202	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	18	50	576	2600	1497.6	$269.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	18	306	2600	1820	795.6	556.92	None Proposed	1	0.27	940.68	169.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,170.0	$1,332.0	$2,502.0	$46.8	$90
Tamaques Elementary School - Interior	002	213	1X4 Suspended Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	2600	2808	$505.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Tamaques Elementary School - Interior	002	201	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	18		2160	2600	5616	$1,010.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	18	1224	2600	1820	3182.4	2227.68	None Proposed	1	0.936	3388.32	609.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$1,170.0	$4,032.0	$5,202.0	$187.2	$360
Tamaques Elementary School - Interior	001	Stair	3PL13	3		126	500	63	$11.3	To be Replaced	3	0	500	350	0	0	None Proposed	1	0.126	63	11.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Tamaques Elementary School - Interior	001	Stair	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Tamaques Elementary School - Interior	001	Health Office	NO ACCESS			0	3120	0	$0.0	None Propoposed	0	0	3120	2184	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Tamaques Elementary School - Interior	001	Boys	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	24	244	8760	2137.44	$384.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.108	946.08	170.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Tamaques Elementary School - Interior	001	Girls	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	20	244	8760	2137.44	$384.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.108	946.08	170.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Tamaques Elementary School - Interior	002	Boys	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	24	244	8760	2137.44	$384.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.108	946.08	170.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Tamaques Elementary School - Interior	002	Girls	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	20	244	8760	2137.44	$384.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.108	946.08	170.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Tamaques Elementary School - Interior	001	Main Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	93	1080	8760	9460.8	$1,702.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	737.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Jefferson Elementary School - Interior	001	Office Bath	70W Incandescent Fixture	1	45	70	8760	613.2	$110.4	Replace 70W Incandescent Fixture with	1	0	8760	8760	0	0	None Proposed	0	0.07	613.2	110.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Jefferson Elementary School - Interior	001	Health Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	55	360	8760	3153.6	$567.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	3	204	8760	8760	1787.04	1787.04	None Proposed	0	0.156	1366.56	246.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$195.0	$672.0	$867.0	$31.2	$60
Jefferson Elementary School - Interior	001	Bath	26W CFL Fixture	1	14	26	500	13	$2.3	None Proposed	1	26	500	500	13	13	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Jefferson Elementary School - Interior	001	14	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	31	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	39.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	17	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	35	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	39.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	15	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	30	1440	500	720	$129.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	350	408	285.6	None Proposed	1	0.624	434.4	78.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Jefferson Elementary School - Interior	001	18	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	35	1440	500	720	$129.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	350	408	285.6	None Proposed	1	0.624	434.4	78.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Jefferson Elementary School - Interior	001	16	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	58	1440	500	720	$129.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	350	408	285.6	None Proposed	1	0.624	434.4	78.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Jefferson Elementary School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	12	420	500	210	$37.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	500	350	119	83.3	None Proposed	1	0.182	126.7	22.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$105
Jefferson Elementary School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	16	600	500	300	$54.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	500	350	170	119	None Proposed	1	0.26	181	32.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$150
Jefferson Elementary School - Interior	001	Boy's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	48	240	3120	748.8	$134.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	3120	2184	424.32	297.024	None Proposed	1	0.104	451.776	81.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Jefferson Elementary School - Interior	001	Girl's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	27	240	4380	1051.2	$189.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	4380	4380	595.68	595.68	None Proposed	0	0.104	455.52	82.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Jefferson Elementary School - Interior	001	Custodian's Closet	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		61	2600	158.6	$28.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.027	96.72	17.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Jefferson Elementary School - Interior	001	20	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	37	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Jefferson Elementary School - Interior	001	22	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	57	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Jefferson Elementary School - Interior	001	19	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	62	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Jefferson Elementary School - Interior	001	21	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	49	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Jefferson Elementary School - Interior	001	23	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	50	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Jefferson Elementary School - Interior	001	24	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	51	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Jefferson Elementary School - Interior	001	Storage	26W CFL Fixture	3	8	78	2600	202.8	$36.5	None Proposed	3	78	2600	1820	202.8	141.96	None Proposed	1	0	60.84	11.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Jefferson Elementary School - Interior	001	Boy's	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	35	120	2600	312	$56.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Jefferson Elementary School - Interior	001	Girl's	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	11	90	2600	234	$42.1	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	1	51	2600	1820	132.6	92.82	None Proposed	1	0.039	141.18	25.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$65.0	$174.0	$239.0	$7.8	$15
Jefferson Elementary School - Interior	001	Supply	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	3	12	96	2600	249.6	$44.9	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	3	51	2600	1820	132.6	92.82	None Proposed	1	0.045	156.78	28.2	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$195.0	$222.0	$417.0	$7.8	$15
Jefferson Elementary School - Interior	001	13	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	18	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Jefferson Elementary School - Interior	001	12	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	32	360	2600	936	$168.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Jefferson Elementary School - Interior	001	11	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	45	960	2600	2496	$449.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	2600	1820	1414.4	990.08	None Proposed	1	0.416	1505.92	271.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$160
Jefferson Elementary School - Interior	001	Teacher's Lounge	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	50	360	2600	936	$168.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	4	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$260.0	$696.0	$956.0	$31.2	$60
Jefferson Elementary School - Interior	001	Teacher's Bath	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	65	61	2600	158.6	$28.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.027	96.72	17.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Jefferson Elementary School - Interior	001	Adult Bath	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	60	120	2600	312	$56.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Jefferson Elementary School - Interior	001	10	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	50	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	9	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	27	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	8	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	7	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	Work	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	61	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Jefferson Elementary School - Interior	001	Janitor's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	7	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Jefferson Elementary School - Interior	001	6	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	27	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	14	1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$240
Jefferson Elementary School - Interior	001	Gym	4' T5 Fixture w/6 T5FO28 Lamps	8	37	1440	2600	3744	$673.9	None Proposed.	8	1280	2600	1820	3328	2329.6	None Proposed	1	0.16	1414.4	254.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Jefferson Elementary School - Interior	001	Stage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	11	360	2600	936	$168.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	101.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Jefferson Elementary School - Interior	001	Girl's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	55	180	2600	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	50.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Jefferson Elementary School - Interior	001	Boy's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	16	180	2600	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	50.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Jefferson Elementary School - Interior	001	Speech	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	78	180	2600	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	50.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Jefferson Elementary School - Interior	001	5	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	12		1027.2	2600	2670.72	$480.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.6192	1928.16	347.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$0
Jefferson Elementary School - Interior	001	4	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	46	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	3	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	2	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	1	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		732	2600	1903.2	$342.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.324	1160.64	208.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Jefferson Elementary School - Interior	001	Conference	13W CFL Fixture	1	32	13	2600	33.8	$6.1	None Proposed	1	13	2600	1820	33.8	23.66	None Proposed	1	0	10.14	1.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Jefferson Elementary School - Interior	001	A	1x8 Fixture w/ 2-T8 Lamps w/ Electronic Ballasts	8	41	960	2600	2496	$449.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.688	2000.96	360.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Jefferson Elementary School - Interior	001	A	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	41	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Jefferson Elementary School - Interior	001	AB Bath	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4		240	2080	499.2	$89.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2080	2080	282.88	282.88	None Proposed	0	0.104	216.32	38.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Jefferson Elementary School - Interior	001	AB Closet	3PL13	2		84	2080	174.72	$31.4	To be Replaced	2	0	2080	1456	0	0	None Proposed	1	0.084	174.72	31.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Jefferson Elementary School - Interior	001	B	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3		180	3120	561.6	$101.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3120	2184	318.24	222.768	None Proposed	1	0.078	338.832	61.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Jefferson Elementary School - Interior	001	B	1x8 Fixture w/ 2-T8 Lamps w/ Electronic Ballasts	1		120	3640	436.8	$78.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3640	3640	123.76	123.76	None Proposed	0	0.086	313.04	56.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Jefferson Elementary School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	18	720	3640	2620.8	$471.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	3640	3640	1485.12	1485.12	None Proposed	0	0.312	1135.68	204.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Jefferson Elementary School - Interior	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	47	180	3640	655.2	$117.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3640	3640	371.28	371.28	None Proposed	0	0.078	283.92	51.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Jefferson Elementary School - Interior	001	Kitchen	3PL13	1		42	3640	152.88	$27.5	To be Replaced	1	0	3640	3640	0	0	None Proposed	0	0.042	152.88	27.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Jefferson Elementary School - Interior	001	Boiler Room	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	6	20	192	3120	599.04	$107.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	6	102	3120	2184	318.24	222.768	None Proposed	1	0.09	376.272	67.7	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$390.0	$444.0	$834.0	$15.6	$30
Jefferson Elementary School - Interior	001	Janitor's Office	3PL13	1	18	42	3120	131.04	$23.6	To be Replaced	1	0	3120	2184	0	0	None Proposed	1	0.042	131.04	23.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	002	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	13	22	780	3120	2433.6	$389.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	13	442	3120	2184	1379.04	965.328	None Proposed	1	0.338	1468.272	234.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$845.0	$1,612.0	$2,457.0	$67.6	$195
Edison Intermediate School - Interior	002	AV 229	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	54	360	3120	1123.2	$179.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	3120	2184	636.48	445.536	None Proposed	1	0.156	677.664	108.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Edison Intermediate School - Interior	002	Projection	3PL13	1	6	42	8760	367.92	$58.9	To be Replaced	1	0	8760	8760	0	0	None Proposed	0	0.042	367.92	58.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	002	233	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	71	480	8760	4204.8	$672.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	8760	8760	2382.72	2382.72	None Proposed	0	0.208	1822.08	291.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Edison Intermediate School - Interior	002	234	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	69	360	8760	3153.6	$504.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	8760	8760	1787.04	1787.04	None Proposed	0	0.156	1366.56	218.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Edison Intermediate School - Interior	002	235	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	36	64	2160	8760	18921.6	$3,027.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	36	1224	8760	8760	10722.24	10722.24	None Proposed	0	0.936	8199.36	1,311.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,340.0	$4,464.0	$6,804.0	$187.2	$540
Edison Intermediate School - Interior	002	238	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	21	63	1260	8760	11037.6	$1,766.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	21	714	8760	8760	6254.64	6254.64	None Proposed	0	0.546	4782.96	765.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,365.0	$2,604.0	$3,969.0	$109.2	$315
Edison Intermediate School - Interior	002	237	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	21	70	1260	3120	3931.2	$629.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	21	714	3120	2184	2227.68	1559.376	None Proposed	1	0.546	2371.824	379.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,365.0	$2,604.0	$3,969.0	$109.2	$315
Edison Intermediate School - Interior	002	Utility	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	11	210	3120	655.2	$104.8	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	6	120	3120	2184	374.4	262.08	None Proposed	1	0.09	393.12	62.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Edison Intermediate School - Interior	002	239	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	22	60	3120	187.2	$30.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3120	3120	106.08	106.08	None Proposed	0	0.026	81.12	13.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Edison Intermediate School - Interior	002	239	150W Incandescent Fixture	1	20	150	3120	468	$74.9	Replace 150W Incandescent Fixture with 25W CFL	1	25	3120	3120	78	78	None Proposed	0	0.125	390	62.4	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Edison Intermediate School - Interior	002	Stair	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	11	175	500	87.5	$14.0	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	5	100	500	350	50	35	None Proposed	1	0.075	52.5	8.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Edison Intermediate School - Interior	002	232	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	10	68	1200	500	600	$96.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	10	680	500	350	340	238	None Proposed	1	0.52	362	57.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$650.0	$2,240.0	$2,890.0	$104.0	$200
Edison Intermediate School - Interior	002	231	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	54	1080	500	540	$86.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	500	350	306	214.2	None Proposed	1	0.468	325.8	52.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Edison Intermediate School - Interior	002	Library	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	48	68	2880	2600	7488	$1,198.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	48	1632	2600	1820	4243.2	2970.24	None Proposed	1	1.248	4517.76	722.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$3,120.0	$5,952.0	$9,072.0	$249.6	$720
Edison Intermediate School - Interior	002	230	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	48	1080	2600	2808	$449.3	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	271.1	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Edison Intermediate School - Interior	002	Utility	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	16	180	2600	468	$74.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	45.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Edison Intermediate School - Interior	002	Utility	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		35	2600	91	$14.6	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	8.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Edison Intermediate School - Interior	002	Girl's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	40	427	3120	1332.24	$213.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	3120	2184	742.56	519.792	None Proposed	1	0.189	812.448	130.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$70
Edison Intermediate School - Interior	002	Boy's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	61	427	500	213.5	$34.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	500	500	119	119	None Proposed	0	0.189	94.5	15.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$70
Edison Intermediate School - Interior	002	226	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	60	1080	500	540	$86.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	500	500	306	306	None Proposed	0	0.468	234	37.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Edison Intermediate School - Interior	002	225	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	56	840	8760	7358.4	$1,177.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	8760	8760	4169.76	4169.76	None Proposed	0	0.364	3188.64	510.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Edison Intermediate School - Interior	002	224	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	71	1080	500	540	$86.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	500	350	306	214.2	None Proposed	1	0.468	325.8	52.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Edison Intermediate School - Interior	002	223	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14		840	500	420	$67.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	500	350	238	166.6	None Proposed	1	0.364	253.4	40.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Edison Intermediate School - Interior	002	222	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18		1080	500	540	$86.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	500	350	306	214.2	None Proposed	1	0.468	325.8	52.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Edison Intermediate School - Interior	002	221	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	54	1220	500	610	$97.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	500	350	340	238	None Proposed	1	0.54	372	59.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$200
Edison Intermediate School - Interior	002	219	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20		1014	500	507	$81.1	Replace 32W T8 Lamps with 25W T8 Lamps	20	794	500	350	397	277.9	None Proposed	1	0.22	229.1	36.7	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$160.0	$100.0	$260.0	$0.0	$0
Edison Intermediate School - Interior	002	220	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	70	1080	3640	3931.2	$629.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3640	2548	2227.68	1559.376	None Proposed	1	0.468	2371.824	379.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$270
Edison Intermediate School - Interior	002	Stair	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	9	175	2600	455	$72.8	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	5	100	2600	1820	260	182	None Proposed	1	0.075	273	43.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Edison Intermediate School - Interior	002	Hall	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	27	305	2600	793	$126.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.135	483.6	77.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Edison Intermediate School - Interior	002	Hall	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	52	23	1664	2600	4326.4	$692.2	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	52	884	2600	1820	2298.4	1608.88	None Proposed	1	0.78	2717.52	434.8	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$3,380.0	$3,848.0	$7,228.0	$135.2	$260
Edison Intermediate School - Interior	002	Stair	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	17	366	2600	951.6	$152.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.162	580.32	92.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Edison Intermediate School - Interior	002	200	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	49	360	2600	936	$149.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	90.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Edison Intermediate School - Interior	002	202	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	69	840	2600	2184	$349.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	2600	1820	1237.6	866.32	None Proposed	1	0.364	1317.68	210.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Edison Intermediate School - Interior	002	201	13W CFL Fixture	8	52	104	2600	270.4	$43.3	None Proposed	8	104	2600	1820	270.4	189.28	None Proposed	1	0	81.12	13.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	002	203	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	49	1440	2600	3744	$599.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	361.4	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Edison Intermediate School - Interior	002	204	13W CFL Fixture	12	55	156	2600	405.6	$64.9	None Proposed	12	156	2600	1820	405.6	283.92	None Proposed	1	0	121.68	19.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	002	206	13W CFL Fixture	14	67	182	2600	473.2	$75.7	None Proposed	14	182	2600	1820	473.2	331.24	None Proposed	1	0	141.96	22.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	002	205	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	14	51	1198.4	2600	3115.84	$498.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	2600	1820	1237.6	866.32	None Proposed	1	0.7224	2249.52	359.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$0
Edison Intermediate School - Interior	002	208	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	60	840	2600	2184	$349.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	2600	1820	1237.6	866.32	None Proposed	1	0.364	1317.68	210.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Edison Intermediate School - Interior	002	207	2X2 Fixtures w/ 4-17W T8 Lamps w/ Electronic Ballasts	14	51	882	2600	2293.2	$366.9	Remove Ballast, Install 4-10W LED Tube Retrofit Bulbs	14	560	2600	1820	1456	1019.2	None Proposed	1	0.322	1274	203.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$910.0	$3,136.0	$4,046.0	$145.6	$280
Edison Intermediate School - Interior	002	210	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	11		990	2600	2574	$411.8	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	11	561	2600	1820	1458.6	1021.02	None Proposed	1	0.429	1552.98	248.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$715.0	$1,914.0	$2,629.0	$85.8	$165
Edison Intermediate School - Interior	002	209	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	54	840	2600	2184	$349.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	2600	1820	1237.6	866.32	None Proposed	1	0.364	1317.68	210.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Edison Intermediate School - Interior	002	211	65W Incandescent Fixture	2	30	130	2600	338	$54.1	Replace 65W Incandescent Fixture with 13W CFL	2	26	2600	1820	67.6	47.32	None Proposed	1	0.104	290.68	46.5	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$8.0	$12.5	$20.5	$42.7	$0
Edison Intermediate School - Interior	002	213	65W Incandescent Fixture	6	29	390	2600	1014	$162.2	Replace 65W Incandescent Fixture with 13W CFL	6	78	2600	1820	202.8	141.96	None Proposed	1	0.312	872.04	139.5	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$24.0	$37.5	$61.5	$128.0	$0
Edison Intermediate School - Interior	002	Janitor's Closet 8	26W CFL Fixture	1	10	26	2600	67.6	$10.8	None Proposed	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	002	Janitor's Closet 9	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1		120	2600	312	$49.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	30.1	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Edison Intermediate School - Interior	002	Stair	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6		360	2600	936	$149.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	90.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Edison Intermediate School - Interior	001	Entry	70W Incandescent Fixture	1		70	2600	182	$29.1	Replace 70W Incandescent Fixture with	1	0	2600	1820	0	0	None Proposed	1	0.07	182	29.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	001	Janitor's Closet 5	26W CFL Fixture	1	11	26	2600	67.6	$10.8	None Proposed	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	001	Hall	13W CFL Fixture	5	10	65	2600	169	$27.0	None Proposed	5	65	2600	1820	169	118.3	None Proposed	1	0	50.7	8.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	001	Hall	4' T5 Fixture w/6 T5FO28 Lamps	19		3420	2600	8892	$1,422.7	None Proposed.	19	3040	2600	1820	7904	5532.8	None Proposed	1	0.38	3359.2	537.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	001	Gym	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	24	51	2160	2600	5616	$898.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	24	1224	2600	1820	3182.4	2227.68	None Proposed	1	0.936	3388.32	542.1	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$1,560.0	$4,176.0	$5,736.0	$187.2	$360
Edison Intermediate School - Interior	001	Locker	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	23		1380	2600	3588	$574.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	23	782	2600	1820	2033.2	1423.24	None Proposed	1	0.598	2164.76	346.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,495.0	$2,852.0	$4,347.0	$119.6	$230
Edison Intermediate School - Interior	001	Locker Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	67	240	2600	624	$99.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	60.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Edison Intermediate School - Interior	001	Locker	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3		270	2600	702	$112.3	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	3	153	2600	1820	397.8	278.46	None Proposed	1	0.117	423.54	67.8	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$195.0	$522.0	$717.0	$23.4	$45
Edison Intermediate School - Interior	001	Locker Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	41	240	2600	624	$99.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	60.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Edison Intermediate School - Interior	001	Locker Room 2	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	32	1800	2600	4680	$748.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	30	1020	2600	1820	2652	1856.4	None Proposed	1	0.78	2823.6	451.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,950.0	$3,720.0	$5,670.0	$156.0	$300
Edison Intermediate School - Interior	001	Locker Room 2	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10		350	2600	910	$145.6	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	10	200	2600	1820	520	364	None Proposed	1	0.15	546	87.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$100
Edison Intermediate School - Interior	001	Janitor's Closet 3	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	17	35	500	17.5	$2.8	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	500	350	10	7	None Proposed	1	0.015	10.5	1.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Edison Intermediate School - Interior	001	114	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	20	77	2400	500	1200	$192.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	20	1360	500	350	680	476	None Proposed	1	1.04	724	115.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$1,300.0	$4,480.0	$5,780.0	$208.0	$400
Edison Intermediate School - Interior	001	114 Closet	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	20	61	8760	534.36	$85.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.027	236.52	37.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Edison Intermediate School - Interior	001	116	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	46	1830	8760	16030.8	$2,564.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	30	1020	8760	8760	8935.2	8935.2	None Proposed	0	0.81	7095.6	1,135.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,950.0	$3,720.0	$5,670.0	$156.0	$300
Edison Intermediate School - Interior	001	113	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	46	1220	8760	10687.2	$1,710.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	8760	8760	5956.8	5956.8	None Proposed	0	0.54	4730.4	756.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$200
Edison Intermediate School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	26	11	1560	8760	13665.6	$2,186.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	26	884	8760	8760	7743.84	7743.84	None Proposed	0	0.676	5921.76	947.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,690.0	$3,224.0	$4,914.0	$135.2	$390
Edison Intermediate School - Interior	001	118	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	55	1440	8760	12614.4	$2,018.3	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	8760	8760	7148.16	7148.16	None Proposed	0	0.624	5466.24	874.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Edison Intermediate School - Interior	001	115	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	15	65	1800	500	900	$144.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	15	1020	500	500	510	510	None Proposed	0	0.78	390	62.4	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$975.0	$3,360.0	$4,335.0	$156.0	$300
Edison Intermediate School - Interior	001	117	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	41	720	500	360	$57.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	500	204	204	None Proposed	0	0.312	156	25.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Edison Intermediate School - Interior	001	120	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	34	48	2040	500	1020	$163.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	34	1156	500	350	578	404.6	None Proposed	1	0.884	615.4	98.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,210.0	$4,216.0	$6,426.0	$176.8	$510

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Edison Intermediate School - Interior	001	120 Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	55	270	8760	2365.2	$378.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	3	153	8760	8760	1340.28	1340.28	None Proposed	0	0.117	1024.92	164.0	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$195.0	$522.0	$717.0	$23.4	$45
Edison Intermediate School - Interior	001	119	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	34	46	2074	8760	18168.24	$2,906.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	34	1156	8760	8760	10126.56	10126.56	None Proposed	0	0.918	8041.68	1,286.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,210.0	$4,216.0	$6,426.0	$176.8	$340
Edison Intermediate School - Interior	001	122	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	33	70	1980	500	990	$158.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	33	1122	500	350	561	392.7	None Proposed	1	0.858	597.3	95.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,145.0	$4,092.0	$6,237.0	$171.6	$495
Edison Intermediate School - Interior	001	Girl's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	26	305	500	152.5	$24.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	500	350	85	59.5	None Proposed	1	0.135	93	14.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Edison Intermediate School - Interior	001	Boy's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	24	305	2600	793	$126.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.135	483.6	77.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Edison Intermediate School - Interior	001	121	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	11	105	2600	273	$43.7	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	3	60	2600	1820	156	109.2	None Proposed	1	0.045	163.8	26.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Edison Intermediate School - Interior	001	Hall	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	34	19	1088	2600	2828.8	$452.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	34	578	2600	1820	1502.8	1051.96	None Proposed	1	0.51	1776.84	284.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$2,210.0	$2,516.0	$4,726.0	$88.4	$170
Edison Intermediate School - Interior	001	Café	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	84	27	5124	2600	13322.4	$2,131.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	84	2856	2600	1820	7425.6	5197.92	None Proposed	1	2.268	8124.48	1,299.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$5,460.0	$10,416.0	$15,876.0	$436.8	$840
Edison Intermediate School - Interior	001	Café	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	34	240	2600	624	$99.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	2	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	60.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$130.0	$448.0	$578.0	$20.8	$40
Edison Intermediate School - Interior	001	Serving	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	14	240	2600	624	$99.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	60.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Edison Intermediate School - Interior	001	Serving	70W Incandescent Fixture	9	10	630	2600	1638	$262.1	Replace 70W Incandescent Fixture with	9	0	2600	1820	0	0	None Proposed	1	0.63	1638	262.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	001	Prep	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	26	480	2600	1248	$199.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	120.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Edison Intermediate School - Interior	001	Prep	70W Incandescent Fixture	8	16	560	2600	1456	$233.0	Replace 70W Incandescent Fixture with	8	0	2600	1820	0	0	None Proposed	1	0.56	1456	233.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	001	Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	2600	312	$49.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	30.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Edison Intermediate School - Interior	001	Entry	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	9	35	2600	91	$14.6	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	8.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Edison Intermediate School - Interior	001	Janitor's Closet 2	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	26	60	2600	156	$25.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	15.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Edison Intermediate School - Interior	001	Teacher's Women	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	24	180	2600	468	$74.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	45.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Edison Intermediate School - Interior	001	123	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	38	720	2600	1872	$299.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	180.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Edison Intermediate School - Interior	001	Faculty	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	62	720	2600	1872	$299.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	180.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Edison Intermediate School - Interior	001	Teacher's Men	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	14	180	2600	468	$74.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	45.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Edison Intermediate School - Interior	001	125	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	84	1220	2600	3172	$507.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	2600	1820	1768	1237.6	None Proposed	1	0.54	1934.4	309.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$200
Edison Intermediate School - Interior	001	127	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	9	140	2600	364	$58.2	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	4	80	2600	1820	208	145.6	None Proposed	1	0.06	218.4	34.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Edison Intermediate School - Interior	001	128	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	15	240	2600	624	$99.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	60.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Edison Intermediate School - Interior	001	Janitor's Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	20	120	2600	312	$49.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	30.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Edison Intermediate School - Interior	001	100	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	50	360	2600	936	$149.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	3	204	2600	1820	530.4	371.28	None Proposed	1	0.156	564.72	90.4	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$195.0	$672.0	$867.0	$31.2	$60
Edison Intermediate School - Interior	001	102	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	52	720	2600	1872	$299.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	180.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Edison Intermediate School - Interior	001	101	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	49	660	2600	1716	$274.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	11	374	2600	1820	972.4	680.68	None Proposed	1	0.286	1035.32	165.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$715.0	$1,364.0	$2,079.0	$57.2	$110
Edison Intermediate School - Interior	001	104	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	42	660	2600	1716	$274.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	11	374	2600	1820	972.4	680.68	None Proposed	1	0.286	1035.32	165.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$715.0	$1,364.0	$2,079.0	$57.2	$110
Edison Intermediate School - Interior	001	103	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	42	720	8760	6307.2	$1,009.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.312	2733.12	437.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Edison Intermediate School - Interior	001	106	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	75	1080	8760	9460.8	$1,513.7	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	655.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Edison Intermediate School - Interior	001	105	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	48	720	8760	6307.2	$1,009.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.312	2733.12	437.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Edison Intermediate School - Interior	001	108	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	57	840	3120	2620.8	$419.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	3120	2184	1485.12	1039.584	None Proposed	1	0.364	1581.216	253.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Edison Intermediate School - Interior	001	107	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	46	709.8	500	354.9	$56.8	Replace 32W T8 Lamps with 25W T8 Lamps	14	555.8	500	350	277.9	194.53	None Proposed	1	0.154	160.37	25.7	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$112.0	$70.0	$182.0	$0.0	$0
Edison Intermediate School - Interior	001	110	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	52	840	500	420	$67.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	500	350	238	166.6	None Proposed	1	0.364	253.4	40.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Edison Intermediate School - Interior	001	109	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	43	840	500	420	$67.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	14	476	500	500	238	238	None Proposed	0	0.364	182	29.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$910.0	$1,736.0	$2,646.0	$72.8	$210
Edison Intermediate School - Interior	001	Hall	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	20	19	640	500	320	$51.2	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	20	340	500	500	170	170	None Proposed	0	0.3	150	24.0	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,300.0	$1,480.0	$2,780.0	$52.0	$100
Edison Intermediate School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	500	360	$57.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	34.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Edison Intermediate School - Interior	001	Main Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	10	70	1200	500	600	$96.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	10	680	500	350	340	238	None Proposed	1	0.52	362	57.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$650.0	$2,240.0	$2,890.0	$104.0	$200
Edison Intermediate School - Interior	001	Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	44	120	500	60	$9.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	5.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Edison Intermediate School - Interior	001	Office	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	21	72	672	2600	1747.2	$279.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	21	357	2600	2600	928.2	928.2	None Proposed	0	0.315	819	131.0	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,365.0	$1,554.0	$2,919.0	$54.6	$105
Edison Intermediate School - Interior	001	Office	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	30	175	500	87.5	$14.0	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	5	100	500	350	50	35	None Proposed	1	0.075	52.5	8.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Edison Intermediate School - Interior	001	Elevator Machine Room	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	15	35	500	17.5	$2.8	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	500	350	10	7	None Proposed	1	0.015	10.5	1.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Edison Intermediate School - Interior	001	Health Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	56	244	500	122	$19.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	500	68	68	None Proposed	0	0.108	54	8.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Edison Intermediate School - Interior	001	Health Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	5	95	600	500	300	$48.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	5	340	500	500	170	170	None Proposed	0	0.26	130	20.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$325.0	$1,120.0	$1,445.0	$52.0	$100
Edison Intermediate School - Interior	001	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	11	600	500	300	$48.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	500	500	170	170	None Proposed	0	0.26	130	20.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$100
Edison Intermediate School - Interior	001	Men's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	25	180	1560	280.8	$44.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	1560	1560	159.12	159.12	None Proposed	0	0.078	121.68	19.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Edison Intermediate School - Interior	001	Women's	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	25	180	1560	280.8	$44.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	1560	1560	159.12	159.12	None Proposed	0	0.078	121.68	19.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Edison Intermediate School - Interior	001	130	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	19	56	1140	1560	1778.4	$284.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	19	646	1560	1560	1007.76	1007.76	None Proposed	0	0.494	770.64	123.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,235.0	$2,356.0	$3,591.0	$98.8	$285
Edison Intermediate School - Interior	001	131	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	75	1200	1560	1872	$299.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	1560	1560	1060.8	1060.8	None Proposed	0	0.52	811.2	129.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$300
Edison Intermediate School - Interior	001	132	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	21	71	1797.6	1560	2804.256	$448.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	21	714	1560	1560	1113.84	1113.84	None Proposed	0	1.0836	1690.416	270.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,365.0	$2,604.0	$3,969.0	$109.2	$0
Edison Intermediate School - Interior	001	133	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	48	1521	1560	2372.76	$379.6	Replace 32W T8 Lamps with 25W T8 Lamps	30	1191	1560	1560	1857.96	1857.96	None Proposed	0	0.33	514.8	82.4	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$240.0	$150.0	$390.0	$0.0	$0
Edison Intermediate School - Interior	001	133 Closet	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	12	70	1560	109.2	$17.5	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	1560	1560	62.4	62.4	None Proposed	0	0.03	46.8	7.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Edison Intermediate School - Interior	001	Stage	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	8		256	500	128	$20.5	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	8	136	500	500	68	68	None Proposed	0	0.12	60	9.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$520.0	$592.0	$1,112.0	$20.8	$40
Edison Intermediate School - Interior	001	Auditorium	LED Fixture 40W	14		560	3120	1747.2	$279.6	None Proposed.	14	560	3120	3120	1747.2	1747.2	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Edison Intermediate School - Interior	001	Auditorium	LED Fixture 40W	74		2960	3120	9235.2	$1,477.6	None Proposed.	74	2960	3120	3120	9235.2	9235.2	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Edison Intermediate School - Interior	001	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	12	120	3160	379.2	$60.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3160	3160	214.88	214.88	None Proposed	0	0.052	164.32	26.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Kehler Stadium Field House - Interior	001	Entry	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	22	122	4300	524.6	$94.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	4300	4300	292.4	292.4	None Proposed	0	0.054	232.2	41.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Kehler Stadium Field House - Interior	001	Bathroom	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	14	32	4300	137.6	$24.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	1	17	4300	4300	73.1	73.1	None Proposed	0	0.015	64.5	11.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$65.0	$74.0	$139.0	$2.6	$5
Kehler Stadium Field House - Interior	001	Locker	2x4 Fixture w/ 4 T-5 Lamps w/ Electronic Ballasts	6	96	0	4300	0	$0.0	0	6	0	4300	4300	0	0	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Kehler Stadium Field House - Interior	001	Vestibule	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	73	120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Kehler Stadium Field House - Interior	001	Training	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	41	660	1560	1029.6	$185.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	11	374	1560	1560	583.44	583.44	None Proposed	0	0.286	446.16	80.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$715.0	$1,364.0	$2,079.0	$57.2	$165
Kehler Stadium Field House - Interior	001	Training	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	40	720	1560	1123.2	$202.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	6	408	1560	1560	636.48	636.48	None Proposed	0	0.312	486.72	87.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$390.0	$1,344.0	$1,734.0	$62.4	$120
Kehler Stadium Field House - Interior	001	Shower	200W Incandescent Fixture	1	11	200	1560	312	$56.2	Replace 200W Incandescent Fxiture with	1	0	1560	1560	0	0	None Proposed	0	0.2	312	56.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Kehler Stadium Field House - Interior	002	Coach's Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	5	36	600	1560	936	$168.5	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	5	340	1560	1560	530.4	530.4	None Proposed	0	0.26	405.6	73.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$325.0	$1,120.0	$1,445.0	$52.0	$100
Kehler Stadium Field House - Interior	001	Stair	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	20	35	8760	306.6	$55.2	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	8760	8760	175.2	175.2	None Proposed	0	0.015	131.4	23.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Kehler Stadium Field House - Interior	001	Locker 2	2x4 Fixture w/ 4 T-5 Lamps w/ Electronic Ballasts	6	104	0	500	0	$0.0	0	6	0	500	350	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Kehler Stadium Field House - Interior	001	Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	38	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Kehler Stadium Field House - Interior	001	Vestibule	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	27	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Kehler Stadium Field House - Interior	001	Storage	200W Incandescent Fixture	3	4	600	500	300	$54.0	Replace 200W Incandescent Fxiture with	3	0	500	350	0	0	None Proposed	1	0.6	300	54.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Kehler Stadium Field House - Interior	B	Boiler Room	200W Incandescent Fixture	1		200	3120	624	$112.3	Replace 200W Incandescent Fxiture with	1	0	3120	2184	0	0	None Proposed	1	0.2	624	112.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Kehler Stadium Field House - Interior	001	Locker	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	21	120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Kehler Stadium Field House - Interior	001	Bath	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	40	61	500	30.5	$5.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.027	18.6	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Kehler Stadium Field House - Interior	001	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	38	122	500	61	$11.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.054	37.2	6.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Kehler Stadium Field House - Interior	001	Office 2	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	47	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Kehler Stadium Field House - Interior	001	Office 2	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Kehler Stadium Field House - Interior	001	Office 3	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	37	120	4380	525.6	$94.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	4380	4380	297.84	297.84	None Proposed	0	0.052	227.76	41.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Kehler Stadium Field House - Interior	001	Weightroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	30	63	1830	4380	8015.4	$1,442.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	30	1020	4380	4380	4467.6	4467.6	None Proposed	0	0.81	3547.8	638.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,950.0	$3,720.0	$5,670.0	$156.0	$300
Kehler Stadium Field House - Interior	001	Weightroom	26W CFL Fixture	5		130	4380	569.4	$102.5	None Proposed	5	130	4380	4380	569.4	569.4	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Kehler Stadium Field House - Interior	001	Mechanical Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	18	61	4380	267.18	$48.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	4380	4380	148.92	148.92	None Proposed	0	0.027	118.26	21.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Kehler Stadium Field House - Interior	001	Locker	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	34	43	2074	2600	5392.4	$970.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	34	1156	2600	1820	3005.6	2103.92	None Proposed	1	0.918	3288.48	591.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,210.0	$4,216.0	$6,426.0	$176.8	$340
Kehler Stadium Field House - Interior	000	Showers	2PL18	8	25	0	2600	0	$0.0	0	8	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Kehler Stadium Field House - Interior	000	Entry	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	45	420	500	210	$37.8	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	12	240	500	500	120	120	None Proposed	0	0.18	90	16.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Wilson Elementary School - Interior	001	Entry	26W CFL Fixture	2	16	52	500	26	$4.9	None Proposed	2	52	500	500	26	26	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	43	180	500	90	$17.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	500	500	51	51	None Proposed	0	0.078	39	7.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Wilson Elementary School - Interior	001	Principal's Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	27	180	500	90	$17.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	500	500	51	51	None Proposed	0	0.078	39	7.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Wilson Elementary School - Interior	001	Principal's Bath	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	48	61	500	30.5	$5.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	500	17	17	None Proposed	0	0.027	13.5	2.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Wilson Elementary School - Interior	001	Office Bath	3PL13	1	12	42	500	21	$4.0	To be Replaced	1	0	500	500	0	0	None Proposed	0	0.042	21	4.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Closet	26W CFL Fixture	3	48	78	500	39	$7.4	None Proposed	3	78	500	500	39	39	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	103	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	35	1200	500	600	$114.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	500	500	340	340	None Proposed	0	0.52	260	49.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$300
Wilson Elementary School - Interior	001	102	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20		1200	3120	3744	$711.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	3120	3120	2121.6	2121.6	None Proposed	0	0.52	1622.4	308.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$300
Wilson Elementary School - Interior	001	106	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	73	1200	3120	3744	$711.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	3120	3120	2121.6	2121.6	None Proposed	0	0.52	1622.4	308.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$200
Wilson Elementary School - Interior	001	106 Closet	26W CFL Fixture	1	11	26	3120	81.12	$15.4	None Proposed	1	26	3120	3120	81.12	81.12	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	101	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20		1200	3120	3744	$711.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	3120	3120	2121.6	2121.6	None Proposed	0	0.52	1622.4	308.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$300
Wilson Elementary School - Interior	001	11	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	21	44	1260	8760	11037.6	$2,097.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	21	714	8760	8760	6254.64	6254.64	None Proposed	0	0.546	4782.96	908.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,365.0	$2,604.0	$3,969.0	$109.2	$315
Wilson Elementary School - Interior	001	Storage	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		35	8760	306.6	$58.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	8760	8760	175.2	175.2	None Proposed	0	0.015	131.4	25.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Wilson Elementary School - Interior	001	Janitor's Closet	3PL13	1	6	42	8760	367.92	$69.9	To be Replaced	1	0	8760	8760	0	0	None Proposed	0	0.042	367.92	69.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Speech	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	47	60	8760	525.6	$99.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.026	227.76	43.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Wilson Elementary School - Interior	001	Speech	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	47	122	3640	444.08	$84.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3640	2548	247.52	173.264	None Proposed	1	0.054	270.816	51.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Wilson Elementary School - Interior	001	Speech Bath	26W CFL Fixture	1	20	26	500	13	$2.5	None Proposed	1	26	500	500	13	13	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Server	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	30	120	500	60	$11.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Wilson Elementary School - Interior	001	Art Supply	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	38	120	500	60	$11.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Wilson Elementary School - Interior	001	Library	2PL18	27	32	0	2600	0	$0.0	0	27	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Library	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	25	38	1525	2600	3965	$753.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	25	850	2600	1820	2210	1547	None Proposed	1	0.675	2418	459.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,625.0	$3,100.0	$4,725.0	$130.0	$250
Wilson Elementary School - Interior	001	116	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	80	1080	3120	3369.6	$640.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	3120	2184	1909.44	1336.608	None Proposed	1	0.468	2032.992	386.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Wilson Elementary School - Interior	001	115	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	50	1080	8760	9460.8	$1,797.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	778.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Wilson Elementary School - Interior	001	114	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	91	1080	8760	9460.8	$1,797.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	778.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Wilson Elementary School - Interior	001	113	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	75	1080	500	540	$102.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	500	350	306	214.2	None Proposed	1	0.468	325.8	61.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Wilson Elementary School - Interior	001	113 Bath	26W CFL Fixture	1	15	26	500	13	$2.5	None Proposed	1	26	500	350	13	9.1	None Proposed	1	0	3.9	0.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	114 Bath	26W CFL Fixture	1		26	500	13	$2.5	None Proposed	1	26	500	350	13	9.1	None Proposed	1	0	3.9	0.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	115 Bath	26W CFL Fixture	1	6	26	500	13	$2.5	None Proposed	1	26	500	500	13	13	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Wilson Elementary School - Interior	001	116 Bath	26W CFL Fixture	1	3	26	500	13	$2.5	None Proposed	1	26	500	500	13	13	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Nurse's Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	35	427	500	213.5	$40.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	500	500	119	119	None Proposed	0	0.189	94.5	18.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$70
Wilson Elementary School - Interior	001	Girl's	1X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	7	42	630	500	315	$59.9	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	7	357	500	500	178.5	178.5	None Proposed	0	0.273	136.5	25.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$455.0	$1,218.0	$1,673.0	$54.6	$105
Wilson Elementary School - Interior	001	103 Closet	26W CFL Fixture	1		26	500	13	$2.5	None Proposed	1	26	500	350	13	9.1	None Proposed	1	0	3.9	0.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	102 Closet	26W CFL Fixture	1		26	2600	67.6	$12.8	None Proposed	1	26	2600	2600	67.6	67.6	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	101 Closet	26W CFL Fixture	1	10	26	2600	67.6	$12.8	None Proposed	1	26	2600	2600	67.6	67.6	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	112	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	72	1080	2600	2808	$533.5	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	321.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Wilson Elementary School - Interior	001	111	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	64	1080	2600	2808	$533.5	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	321.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Wilson Elementary School - Interior	001	112 Bath	26W CFL Fixture	1		26	2600	67.6	$12.8	None Proposed	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	111 Bath	26W CFL Fixture	1	7	26	2600	67.6	$12.8	None Proposed	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Women's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	34	180	2600	468	$88.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	53.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Wilson Elementary School - Interior	001	Men's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	36	180	2600	468	$88.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	53.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Wilson Elementary School - Interior	001	117	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$355.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	214.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Wilson Elementary School - Interior	001	118	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	52	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$135
Wilson Elementary School - Interior	001	119	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9		1080	2600	2808	$533.5	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	321.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Wilson Elementary School - Interior	001	120	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	63	1440	2600	3744	$711.4	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	429.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Wilson Elementary School - Interior	001	121	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	53	1080	2600	2808	$533.5	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	321.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Wilson Elementary School - Interior	001	122	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	40	1440	2080	2995.2	$569.1	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2080	1456	1697.28	1188.096	None Proposed	1	0.624	1807.104	343.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Wilson Elementary School - Interior	001	Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	37	60	1560	93.6	$17.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	1560	1560	53.04	53.04	None Proposed	0	0.026	40.56	7.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Wilson Elementary School - Interior	001	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	35	25	2100	1560	3276	$622.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	35	1190	1560	1560	1856.4	1856.4	None Proposed	0	0.91	1419.6	269.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,275.0	$4,340.0	$6,615.0	$182.0	$350
Wilson Elementary School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	16	55	960	2080	1996.8	$379.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	16	544	2080	1456	1131.52	792.064	None Proposed	1	0.416	1204.736	228.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,040.0	$1,984.0	$3,024.0	$83.2	$240
Wilson Elementary School - Interior	001	107	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	30	1200	3640	4368	$829.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	3640	3640	2475.2	2475.2	None Proposed	0	0.52	1892.8	359.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$300
Wilson Elementary School - Interior	001	104	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	41	1200	3120	3744	$711.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	3120	3120	2121.6	2121.6	None Proposed	0	0.52	1622.4	308.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$300
Wilson Elementary School - Interior	001	105	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	29	900	500	450	$85.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	15	510	500	350	255	178.5	None Proposed	1	0.39	271.5	51.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$975.0	$1,860.0	$2,835.0	$78.0	$225
Wilson Elementary School - Interior	001	105 Closet	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1		120	500	60	$11.4	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Wilson Elementary School - Interior	001	Reading	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	43	360	8760	3153.6	$599.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	8760	8760	1787.04	1787.04	None Proposed	0	0.156	1366.56	259.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Wilson Elementary School - Interior	001	Auditorium	2x4 Fixture w/ 4 T-5 Lamps w/ Electronic Ballasts	12	47	0	8760	0	$0.0	0	12	0	8760	8760	0	0	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Stage	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	4	20	128	8760	1121.28	$213.0	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	4	68	8760	8760	595.68	595.68	None Proposed	0	0.06	525.6	99.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$260.0	$296.0	$556.0	$10.4	$20
Wilson Elementary School - Interior	001	Stage	3PL13	2		84	8760	735.84	$139.8	To be Replaced	2	0	8760	8760	0	0	None Proposed	0	0.084	735.84	139.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Guidance	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	16	120	8760	1051.2	$199.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	8760	8760	595.68	595.68	None Proposed	0	0.052	455.52	86.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Wilson Elementary School - Interior	001	Lobby	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	11	60	8760	525.6	$99.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.026	227.76	43.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Wilson Elementary School - Interior	001	Stair	3PL13	2	10	84	1560	131.04	$24.9	To be Replaced	2	0	1560	1560	0	0	None Proposed	0	0.084	131.04	24.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	001	Stair	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		70	3640	254.8	$48.4	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	3640	2548	145.6	101.92	None Proposed	1	0.03	152.88	29.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Wilson Elementary School - Interior	001	Stair	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	8	70	8760	613.2	$116.5	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	8760	8760	350.4	350.4	None Proposed	0	0.03	262.8	49.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Wilson Elementary School - Interior	001	Stair	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		70	3120	218.4	$41.5	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	3120	2184	124.8	87.36	None Proposed	1	0.03	131.04	24.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Wilson Elementary School - Interior	001	Janitor's Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	44	60	500	30	$5.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Wilson Elementary School - Interior	001	Staff Men's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	40	61	500	30.5	$5.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.027	18.6	3.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Wilson Elementary School - Interior	001	Boy's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	38	427	500	213.5	$40.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	500	350	119	83.3	None Proposed	1	0.189	130.2	24.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$70
Wilson Elementary School - Interior	001	Exit	26W CFL Fixture	2	7	52	2600	135.2	$25.7	None Proposed	2	52	2600	1820	135.2	94.64	None Proposed	1	0	40.56	7.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	B	Boiler Room	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	10	4	320	2600	832	$158.1	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	10	170	2600	1820	442	309.4	None Proposed	1	0.15	522.6	99.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$650.0	$740.0	$1,390.0	$26.0	$50
Wilson Elementary School - Interior	B	Boiler Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	12	240	2600	624	$118.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	2	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	71.5	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$130.0	$448.0	$578.0	$20.8	$40
Wilson Elementary School - Interior	002	Storage	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	3	32	2600	83.2	$15.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	1	17	2600	1820	44.2	30.94	None Proposed	1	0.015	52.26	9.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$65.0	$74.0	$139.0	$2.6	$5
Wilson Elementary School - Interior	002	East Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	25	120	2600	312	$59.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	35.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Wilson Elementary School - Interior	002	Women's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	66	610	2600	1586	$301.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	2600	1820	884	618.8	None Proposed	1	0.27	967.2	183.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$100
Wilson Elementary School - Interior	002	Janitor's Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	38	60	2600	156	$29.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	17.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Wilson Elementary School - Interior	002	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	36	720	2600	1872	$355.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	214.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Wilson Elementary School - Interior	002	204	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	70	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$135
Wilson Elementary School - Interior	002	204 Closet	26W CFL Fixture	1	3	26	2600	67.6	$12.8	None Proposed	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	002	201	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	56	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Wilson Elementary School - Interior	002	202	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	61	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Wilson Elementary School - Interior	002	205	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	55	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Wilson Elementary School - Interior	002	203	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	58	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Wilson Elementary School - Interior	002	Picture Booth	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	1	32	2600	83.2	$15.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	1	17	2600	1820	44.2	30.94	None Proposed	1	0.015	52.26	9.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$65.0	$74.0	$139.0	$2.6	$5
Wilson Elementary School - Interior	002	West Storage	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	54	120	2600	312	$59.3	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	35.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Wilson Elementary School - Interior	002	Janitor's Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	2600	156	$29.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	17.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Wilson Elementary School - Interior	002	Boy's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10		507	2600	1318.2	$250.5	Replace 32W T8 Lamps with 25W T8 Lamps	10	397	2600	1820	1032.2	722.54	None Proposed	1	0.11	595.66	113.2	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$80.0	$50.0	$130.0	$0.0	$0
Wilson Elementary School - Interior	002	Faculty	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	60	240	2600	624	$118.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	2	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	71.5	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$130.0	$448.0	$578.0	$20.8	$40
Wilson Elementary School - Interior	002	Faculty	40W Incandescent Fixture	6		240	2600	624	$118.6	Replace 40W Incandescent Fixture with 13W CFL	6	78	2600	1820	202.8	141.96	None Proposed	1	0.162	482.04	91.6	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$24.0	$37.5	$61.5	$128.0	$0
Wilson Elementary School - Interior	002	Stock Room	1x4 Fixture w/ 4 T-5 Lamps w/ Electronic Ballasts	2		0	2600	0	$0.0	0	2	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	002	203 Closet	26W CFL Fixture	1		26	2600	67.6	$12.8	None Proposed	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Wilson Elementary School - Interior	002	Book Room	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	15	32	2600	83.2	$15.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	1	17	2600	1820	44.2	30.94	None Proposed	1	0.015	52.26	9.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$65.0	$74.0	$139.0	$2.6	$5
Lincoln Elementary School - Interior	001	Entry	6PL13	1	70	0	2600	0	$0.0	To be Replaced	1	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	001	Entry	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	70	90	2600	234	$42.1	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	1	51	2600	1820	132.6	92.82	None Proposed	1	0.039	141.18	25.4	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$65.0	$174.0	$239.0	$7.8	$15
Lincoln Elementary School - Interior	001	Stair B1	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	10	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Lincoln Elementary School - Interior	003	304	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	003	304	2x2 CFL	4							4						None Proposed																	
Lincoln Elementary School - Interior	003	304 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	60	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	003	305	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	003	305	2x2 CFL	4		0	2600	0	$0.0	0	4	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	003	305 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	60	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	003	Staff	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	54	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	003	303	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	64	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Lincoln Elementary School - Interior	003	303	2x2 CFL	4		0	2600	0	$0.0	0	4	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	003	303 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	53	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	003	306	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	61	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Lincoln Elementary School - Interior	003	306	2x2 CFL	4		0	2600	0	$0.0	0	4	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	003	306 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	59	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	003	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	42	660	2600	1716	$308.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	11	374	2600	1820	972.4	680.68	None Proposed	1	0.286	1035.32	186.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$715.0	$1,364.0	$2,079.0	$57.2	$110
Lincoln Elementary School - Interior	003	302	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	64	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Lincoln Elementary School - Interior	003	302	2x2 CFL	4		0	3640	0	$0.0	0	4	0	3640	3640	0	0	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	003	302 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	47	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	003	307	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6		360	500	180	$32.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	500	350	102	71.4	None Proposed	1	0.156	108.6	19.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Lincoln Elementary School - Interior	003	308	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	75	720	8760	6307.2	$1,135.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.312	2733.12	492.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	003	308	2x2 CFL	4		0	8760	0	$0.0	0	4	0	8760	8760	0	0	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	003	308 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	65	60	8760	525.6	$94.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.026	227.76	41.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	003	301	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	65	720	8760	6307.2	$1,135.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.312	2733.12	492.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	003	301	2x2 CFL	4		0	8760	0	$0.0	0	4	0	8760	8760	0	0	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	003	301 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	26	60	3120	187.2	$33.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3120	3120	106.08	106.08	None Proposed	0	0.026	81.12	14.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	003	Stair D	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	14	480	3120	1497.6	$269.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	3120	3120	848.64	848.64	None Proposed	0	0.208	648.96	116.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$120
Lincoln Elementary School - Interior	003	Mechanical Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	24	120	3120	374.4	$67.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	3120	3120	212.16	212.16	None Proposed	0	0.052	162.24	29.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Lincoln Elementary School - Interior	002	201	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	82	720	8760	6307.2	$1,135.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.312	2733.12	492.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	002	201	2x2 CFL	4		0	500	0	$0.0	0	4	0	500	350	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	002	201 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	47	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	500	17	17	None Proposed	0	0.026	13	2.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	002	208	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	75	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	39.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	002	208	2x2 CFL	4		0	8760	0	$0.0	0	4	0	8760	8760	0	0	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	002	208 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	49	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	002	Mechanical Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	22	120	500	60	$10.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	350	34	23.8	None Proposed	1	0.052	36.2	6.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Lincoln Elementary School - Interior	002	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	46	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	39.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	002	207	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	36	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	2600	176.8	176.8	None Proposed	0	0.052	135.2	24.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Lincoln Elementary School - Interior	002	202	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	56	480	3120	1497.6	$269.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	3120	2184	848.64	594.048	None Proposed	1	0.208	903.552	162.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Lincoln Elementary School - Interior	002	202	2x2 CFL	3		0	2600	0	$0.0	0	3	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	002	202 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	68	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	002	206	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	30	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Lincoln Elementary School - Interior	002	Mechanical Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	28	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Lincoln Elementary School - Interior	002	203	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	55	540	2600	1404	$252.7	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	6	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	152.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$390.0	$1,044.0	$1,434.0	$46.8	$90
Lincoln Elementary School - Interior	002	Staff	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	46	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	002	204	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	002	204	2x2 CFL	4		0	2600	0	$0.0	0	4	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	002	204 Bath	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	55	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Lincoln Elementary School - Interior	002	205	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	105	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Lincoln Elementary School - Interior	002	205	2x2 CFL	4		0	2600	0	$0.0	0	4	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	002	205 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	44	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	001	101	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12		720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	001	101	2x2 CFL	4		0	2600	0	$0.0	0	4	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	001	101 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	001	Fire Pump	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	30	180	2600	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	50.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Lincoln Elementary School - Interior	B	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	16	600	2600	1560	$280.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	2600	1820	884	618.8	None Proposed	1	0.26	941.2	169.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$150
Lincoln Elementary School - Interior	001	Nurse's Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	50	300	2600	780	$140.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.13	470.6	84.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Lincoln Elementary School - Interior	001	Nurse Bath	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	11	120	2600	312	$56.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Lincoln Elementary School - Interior	001	Nurse	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		122	2600	317.2	$57.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.054	193.44	34.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Lincoln Elementary School - Interior	001	102	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	77	720	2600	1872	$337.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Lincoln Elementary School - Interior	001	102	2x2 CFL	4		0	2600	0	$0.0	0	4	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	001	102 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	48	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	001	103	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12		1080	2600	2808	$505.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	304.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Lincoln Elementary School - Interior	001	103	2x2 CFL	4		0	2600	0	$0.0	0	4	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	001	103 Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	001	Restroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	45	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Lincoln Elementary School - Interior	001	Auditorium	6PL13	12	30	0	2600	0	$0.0	To be Replaced	12	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	001	Auditorium	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	40	720	2600	1872	$337.0	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	8	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	203.3	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$520.0	$1,392.0	$1,912.0	$62.4	$120
Lincoln Elementary School - Interior	001	Auditorium	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	20	480	2600	1248	$224.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Lincoln Elementary School - Interior	001	Main Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	7	50	630	2600	1638	$294.8	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	7	357	2600	1820	928.2	649.74	None Proposed	1	0.273	988.26	177.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$455.0	$1,218.0	$1,673.0	$54.6	$105
Lincoln Elementary School - Interior	001	Main Office	2PL18	2		0	2600	0	$0.0	0	2	0	2600	1820	0	0	None Proposed	1	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Lincoln Elementary School - Interior	001	Main Bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Franklin Elementary School - Interior	001	105	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	75	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Franklin Elementary School - Interior	001	104	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	78	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Franklin Elementary School - Interior	001	103	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	87	540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Franklin Elementary School - Interior	001	102	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9		540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Franklin Elementary School - Interior	001	101	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9		540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Franklin Elementary School - Interior	001	Library	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	47	45	2820	2600	7332	$1,393.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	47	1598	2600	1820	4154.8	2908.36	None Proposed	1	1.222	4423.64	840.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$3,055.0	$5,828.0	$8,883.0	$244.4	$705
Franklin Elementary School - Interior	001	111	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9		540	2600	1404	$266.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	2600	1820	795.6	556.92	None Proposed	1	0.234	847.08	160.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Franklin Elementary School - Interior	001	118	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	37	1080	2080	2246.4	$426.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2080	2080	1272.96	1272.96	None Proposed	0	0.468	973.44	185.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Franklin Elementary School - Interior	001	112	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	42	1080	2080	2246.4	$426.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2080	2080	1272.96	1272.96	None Proposed	0	0.468	973.44	185.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Franklin Elementary School - Interior	001	117	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	43	1080	2080	2246.4	$426.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2080	2080	1272.96	1272.96	None Proposed	0	0.468	973.44	185.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Franklin Elementary School - Interior	001	113	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9		1080	2080	2246.4	$426.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	2080	2080	1272.96	1272.96	None Proposed	0	0.468	973.44	185.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Franklin Elementary School - Interior	001	116	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	55	1080	500	540	$102.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	500	350	306	214.2	None Proposed	1	0.468	325.8	61.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Franklin Elementary School - Interior	001	114	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	49	1080	500	540	$102.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	500	350	306	214.2	None Proposed	1	0.468	325.8	61.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Franklin Elementary School - Interior	001	115	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	56	1080	500	540	$102.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	500	350	306	214.2	None Proposed	1	0.468	325.8	61.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Franklin Elementary School - Interior	001	105 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	3	35	2600	91	$17.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	10.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Franklin Elementary School - Interior	001	104 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	4	35	2600	91	$17.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	2600	1820	52	36.4	None Proposed	1	0.015	54.6	10.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Franklin Elementary School - Interior	001	103 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	4	35	3120	109.2	$20.7	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	3120	2184	62.4	43.68	None Proposed	1	0.015	65.52	12.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Franklin Elementary School - Interior	001	102 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		35	3120	109.2	$20.7	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	3120	2184	62.4	43.68	None Proposed	1	0.015	65.52	12.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Franklin Elementary School - Interior	001	101 C	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	11	60	3120	187.2	$35.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3120	2184	106.08	74.256	None Proposed	1	0.026	112.944	21.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Franklin Elementary School - Interior	001	Women's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	31	180	3120	561.6	$106.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3120	2184	318.24	222.768	None Proposed	1	0.078	338.832	64.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Franklin Elementary School - Interior	001	Women's	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		35	3120	109.2	$20.7	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	1	20	3120	2184	62.4	43.68	None Proposed	1	0.015	65.52	12.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Franklin Elementary School - Interior	001	Men's	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		70	3120	218.4	$41.5	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	2	40	3120	2184	124.8	87.36	None Proposed	1	0.03	131.04	24.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Franklin Elementary School - Interior	001	Men's	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	17	120	3120	374.4	$71.1	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	3120	2184	212.16	148.512	None Proposed	1	0.052	225.888	42.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Franklin Elementary School - Interior	001	Ladies	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	16	120	8760	1051.2	$199.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	8760	8760	595.68	595.68	None Proposed	0	0.052	455.52	86.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Franklin Elementary School - Interior	001	Ladies	13W CFL Fixture	1	19	13	8760	113.88	$21.6	None Proposed	1	13	8760	8760	113.88	113.88	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Franklin Elementary School - Interior	001	Stair	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	30	420	8760	3679.2	$699.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	8760	8760	2084.88	2084.88	None Proposed	0	0.182	1594.32	302.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$70
Franklin Elementary School - Interior	001	111 Bath	26W CFL Fixture	1		26	8760	227.76	$43.3	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Franklin Elementary School - Interior	001	118 Bath	26W CFL Fixture	1	8	26	8760	227.76	$43.3	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Franklin Elementary School - Interior	001	112 Bath	26W CFL Fixture	1	7	26	8760	227.76	$43.3	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Franklin Elementary School - Interior	001	117 Bath	26W CFL Fixture	1	10	26	8760	227.76	$43.3	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Franklin Elementary School - Interior	001	113 Bath	26W CFL Fixture	1	9	26	8760	227.76	$43.3	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Franklin Elementary School - Interior	001	116 Bath	26W CFL Fixture	1	6	26	8760	227.76	$43.3	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Franklin Elementary School - Interior	001	114 Bath	26W CFL Fixture	1	12	26	8760	227.76	$43.3	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Franklin Elementary School - Interior	001	115 Bath	26W CFL Fixture	1	5	26	8760	227.76	$43.3	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Franklin Elementary School - Interior	001	Stair	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	20	480	8760	4204.8	$798.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	8	272	8760	8760	2382.72	2382.72	None Proposed	0	0.208	1822.08	346.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Franklin Elementary School - Interior	002	214	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	55	1080	2600	2808	$533.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	321.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Franklin Elementary School - Interior	002	215	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	49	1080	8760	9460.8	$1,797.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	778.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Franklin Elementary School - Interior	002	213	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	36	1080	500	540	$102.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	500	350	306	214.2	None Proposed	1	0.468	325.8	61.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Franklin Elementary School - Interior	002	212	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12		1080	500	540	$102.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	500	500	306	306	None Proposed	0	0.468	234	44.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Franklin Elementary School - Interior	002	216	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	40	1080	500	540	$102.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	500	500	306	306	None Proposed	0	0.468	234	44.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Franklin Elementary School - Interior	002	217	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	50	1080	500	540	$102.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	500	500	306	306	None Proposed	0	0.468	234	44.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Franklin Elementary School - Interior	002	218	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12		1080	8760	9460.8	$1,797.6	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	12	612	8760	8760	5361.12	5361.12	None Proposed	0	0.468	4099.68	778.9	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$780.0	$2,088.0	$2,868.0	$93.6	$180
Franklin Elementary School - Interior	002	211 B	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8		720	500	360	$68.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	8	408	500	350	204	142.8	None Proposed	1	0.312	217.2	41.3	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$520.0	$1,392.0	$1,912.0	$62.4	$120
Franklin Elementary School - Interior	002	211 A	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8		720	500	360	$68.4	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	8	408	500	350	204	142.8	None Proposed	1	0.312	217.2	41.3	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$520.0	$1,392.0	$1,912.0	$62.4	$120
Franklin Elementary School - Interior	002	201	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	38	480	500	240	$45.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	500	350	127.5	89.25	None Proposed	1	0.225	150.75	28.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Franklin Elementary School - Interior	002	202	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	68	1080	500	540	$102.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	9	612	500	350	306	214.2	None Proposed	1	0.468	325.8	61.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$585.0	$2,016.0	$2,601.0	$93.6	$180
Franklin Elementary School - Interior	002	204	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	28	480	3120	1497.6	$284.5	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	3120	2184	795.6	556.92	None Proposed	1	0.225	940.68	178.7	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Franklin Elementary School - Interior	002	203	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	30	480	500	240	$45.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	500	350	127.5	89.25	None Proposed	1	0.225	150.75	28.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Franklin Elementary School - Interior	002	205	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15		480	2600	1248	$237.1	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	148.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Franklin Elementary School - Interior	002	206	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	32	480	2600	1248	$237.1	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	148.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Franklin Elementary School - Interior	002	208	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	39	480	2600	1248	$237.1	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	148.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Franklin Elementary School - Interior	002	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	28	240	2600	624	$118.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	71.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Franklin Elementary School - Interior	002	Boy's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	32	240	2600	624	$118.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	71.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Franklin Elementary School - Interior	002	Girl's	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	31	240	2600	624	$118.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	71.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Franklin Elementary School - Interior	002	Staff	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	40	60	2600	156	$29.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	17.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Franklin Elementary School - Interior	002	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	36	1440	2600	3744	$711.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	429.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$240
Franklin Elementary School - Interior	002	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	70	1080	2600	2808	$533.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	2600	1820	1591.2	1113.84	None Proposed	1	0.468	1694.16	321.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Franklin Elementary School - Interior	002	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	4	180	2600	468	$88.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	2600	1820	265.2	185.64	None Proposed	1	0.078	282.36	53.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Franklin Elementary School - Interior	002	Women's	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	30	720	2600	1872	$355.7	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	8	408	2600	1820	1060.8	742.56	None Proposed	1	0.312	1129.44	214.6	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$520.0	$1,392.0	$1,912.0	$62.4	$120
Franklin Elementary School - Interior	002	201 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	4	280	2600	728	$138.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	8	160	2600	1820	416	291.2	None Proposed	1	0.12	436.8	83.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Franklin Elementary School - Interior	002	202 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	8	280	2600	728	$138.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	8	160	2600	1820	416	291.2	None Proposed	1	0.12	436.8	83.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Franklin Elementary School - Interior	002	204 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	5	280	2600	728	$138.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	8	160	2600	1820	416	291.2	None Proposed	1	0.12	436.8	83.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Franklin Elementary School - Interior	002	203 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8		280	2600	728	$138.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	8	160	2600	1820	416	291.2	None Proposed	1	0.12	436.8	83.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Franklin Elementary School - Interior	002	205 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8		280	2600	728	$138.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	8	160	2600	1820	416	291.2	None Proposed	1	0.12	436.8	83.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Franklin Elementary School - Interior	002	206 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	8	280	2600	728	$138.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	8	160	2600	1820	416	291.2	None Proposed	1	0.12	436.8	83.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Franklin Elementary School - Interior	002	208 C	1X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	5	280	2600	728	$138.3	Remove Ballast, Install 2-10W LED Tube Retrofit Bulbs	8	160	2600	1820	416	291.2	None Proposed	1	0.12	436.8	83.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$520.0	$992.0	$1,512.0	$41.6	$80
Franklin Elementary School - Interior	002	Vazquez	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	2600	312	$59.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	35.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$20
Franklin Elementary School - Interior	002	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	6	240	500	120	$22.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	350	68	47.6	None Proposed	1	0.104	72.4	13.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Franklin Elementary School - Interior	002	Boy's	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	33	732	8760	6412.32	$1,218.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	8760	8760	3574.08	3574.08	None Proposed	0	0.324	2838.24	539.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$120
Franklin Elementary School - Interior	002	Balcony	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	15	610	8760	5343.6	$1,015.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	10	340	8760	8760	2978.4	2978.4	None Proposed	0	0.27	2365.2	449.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$650.0	$1,240.0	$1,890.0	$52.0	$100
Washington Elementary School - Interior	001	Main Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	60	480	500	240	$45.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	4	272	500	350	136	95.2	None Proposed	1	0.208	144.8	27.5	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
Washington Elementary School - Interior	001	Boys	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1		120	500	60	$11.4	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	500	500	34	34	None Proposed	2	0.052	26	4.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Washington Elementary School - Interior	001	Boys	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	61	50.7	500	25.35	$4.8	Replace 32W T8 Lamps with 25W T8 Lamps	1	39.7	500	500	19.85	19.85	None Proposed	3	0.011	5.5	1.0	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$8.0	$5.0	$13.0	$0.0	$0
Washington Elementary School - Interior	001	Girls	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	90	120	500	60	$11.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	500	34	34	None Proposed	4	0.052	26	4.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Washington Elementary School - Interior	001	Girls	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1		120	500	60	$11.4	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	500	500	34	34	None Proposed	5	0.052	26	4.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Washington Elementary School - Interior	001	Jan	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	57	60	500	30	$5.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	500	17	17	None Proposed	6	0.026	13	2.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Washington Elementary School - Interior	001	Boiler Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6		360	500	180	$34.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	500	500	102	102	None Proposed	7	0.156	78	14.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Washington Elementary School - Interior	001	Boiler Room	26W CFL Fixture	1		26	500	13	$2.5	None Proposed	1	26	500	500	13	13	None Proposed	8	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Washington Elementary School - Interior	001	3R	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	70	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	9	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	3R BATH	100W Incandescent Fixture	1	18	100	500	50	$9.5	Replace 100W Incandescent Fixture with 25W CFL	1	25	500	500	12.5	12.5	None Proposed	10	0.075	37.5	7.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$3.6	$0
Washington Elementary School - Interior	001	1B	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	60	1344	500	672	$127.7	Replace 32W T8 Lamps with 25W T8 Lamps	12	950.4	500	500	475.2	475.2	None Proposed	11	0.3936	196.8	37.4	$0.0	$10.0	$16.0	$0.0	$0.0	$16.0	$10.0	$26.0	$192.0	$120.0	$312.0	$0.0	$0
Washington Elementary School - Interior	001	1M	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	53	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	12	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	20	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	55	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	13	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	5	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	50	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	14	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	2L	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	65	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	15	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	2H	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	51	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	16	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	1G	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	58	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	17	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Washington Elementary School - Interior	001	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		50.7	500	25.35	$4.8	Replace 32W T8 Lamps with 25W T8 Lamps	1	39.7	500	500	19.85	19.85	None Proposed	18	0.011	5.5	1.0	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$8.0	$5.0	$13.0	$0.0	$0
Washington Elementary School - Interior	001	Hall	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	13	24	1170	500	585	$111.2	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	13	663	500	500	331.5	331.5	None Proposed	19	0.507	253.5	48.2	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$845.0	$2,262.0	$3,107.0	$101.4	$195
Washington Elementary School - Interior	001	Mens	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1		32	500	16	$3.0	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	1	17	500	500	8.5	8.5	None Proposed	20	0.015	7.5	1.4	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$65.0	$74.0	$139.0	$2.6	$5
Washington Elementary School - Interior	001	1M Bath	100W Incandescent Fixture	1	23	100	500	50	$9.5	Replace 100W Incandescent Fixture with 25W CFL	1	25	500	500	12.5	12.5	None Proposed	21	0.075	37.5	7.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Washington Elementary School - Interior	001	5 Bath	100W Incandescent Fixture	1	9	100	500	50	$9.5	Replace 100W Incandescent Fixture with 25W CFL	1	25	500	500	12.5	12.5	None Proposed	22	0.075	37.5	7.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Washington Elementary School - Interior	001	2C	100W Incandescent Fixture	1	8	100	500	50	$9.5	Replace 100W Incandescent Fixture with 25W CFL	1	25	500	500	12.5	12.5	None Proposed	23	0.075	37.5	7.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Washington Elementary School - Interior	001	2H	65W Incandescent Fixture	1	5	65	500	32.5	$6.2	Replace 65W Incandescent Fixture with 13W CFL	1	13	500	500	6.5	6.5	None Proposed	24	0.052	26	4.9	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
Washington Elementary School - Interior	001	1G	100W Incandescent Fixture	1	10	100	500	50	$9.5	Replace 100W Incandescent Fixture with 25W CFL	1	25	500	500	12.5	12.5	None Proposed	25	0.075	37.5	7.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Washington Elementary School - Interior	001	Teacher	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	58	480	500	240	$45.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	4	272	500	500	136	136	None Proposed	26	0.208	104	19.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
Washington Elementary School - Interior	001	Teacher bath	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	27	60	500	30	$5.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	500	17	17	None Proposed	27	0.026	13	2.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Washington Elementary School - Interior	001	Media k1	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	38	480	500	240	$45.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	4	272	500	500	136	136	None Proposed	28	0.208	104	19.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
Washington Elementary School - Interior	001	k1 Bath	100W Incandescent Fixture	1	6	100	500	50	$9.5	Replace 100W Incandescent Fixture with 25W CFL	1	25	500	500	12.5	12.5	None Proposed	29	0.075	37.5	7.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Washington Elementary School - Interior	001	k1 vest	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	15	60	500	30	$5.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	500	17	17	None Proposed	30	0.026	13	2.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Washington Elementary School - Interior	001	Resource	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	66	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	31	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	Resource bath	100W Incandescent Fixture	1	5	100	500	50	$9.5	Replace 100W Incandescent Fixture with 25W CFL	1	25	500	500	12.5	12.5	None Proposed	32	0.075	37.5	7.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Washington Elementary School - Interior	001	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9		540	500	270	$51.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	9	306	500	500	153	153	None Proposed	33	0.234	117	22.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$585.0	$1,116.0	$1,701.0	$46.8	$90
Washington Elementary School - Interior	001	Resource 2	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	61	240	500	120	$22.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	500	68	68	None Proposed	34	0.104	52	9.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Washington Elementary School - Interior	001	Stage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	13	360	500	180	$34.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	500	500	102	102	None Proposed	35	0.156	78	14.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$60
Washington Elementary School - Interior	001	Stage	65W Incandescent Fixture	6		390	500	195	$37.1	Replace 65W Incandescent Fixture with 13W CFL	6	78	500	500	39	39	None Proposed	36	0.312	156	29.6	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$24.0	$37.5	$61.5	$128.0	$0
Washington Elementary School - Interior	001	Girls	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	46	240	500	120	$22.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	500	68	68	None Proposed	37	0.104	52	9.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Washington Elementary School - Interior	001	Boys	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	29	240	500	120	$22.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	500	68	68	None Proposed	38	0.104	52	9.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Washington Elementary School - Interior	001	3B 10	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	57	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	39	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	5U 11	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	53	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	40	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	4R 12	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	48	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	41	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	14	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	60	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	42	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	5C 16	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	48	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	43	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	13	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12		1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	44	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	5A	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	61	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	45	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	36 9	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	63	1440	500	720	$136.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	500	500	408	408	None Proposed	46	0.624	312	59.3	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Washington Elementary School - Interior	001	Hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	60	420	500	210	$39.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	500	500	119	119	None Proposed	47	0.182	91	17.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$70
Washington Elementary School - Interior	001	Hall	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4		244	500	122	$23.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	500	68	68	None Proposed	48	0.108	54	10.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Washington Elementary School - Interior	001	Hall	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	5		600	500	300	$57.0	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	5	340	500	500	170	170	None Proposed	49	0.26	130	24.7	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$325.0	$1,120.0	$1,445.0	$52.0	$100
Washington Elementary School - Interior	001	Hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	8	120	500	60	$11.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	500	500	34	34	None Proposed	50	0.052	26	4.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Washington Elementary School - Interior	001	Gym	2X4 Fixtures w/ 6-T8 Lamps w/ Electronic Ballasts	10	59	1760	500	880	$167.2	Remove Ballast, Install 6-17W LED Tube Retrofit Bulbs	10	1010	500	500	505	505	None Proposed	51	0.75	375	71.3	$48.0	$300.0	$65.0	$0.0	$0.0	$65.0	$348.0	$413.0	$650.0	$3,480.0	$4,130.0	$156.0	$300
Roosevelt Intermediate School - Interior	003	302	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	92	1440	3120	4492.8	$808.7	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	3120	2184	2545.92	1782.144	None Proposed	1	0.624	2710.656	487.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Roosevelt Intermediate School - Interior	003	300	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	12	51	384	500	192	$34.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	12	204	500	500	102	102	None Proposed	0	0.18	90	16.2	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$780.0	$888.0	$1,668.0	$31.2	$60
Roosevelt Intermediate School - Interior	003	300 Bath	26W CFL Fixture	1	10	26	8760	227.76	$41.0	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	003	300 Hall Closet	26W CFL Fixture	1	2	26	500	13	$2.3	None Proposed	1	26	500	350	13	9.1	None Proposed	1	0	3.9	0.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	003	304	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	20	34	640	500	320	$57.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	20	340	500	350	170	119	None Proposed	1	0.3	201	36.2	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,300.0	$1,480.0	$2,780.0	$52.0	$100
Roosevelt Intermediate School - Interior	003	303	100W Incandescent Fixture	1	3	100	500	50	$9.0	Replace 100W Incandescent Fixture with 25W CFL	1	25	500	350	12.5	8.75	None Proposed	1	0.075	41.25	7.4	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	003	305	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	20	50	640	2600	1664	$299.5	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	1	17	2600	1820	44.2	30.94	None Proposed	1	0.623	1633.06	294.0	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$65.0	$74.0	$139.0	$2.6	$5
Roosevelt Intermediate School - Interior	003	306	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	20	35	640	2600	1664	$299.5	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	20	340	2600	1820	884	618.8	None Proposed	1	0.3	1045.2	188.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,300.0	$1,480.0	$2,780.0	$52.0	$100
Roosevelt Intermediate School - Interior	003	307	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	31	480	2600	1248	$224.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	20	340	2600	1820	884	618.8	None Proposed	1	0.14	629.2	113.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,300.0	$1,480.0	$2,780.0	$52.0	$100
Roosevelt Intermediate School - Interior	003	308	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	34	480	2600	1248	$224.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	141.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Roosevelt Intermediate School - Interior	003	3 womens	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	4		128	2600	332.8	$59.9	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	4	68	2600	1820	176.8	123.76	None Proposed	1	0.06	209.04	37.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$260.0	$296.0	$556.0	$10.4	$20
Roosevelt Intermediate School - Interior	003	3 womens	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	32	120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Roosevelt Intermediate School - Interior	003	Jan closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Roosevelt Intermediate School - Interior	003	310	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	80	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Roosevelt Intermediate School - Interior	003	311	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	10		320	2600	832	$149.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	10	170	2600	1820	442	309.4	None Proposed	1	0.15	522.6	94.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$650.0	$740.0	$1,390.0	$26.0	$50
Roosevelt Intermediate School - Interior	003	312	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	10	40	320	2600	832	$149.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	10	170	2600	1820	442	309.4	None Proposed	1	0.15	522.6	94.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$650.0	$740.0	$1,390.0	$26.0	$50
Roosevelt Intermediate School - Interior	003	313	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	62	480	2600	1248	$224.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	10	680	2600	1820	1768	1237.6	None Proposed	1	-0.2	10.4	1.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$650.0	$2,240.0	$2,890.0	$104.0	$200
Roosevelt Intermediate School - Interior	003	314	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	84	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	4	272	2600	1820	707.2	495.04	None Proposed	1	1.168	3248.96	584.8	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
Roosevelt Intermediate School - Interior	003	315	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	41	120	2600	312	$56.2	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	-0.696	-1173.12	-211.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Roosevelt Intermediate School - Interior	003	3 boys	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	28	180	2600	468	$84.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.146	406.12	73.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Roosevelt Intermediate School - Interior	003	3 boys	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2		50.8	2600	132.08	$23.8	Replace 32W T8 Lamps with 25W T8 Lamps	3	59.4	2600	1820	154.44	108.108	None Proposed	1	-0.0086	23.972	4.3	$0.0	$2.5	$4.0	$0.0	$0.0	$4.0	$2.5	$6.5	$12.0	$7.5	$19.5	$0.0	$0

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Roosevelt Intermediate School - Interior	003	Jan Closet	1X4 Suspended Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	40	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Roosevelt Intermediate School - Interior	003	316	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	55	1440	1560	2246.4	$404.4	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	1560	1560	1272.96	1272.96	None Proposed	0	0.624	973.44	175.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Roosevelt Intermediate School - Interior	003	318	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	82	1440	1560	2246.4	$404.4	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	1560	1560	1272.96	1272.96	None Proposed	0	0.624	973.44	175.2	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Roosevelt Intermediate School - Interior	003	319	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	92	1440	2600	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Roosevelt Intermediate School - Interior	003	320	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	40	480	500	240	$43.2	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	12	204	500	350	102	71.4	None Proposed	1	0.276	168.6	30.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$780.0	$888.0	$1,668.0	$31.2	$60
Roosevelt Intermediate School - Interior	003	321	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	65	1440	8760	12614.4	$2,270.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	12	816	8760	8760	7148.16	7148.16	None Proposed	0	0.624	5466.24	983.9	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$780.0	$2,688.0	$3,468.0	$124.8	$240
Roosevelt Intermediate School - Interior	003	322	100W Incandescent Fixture	1	4	100	8760	876	$157.7	Replace 100W Incandescent Fixture with 25W CFL	1	25	8760	8760	219	219	None Proposed	0	0.075	657	118.3	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	003	323	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	31	480	8760	4204.8	$756.9	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	8760	8760	2233.8	2233.8	None Proposed	0	0.225	1971	354.8	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Roosevelt Intermediate School - Interior	003	324	26W CFL Fixture	1		26	8760	227.76	$41.0	None Proposed	1	26	8760	8760	227.76	227.76	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	003	325	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	11	47	352	8760	3083.52	$555.0	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	11	187	8760	8760	1638.12	1638.12	None Proposed	0	0.165	1445.4	260.2	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$715.0	$814.0	$1,529.0	$28.6	$55
Roosevelt Intermediate School - Interior	003	325 batrh	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	24	50.7	8760	444.132	$79.9	Replace 32W T8 Lamps with 25W T8 Lamps	11	436.7	8760	8760	3825.492	3825.492	None Proposed	0	-0.386	-3381.36	-608.6	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$88.0	$55.0	$143.0	$0.0	$0
Roosevelt Intermediate School - Interior	003	300 hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	39		1977.3	1560	3084.588	$555.2	Replace 32W T8 Lamps with 25W T8 Lamps	39	1548.3	1560	1560	2415.348	2415.348	None Proposed	0	0.429	669.24	120.5	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$312.0	$195.0	$507.0	$0.0	$0
Roosevelt Intermediate School - Interior	002	223	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	13	34	416	1560	648.96	$116.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	13	221	1560	1560	344.76	344.76	None Proposed	0	0.195	304.2	54.8	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$845.0	$962.0	$1,807.0	$33.8	$65
Roosevelt Intermediate School - Interior	002	225	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	17	85	1020	1560	1591.2	$286.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	17	578	1560	1560	901.68	901.68	None Proposed	0	0.442	689.52	124.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,105.0	$2,108.0	$3,213.0	$88.4	$255
Roosevelt Intermediate School - Interior	002	Elec	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	17	35	1020	1560	1591.2	$286.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	17	578	1560	1560	901.68	901.68	None Proposed	0	0.442	689.52	124.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,105.0	$2,108.0	$3,213.0	$88.4	$255
Roosevelt Intermediate School - Interior	002	221	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	35	381	3640	1386.84	$249.6	Replace 32W T8 Lamps with 25W T8 Lamps	15	297	3640	2548	1081.08	756.756	None Proposed	1	0.084	630.084	113.4	$0.0	$2.5	$4.0	$0.0	$0.0	$4.0	$2.5	$6.5	$60.0	$37.5	$97.5	$0.0	$0
Roosevelt Intermediate School - Interior	002	220	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	35	381	500	190.5	$34.3	Replace 32W T8 Lamps with 25W T8 Lamps	15	297	500	350	148.5	103.95	None Proposed	1	0.084	86.55	15.6	$0.0	$2.5	$4.0	$0.0	$0.0	$4.0	$2.5	$6.5	$60.0	$37.5	$97.5	$0.0	$0
Roosevelt Intermediate School - Interior	002	219	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	85	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	39.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Roosevelt Intermediate School - Interior	002	218	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	10	51	1200	3120	3744	$673.9	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	10	680	3120	3120	2121.6	2121.6	None Proposed	0	0.52	1622.4	292.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$650.0	$2,240.0	$2,890.0	$104.0	$200
Roosevelt Intermediate School - Interior	002	216	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	38	480	500	240	$43.2	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	10	170	500	350	85	59.5	None Proposed	1	0.31	180.5	32.5	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$650.0	$740.0	$1,390.0	$26.0	$50
Roosevelt Intermediate School - Interior	002	2 Boys	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	32	180	500	90	$16.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	500	350	51	35.7	None Proposed	1	0.078	54.3	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$45
Roosevelt Intermediate School - Interior	002	2 Boys	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2		64	500	32	$5.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	2	34	500	350	17	11.9	None Proposed	1	0.03	20.1	3.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$130.0	$148.0	$278.0	$5.2	$10
Roosevelt Intermediate School - Interior	002	Jan	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	52	60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Roosevelt Intermediate School - Interior	002	214	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	22	69	1320	500	660	$118.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	22	748	500	350	374	261.8	None Proposed	1	0.572	398.2	71.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,430.0	$2,728.0	$4,158.0	$114.4	$330
Roosevelt Intermediate School - Interior	002	214 Closet	100W Incandescent Fixture	1	14	100	2600	260	$46.8	Replace 100W Incandescent Fixture with 25W CFL	1	25	2600	1820	65	45.5	None Proposed	1	0.075	214.5	38.6	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	002	210	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	72	1200	2600	3120	$561.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	20	680	2600	1820	1768	1237.6	None Proposed	1	0.52	1882.4	338.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,300.0	$2,480.0	$3,780.0	$104.0	$300
Roosevelt Intermediate School - Interior	002	210 Closet	100W Incandescent Fixture	1	14	100	2600	260	$46.8	Replace 100W Incandescent Fixture with 25W CFL	1	25	2600	1820	65	45.5	None Proposed	1	0.075	214.5	38.6	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	002	2 Girls	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	1820	176.8	123.76	None Proposed	1	0.052	188.24	33.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Roosevelt Intermediate School - Interior	002	2 Girls	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	4		128	500	64	$11.5	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	4	68	500	350	34	23.8	None Proposed	1	0.06	40.2	7.2	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$260.0	$296.0	$556.0	$10.4	$20
Roosevelt Intermediate School - Interior	002	Janitor	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50	60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Roosevelt Intermediate School - Interior	002	208	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	34	480	2600	1248	$224.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	141.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Roosevelt Intermediate School - Interior	002	207	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15		480	2600	1248	$224.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	141.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Roosevelt Intermediate School - Interior	002	206	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	28	480	2600	1248	$224.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	141.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Roosevelt Intermediate School - Interior	002	205	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	28	480	2600	1248	$224.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	141.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Roosevelt Intermediate School - Interior	002	204	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	29	480	2600	1248	$224.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	15	255	2600	1820	663	464.1	None Proposed	1	0.225	783.9	141.1	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$975.0	$1,110.0	$2,085.0	$39.0	$75
Roosevelt Intermediate School - Interior	002	203	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	2600	156	$28.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.026	94.12	16.9	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Roosevelt Intermediate School - Interior	002	202	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	28	50	896	500	448	$80.6	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	28	476	500	350	238	166.6	None Proposed	1	0.42	281.4	50.7	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,820.0	$2,072.0	$3,892.0	$72.8	$140
Roosevelt Intermediate School - Interior	002	200	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	16	72	512	500	256	$46.1	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	16	272	500	350	136	95.2	None Proposed	1	0.24	160.8	28.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,040.0	$1,184.0	$2,224.0	$41.6	$80
Roosevelt Intermediate School - Interior	002	200 office	1x4 Fixtures w/ 3-T12 Lamp Fixture w/ Magnetic Ballast	1	45	128.4	500	64.2	$11.6	Replace T12 Bulbs With 32W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	88	500	350	44	30.8	None Proposed	1	0.0404	33.4	6.0	$85.0	$15.0	$65.0	$0.0	$0.0	$65.0	$100.0	$165.0	$65.0	$100.0	$165.0	$7.5	$0
Roosevelt Intermediate School - Interior	002	closet	PL4 CFL Fixture	1	9	26	8760	227.76	$41.0	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	1	16	8760	8760	140.16	140.16	None Proposed	0	0.01	87.6	15.8	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$10.0	$130.0	$140.0	$6.0	$0
Roosevelt Intermediate School - Interior	002	closet	150W Incandescent Fixture	1		150	8760	1314	$236.5	Replace 150W Incandescent Fixture with 25W CFL	1	25	8760	8760	219	219	None Proposed	0	0.125	1095	197.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	002	2 Server	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	4	48	101.6	500	50.8	$9.1	Replace 32W T8 Lamps with 25W T8 Lamps	4	79.2	500	350	39.6	27.72	None Proposed	1	0.0224	23.08	4.2	$0.0	$2.5	$4.0	$0.0	$0.0	$4.0	$2.5	$6.5	$16.0	$10.0	$26.0	$0.0	$0
Roosevelt Intermediate School - Interior	002	2 hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	42	23	2129.4	3120	6643.728	$1,195.9	Replace 32W T8 Lamps with 25W T8 Lamps	42	1667.4	3120	2184	5202.288	3641.6016	None Proposed	1	0.462	3002.1264	540.4	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$336.0	$210.0	$546.0	$0.0	$0
Roosevelt Intermediate School - Interior	002	2 supply	150W Incandescent Fixture	2	46	300	3120	936	$168.5	Replace 150W Incandescent Fixture with 25W CFL	2	50	3120	2184	156	109.2	None Proposed	1	0.25	826.8	148.8	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$8.0	$14.0	$22.0	$67.2	$0
Roosevelt Intermediate School - Interior	002	2 sci hall	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	26	660	500	330	$59.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	11	374	500	350	187	130.9	None Proposed	1	0.286	199.1	35.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$715.0	$1,364.0	$2,079.0	$57.2	$165
Roosevelt Intermediate School - Interior	002	250	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	4	24	128	2600	332.8	$59.9	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	4	68	2600	1820	176.8	123.76	None Proposed	1	0.06	209.04	37.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$260.0	$296.0	$556.0	$10.4	$20
Roosevelt Intermediate School - Interior	002	515	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	27	57	1620	2600	4212	$758.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	27	918	2600	1820	2386.8	1670.76	None Proposed	1	0.702	2541.24	457.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,755.0	$3,348.0	$5,103.0	$140.4	$405
Roosevelt Intermediate School - Interior	002	501	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	85	1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Roosevelt Intermediate School - Interior	002	502	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	75	1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Roosevelt Intermediate School - Interior	002	503	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24		1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Roosevelt Intermediate School - Interior	002	503p	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	55	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	1820	353.6	247.52	None Proposed	1	0.104	376.48	67.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Roosevelt Intermediate School - Interior	002	506	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	71	1440	2600	3744	$673.9	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2600	1820	2121.6	1485.12	None Proposed	1	0.624	2258.88	406.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Roosevelt Intermediate School - Interior	002	5 Elec	100W Incandescent Fixture	1	7	100	2600	260	$46.8	Replace 100W Incandescent Fixture with 25W CFL	1	25	2600	1820	65	45.5	None Proposed	1	0.075	214.5	38.6	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	002	5 girls	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	36	112	2600	291.2	$52.4	Replace 32W T8 Lamps with 25W T8 Lamps	1	79.2	2600	1820	205.92	144.144	None Proposed	1	0.0328	147.056	26.5	$0.0	$10.0	$16.0	$0.0	$0.0	$16.0	$10.0	$26.0	$16.0	$10.0	$26.0	$0.0	$0
Roosevelt Intermediate School - Interior	002	5 boys	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	67	224	500	112	$20.2	Replace 32W T8 Lamps with 25W T8 Lamps	2	158.4	500	350	79.2	55.44	None Proposed	1	0.0656	56.56	10.2	$0.0	$10.0	$16.0	$0.0	$0.0	$16.0	$10.0	$26.0	$32.0	$20.0	$52.0	$0.0	$0

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Roosevelt Intermediate School - Interior	002	Staff bath	150W Incandescent Fixture	2	21	300	500	150	$27.0	Replace 150W Incandescent Fixture with 25W CFL	2	50	500	350	25	17.5	None Proposed	1	0.25	132.5	23.9	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$8.0	$14.0	$22.0	$67.2	$0
Roosevelt Intermediate School - Interior	002	Staff bath	150W Incandescent Fixture	2		300	500	150	$27.0	Replace 150W Incandescent Fixture with 25W CFL	2	50	500	350	25	17.5	None Proposed	1	0.25	132.5	23.9	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$8.0	$14.0	$22.0	$67.2	$0
Roosevelt Intermediate School - Interior	002	Faculty café	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	63	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	350	204	142.8	None Proposed	1	0.312	217.2	39.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180
Roosevelt Intermediate School - Interior	002	Fan room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	21	420	500	210	$37.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	500	500	119	119	None Proposed	0	0.182	91	16.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$105
Roosevelt Intermediate School - Interior	002	archive room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	36	120	500	60	$10.8	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	500	500	34	34	None Proposed	0	0.052	26	4.7	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Roosevelt Intermediate School - Interior	002	SCI Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	22		1320	2080	2745.6	$494.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	22	748	2080	1456	1555.84	1089.088	None Proposed	1	0.572	1656.512	298.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,430.0	$2,728.0	$4,158.0	$114.4	$330
Roosevelt Intermediate School - Interior	001	Sci stair	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	17		1020	3120	3182.4	$572.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	17	578	3120	2184	1803.36	1262.352	None Proposed	1	0.442	1920.048	345.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,105.0	$2,108.0	$3,213.0	$88.4	$255
Roosevelt Intermediate School - Interior	001	Sci stair	PL4 CFL Fixture	1		26	500	13	$2.3	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	1	16	500	500	8	8	None Proposed	0	0.01	5	0.9	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$10.0	$130.0	$140.0	$6.0	$0
Roosevelt Intermediate School - Interior	001	café	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	64	63	3840	500	1920	$345.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	64	2176	500	350	1088	761.6	None Proposed	1	1.664	1158.4	208.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$4,160.0	$7,936.0	$12,096.0	$332.8	$960
Roosevelt Intermediate School - Interior	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	45	1440	2080	2995.2	$539.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	24	816	2080	1456	1697.28	1188.096	None Proposed	1	0.624	1807.104	325.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,560.0	$2,976.0	$4,536.0	$124.8	$360
Roosevelt Intermediate School - Interior	001	café locker	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	14	60	3640	218.4	$39.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	3640	3640	123.76	123.76	None Proposed	0	0.026	94.64	17.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Roosevelt Intermediate School - Interior	001	Bathroom	150W Incandescent Fixture	1	7	150	3640	546	$98.3	Replace 150W Incandescent Fixture with 25W CFL	1	25	3640	3640	91	91	None Proposed	0	0.125	455	81.9	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	001	food storage	150W Incandescent Fixture	1	23	150	3640	546	$98.3	Replace 150W Incandescent Fixture with 25W CFL	1	25	3640	3640	91	91	None Proposed	0	0.125	455	81.9	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	001	hood	65W Incandescent Fixture	1		65	8760	569.4	$102.5	Replace 65W Incandescent Fixture with 13W CFL	1	13	8760	8760	113.88	113.88	None Proposed	0	0.052	455.52	82.0	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
Roosevelt Intermediate School - Interior	001	Storage	150W Incandescent Fixture	1	14	150	8760	1314	$236.5	Replace 150W Incandescent Fixture with 25W CFL	1	25	8760	8760	219	219	None Proposed	0	0.125	1095	197.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	001	loading	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	33	240	8760	2102.4	$378.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.104	911.04	164.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Roosevelt Intermediate School - Interior	001	Elec service	150W Incandescent Fixture	1		150	8760	1314	$236.5	Replace 150W Incandescent Fixture with 25W CFL	1	25	8760	8760	219	219	None Proposed	0	0.125	1095	197.1	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	001	staff lunch	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	62	360	8760	3153.6	$567.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	8760	8760	1787.04	1787.04	None Proposed	0	0.156	1366.56	246.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Roosevelt Intermediate School - Interior	001	meeting	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	24		768	8760	6727.68	$1,211.0	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	24	408	8760	8760	3574.08	3574.08	None Proposed	0	0.36	3153.6	567.6	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,560.0	$1,776.0	$3,336.0	$62.4	$120
Roosevelt Intermediate School - Interior	001	meeting	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4		240	8760	2102.4	$378.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	8760	8760	1191.36	1191.36	None Proposed	0	0.104	911.04	164.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Roosevelt Intermediate School - Interior	001	library	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	80	709.8	3120	2214.576	$398.6	Replace 32W T8 Lamps with 25W T8 Lamps	14	555.8	3120	3120	1734.096	1734.096	None Proposed	0	0.154	480.48	86.5	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$112.0	$70.0	$182.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	library	13W CFL Fixture	19	76	247	500	123.5	$22.2	None Proposed	19	247	500	500	123.5	123.5	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	library	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	77	110	4697	500	2348.5	$422.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	77	2618	500	500	1309	1309	None Proposed	0	2.079	1039.5	187.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$5,005.0	$9,548.0	$14,553.0	$400.4	$770
Roosevelt Intermediate School - Interior	001	library off	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	39	61	2600	158.6	$28.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	2600	88.4	88.4	None Proposed	0	0.027	70.2	12.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Roosevelt Intermediate School - Interior	001	library off	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	16	240	2600	624	$112.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	2600	2600	353.6	353.6	None Proposed	0	0.104	270.4	48.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$40
Roosevelt Intermediate School - Interior	001	library off	1x2 Fixture w/ 2-T12 Lamps w/ Magnetic Ballasts	1	12	46	2600	119.6	$21.5	Replace T12 Bulbs With 17W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	30	2600	2600	78	78	None Proposed	0	0.016	41.6	7.5	$55.0	$10.0	$65.0	$0.0	$0.0	$65.0	$65.0	$130.0	$65.0	$65.0	$130.0	$2.1	$0
Roosevelt Intermediate School - Interior	001	girls	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	65	360	2600	936	$168.5	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	3	204	2600	2600	530.4	530.4	None Proposed	0	0.156	405.6	73.0	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$195.0	$672.0	$867.0	$31.2	$60
Roosevelt Intermediate School - Interior	001	girls	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		60	500	30	$5.4	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	500	350	17	11.9	None Proposed	1	0.026	18.1	3.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Roosevelt Intermediate School - Interior	001	Boys	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3		360	500	180	$32.4	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	3	204	500	350	102	71.4	None Proposed	1	0.156	108.6	19.5	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$195.0	$672.0	$867.0	$31.2	$60
Roosevelt Intermediate School - Interior	001	girls office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	91	240	500	120	$21.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	4	136	500	350	68	47.6	None Proposed	1	0.104	72.4	13.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$260.0	$496.0	$756.0	$20.8	$60
Roosevelt Intermediate School - Interior	001	shower	60W Incandescent Fixture	1		60	500	30	$5.4	Replace 60W Incandescent Fixture with 13W CFL	1	13	500	500	6.5	6.5	None Proposed	0	0.047	23.5	4.2	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
Roosevelt Intermediate School - Interior	001	girls	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3		256.8	500	128.4	$23.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	500	350	51	35.7	None Proposed	1	0.1548	92.7	16.7	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$0
Roosevelt Intermediate School - Interior	001	girls	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	4		684.8	4380	2999.424	$539.9	Replace T12 Bulbs With 32W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	4	448	4380	4380	1962.24	1962.24	None Proposed	0	0.2368	1037.184	186.7	$105.0	$20.0	$65.0	$0.0	$0.0	$65.0	$125.0	$190.0	$260.0	$500.0	$760.0	$38.1	$0
Roosevelt Intermediate School - Interior	001	girls	PL4 CFL Fixture	3		78	2600	202.8	$36.5	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	3	48	2600	1820	124.8	87.36	None Proposed	1	0.03	115.44	20.8	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$30.0	$390.0	$420.0	$18.0	$0
Roosevelt Intermediate School - Interior	001	gym	4' T5 Fixture w/4 T5FO28 Lamps	30		3600	2600	9360	$1,684.8	None Proposed.	30	3600	2600	1820	9360	6552	None Proposed	1	0	2808	505.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	gym hall	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20		1014	2600	2636.4	$474.6	Replace 32W T8 Lamps with 25W T8 Lamps	20	794	2600	1820	2064.4	1445.08	None Proposed	1	0.22	1191.32	214.4	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$160.0	$100.0	$260.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	boys office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	79	253.5	2080	527.28	$94.9	Replace 32W T8 Lamps with 25W T8 Lamps	5	198.5	2080	2080	412.88	412.88	None Proposed	0	0.055	114.4	20.6	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$40.0	$25.0	$65.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	Bath	60W Incandescent Fixture	1		60	2080	124.8	$22.5	Replace 60W Incandescent Fixture with 13W CFL	1	13	2080	2080	27.04	27.04	None Proposed	0	0.047	97.76	17.6	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
Roosevelt Intermediate School - Interior	001	bathlocker	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	8	33	960	2600	2496	$449.3	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	8	544	2600	1820	1414.4	990.08	None Proposed	1	0.416	1505.92	271.1	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$520.0	$1,792.0	$2,312.0	$83.2	$160
Roosevelt Intermediate School - Interior	001	bathlocker	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5		305	2600	793	$142.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	5	170	2600	1820	442	309.4	None Proposed	1	0.135	483.6	87.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$325.0	$620.0	$945.0	$26.0	$50
Roosevelt Intermediate School - Interior	001	bathlocker	150W Incandescent Fixture	3		450	8760	3942	$709.6	Replace 150W Incandescent Fixture with 25W CFL	3	75	8760	8760	657	657	None Proposed	0	0.375	3285	591.3	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$12.0	$21.0	$33.0	$100.8	$0
Roosevelt Intermediate School - Interior	001	bathlocker	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		61	8760	534.36	$96.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.027	236.52	42.6	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Roosevelt Intermediate School - Interior	001	Weight Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	73	480	2600	1248	$224.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	4	272	2600	1820	707.2	495.04	None Proposed	1	0.208	752.96	135.5	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
Roosevelt Intermediate School - Interior	001	Weight Room	2X2 Fixtures w/ 4-17W T8 Lamps w/ Electronic Ballasts	4		252	3640	917.28	$165.1	None Proposed	4	252	3640	2548	917.28	642.096	None Proposed	1	0	275.184	49.5	$0.0	$0.0	$16.0	$0.0	$0.0	$16.0	$0.0	$16.0	$64.0	$0.0	$64.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	vestibale	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1		120	1560	187.2	$33.7	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	1	68	1560	1560	106.08	106.08	None Proposed	0	0.052	81.12	14.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$65.0	$224.0	$289.0	$10.4	$20
Roosevelt Intermediate School - Interior	001	hall	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	38	671	2600	1744.6	$314.0	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	11	374	2600	1820	972.4	680.68	None Proposed	1	0.297	1063.92	191.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$715.0	$1,364.0	$2,079.0	$57.2	$110
Roosevelt Intermediate School - Interior	001	art	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	21	45	1281	3640	4662.84	$839.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	21	714	3640	3640	2598.96	2598.96	None Proposed	0	0.567	2063.88	371.5	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,365.0	$2,604.0	$3,969.0	$109.2	$210
Roosevelt Intermediate School - Interior	001	118 closet	26W CFL Fixture	1		26	3640	94.64	$17.0	None Proposed	1	26	3640	3640	94.64	94.64	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	120	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	28	49	1419.6	3120	4429.152	$797.2	Replace 32W T8 Lamps with 25W T8 Lamps	28	1111.6	3120	2184	3468.192	2427.7344	None Proposed	1	0.308	2001.4176	360.3	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$224.0	$140.0	$364.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	120 office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	45	101.4	500	50.7	$9.1	Replace 32W T8 Lamps with 25W T8 Lamps	2	79.4	500	500	39.7	39.7	None Proposed	0	0.022	11	2.0	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$16.0	$10.0	$26.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	paint	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		101.4	500	50.7	$9.1	Replace 32W T8 Lamps with 25W T8 Lamps	2	79.4	500	350	39.7	27.79	None Proposed	1	0.022	22.91	4.1	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$16.0	$10.0	$26.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	123	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	23	95	1166.1	500	583.05	$104.9	Replace 32W T8 Lamps with 25W T8 Lamps	23	913.1	500	350	456.55	319.585	None Proposed	1	0.253	263.465	47.4	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$184.0	$115.0	$299.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	art hall	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14		709.8	500	354.9	$63.9	Replace 32W T8 Lamps with 25W T8 Lamps	14	555.8	500	350	277.9	194.53	None Proposed	1	0.154	160.37	28.9	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$112.0	$70.0	$182.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	custodial	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	27	202.8	500	101.4	$18.3	Replace 32W T8 Lamps with 25W T8 Lamps	4	158.8	500	500	79.4	79.4	None Proposed	0	0.044	22	4.0	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$32.0	$20.0	$52.0	$0.0	$0
Roosevelt Intermediate School - Interior	b	boiler	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	40	720	500	360	$64.8	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	12	408	500	500	204	204	None Proposed	0	0.312	156	28.1	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$780.0	$1,488.0	$2,268.0	$62.4	$180

Appendix D - Lighting Upgrades

Building	Location	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Light Level (fc)	Existing Fixture Watts	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	Maintenance Cost Savings	Total Incentive
Roosevelt Intermediate School - Interior	001	supply	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2		120	2600	312	$56.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	2	68	2600	2600	176.8	176.8	None Proposed	0	0.052	135.2	24.3	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$130.0	$248.0	$378.0	$10.4	$30
Roosevelt Intermediate School - Interior	001	supply	26W CFL Fixture	1	20	26	2600	67.6	$12.2	None Proposed	1	26	2600	2600	67.6	67.6	None Proposed	0	0	0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	chorus	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	24	57	1216.8	2600	3163.68	$569.5	Replace 32W T8 Lamps with 25W T8 Lamps	24	952.8	2600	1820	2477.28	1734.096	None Proposed	1	0.264	1429.584	257.3	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$192.0	$120.0	$312.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	stage closet	26W CFL Fixture	2	3	52	2600	135.2	$24.3	None Proposed	2	52	2600	1820	135.2	94.64	None Proposed	1	0	40.56	7.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	light	PL4 CFL Fixture	3	9	78	2600	202.8	$36.5	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	3	48	2600	1820	124.8	87.36	None Proposed	1	0.03	115.44	20.8	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$30.0	$390.0	$420.0	$18.0	$0
Roosevelt Intermediate School - Interior	001	stage	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	8	7	256	2600	665.6	$119.8	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	8	136	2600	1820	353.6	247.52	None Proposed	1	0.12	418.08	75.3	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$520.0	$592.0	$1,112.0	$20.8	$40
Roosevelt Intermediate School - Interior	001	Auditorium	175W Fixture	10		2210	2600	5746	$1,034.3	None Proposed	10	2210	2600	1820	5746	4022.2	None Proposed	1	0	1723.8	310.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	balcany	300W Incandescent Fixture	9		2700	2600	7020	$1,263.6	Replace 300W Incandescent Fixture with 65W CFL	9	585	2600	1820	1521	1064.7	None Proposed	1	2.115	5955.3	1,072.0	$0.0	$39.0	$4.0	$0.0	$0.0	$4.0	$39.0	$43.0	$36.0	$350.6	$386.6	$302.4	$0
Roosevelt Intermediate School - Interior	001	back stage	PL4 CFL Fixture	3		78	2600	202.8	$36.5	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	3	48	2600	1820	124.8	87.36	None Proposed	1	0.03	115.44	20.8	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$30.0	$390.0	$420.0	$18.0	$0
Roosevelt Intermediate School - Interior	001	back stage	150W Incandescent Fixture	2		300	2600	780	$140.4	Replace 150W Incandescent Fixture with 25W CFL	2	50	2600	1820	130	91	None Proposed	1	0.25	689	124.0	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$8.0	$14.0	$22.0	$67.2	$0
Roosevelt Intermediate School - Interior	001	back stage	2x2 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	20	85.6	2600	222.56	$40.1	Replace T12 Bulbs With 32W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	50.7	2600	1820	131.82	92.274	None Proposed	1	0.0349	130.286	23.5	$70.0	$10.0	$65.0	$0.0	$0.0	$65.0	$80.0	$145.0	$65.0	$80.0	$145.0	$5.4	$0
Roosevelt Intermediate School - Interior	001	129	2x2 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	8	30	684.8	2600	1780.48	$320.5	Replace T12 Bulbs With 32W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	8	405.6	2600	1820	1054.56	738.192	None Proposed	1	0.2792	1042.288	187.6	$70.0	$10.0	$65.0	$0.0	$0.0	$65.0	$80.0	$145.0	$520.0	$640.0	$1,160.0	$43.4	$0
Roosevelt Intermediate School - Interior	001	band storage	2x2 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	5	30	428	2600	1112.8	$200.3	Replace T12 Bulbs With 32W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	5	253.5	2600	1820	659.1	461.37	None Proposed	1	0.1745	651.43	117.3	$70.0	$10.0	$65.0	$0.0	$0.0	$65.0	$80.0	$145.0	$325.0	$400.0	$725.0	$27.2	$0
Roosevelt Intermediate School - Interior	001	102	2x2 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	21	72	1797.6	2600	4673.76	$841.3	Replace T12 Bulbs With 32W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	21	1064.7	2600	1820	2768.22	1937.754	None Proposed	1	0.7329	2736.006	492.5	$70.0	$10.0	$65.0	$0.0	$0.0	$65.0	$80.0	$145.0	$1,365.0	$1,680.0	$3,045.0	$114.0	$0
Roosevelt Intermediate School - Interior	001	103	2x2 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	25	67	2140	2600	5564	$1,001.5	Replace T12 Bulbs With 32W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	25	1267.5	2600	1820	3295.5	2306.85	None Proposed	1	0.8725	3257.15	586.3	$70.0	$10.0	$65.0	$0.0	$0.0	$65.0	$80.0	$145.0	$1,625.0	$2,000.0	$3,625.0	$135.8	$0
Roosevelt Intermediate School - Interior	001	CUST BATH	150W Incandescent Fixture	1	9	150	2600	390	$70.2	Replace 150W Incandescent Fixture with 25W CFL	1	25	2600	1820	65	45.5	None Proposed	1	0.125	344.5	62.0	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$4.0	$7.0	$11.0	$33.6	$0
Roosevelt Intermediate School - Interior	001	cust off	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	16	61	2600	158.6	$28.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	2600	1820	88.4	61.88	None Proposed	1	0.027	96.72	17.4	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$10
Roosevelt Intermediate School - Interior	001	supply	PL4 CFL Fixtures	1		26	2600	67.6	$12.2	None Proposed.	1	26	2600	1820	67.6	47.32	None Proposed	1	0	20.28	3.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	106	1X4 Suspended Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	25	28	800	2600	2080	$374.4	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	25	425	2600	1820	1105	773.5	None Proposed	1	0.375	1306.5	235.2	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$1,625.0	$1,850.0	$3,475.0	$65.0	$125
Roosevelt Intermediate School - Interior	001	nurse	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	96	480	3120	1497.6	$269.6	Remove Ballast, Install 4-17W LED Tube Retrofit Bulbs	4	272	3120	2184	848.64	594.048	None Proposed	1	0.208	903.552	162.6	$24.0	$200.0	$65.0	$0.0	$0.0	$65.0	$224.0	$289.0	$260.0	$896.0	$1,156.0	$41.6	$80
Roosevelt Intermediate School - Interior	001	nurse	PL4 CFL Fixture	2		52	2080	108.16	$19.5	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	2	32	2080	2080	66.56	66.56	None Proposed	0	0.02	41.6	7.5	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$20.0	$260.0	$280.0	$12.0	$0
Roosevelt Intermediate School - Interior	001	nurse	150W Incandescent Fixture	2	26	300	2080	624	$112.3	Replace 150W Incandescent Fixture with 25W CFL	2	50	2080	2080	104	104	None Proposed	0	0.25	520	93.6	$0.0	$7.0	$4.0	$0.0	$0.0	$4.0	$7.0	$11.0	$8.0	$14.0	$22.0	$67.2	$0
Roosevelt Intermediate School - Interior	001	girls	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	6		192	500	96	$17.3	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	6	102	500	350	51	35.7	None Proposed	1	0.09	60.3	10.9	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$390.0	$444.0	$834.0	$15.6	$30
Roosevelt Intermediate School - Interior	001	girls	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	33	180	500	90	$16.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	500	350	51	35.7	None Proposed	1	0.078	54.3	9.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Roosevelt Intermediate School - Interior	001	under balcany	PL4 CFL Fixture	10		260	500	130	$23.4	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	10	160	500	350	80	56	None Proposed	1	0.1	74	13.3	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$100.0	$1,300.0	$1,400.0	$60.0	$0
Roosevelt Intermediate School - Interior	001	hall	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	26	1080	3120	3369.6	$606.5	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	18	612	3120	3120	1909.44	1909.44	None Proposed	0	0.468	1460.16	262.8	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$1,170.0	$2,232.0	$3,402.0	$93.6	$180
Roosevelt Intermediate School - Interior	001	boys	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	40	180	3120	561.6	$101.1	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	3	102	3120	2184	318.24	222.768	None Proposed	1	0.078	338.832	61.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$195.0	$372.0	$567.0	$15.6	$30
Roosevelt Intermediate School - Interior	001	boys	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	6		192	2600	499.2	$89.9	Remove Ballast, Install 1-17W LED Tube Retrofit Bulbs	6	102	2600	1820	265.2	185.64	None Proposed	1	0.09	313.56	56.4	$24.0	$50.0	$65.0	$0.0	$0.0	$65.0	$74.0	$139.0	$390.0	$444.0	$834.0	$15.6	$30
Roosevelt Intermediate School - Interior	001	boys	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	26	507	500	253.5	$45.6	Replace 32W T8 Lamps with 25W T8 Lamps	10	397	500	350	198.5	138.95	None Proposed	1	0.11	114.55	20.6	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$80.0	$50.0	$130.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	closet	PL4 CFL Fixture	1		26	3120	81.12	$14.6	Remove CFL Bulb, Install Terralux DLR7-H Retrofit Kit	1	16	3120	2184	49.92	34.944	None Proposed	1	0.01	46.176	8.3	$0.0	$130.0	$10.0	$0.0	$0.0	$10.0	$130.0	$140.0	$10.0	$130.0	$140.0	$6.0	$0
Roosevelt Intermediate School - Interior	001	closet	1x2 Fixture w/ 2-T12 Lamps w/ Magnetic Ballasts	1		46	3120	143.52	$25.8	Replace T12 Bulbs With 17W T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	30	3120	2184	93.6	65.52	None Proposed	1	0.016	78	14.0	$55.0	$10.0	$65.0	$0.0	$0.0	$65.0	$65.0	$130.0	$65.0	$65.0	$130.0	$2.1	$0
Roosevelt Intermediate School - Interior	001	copy	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	80	360	3120	1123.2	$202.2	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	6	204	3120	2184	636.48	445.536	None Proposed	1	0.156	677.664	122.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$390.0	$744.0	$1,134.0	$31.2	$90
Roosevelt Intermediate School - Interior	001	main office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	34	65	2040	3120	6364.8	$1,145.7	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	34	1156	3120	2184	3606.72	2524.704	None Proposed	1	0.884	3840.096	691.2	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$2,210.0	$4,216.0	$6,426.0	$176.8	$510
Roosevelt Intermediate School - Interior	001	closet	40W Incandescent Fixture	1		40	3640	145.6	$26.2	Replace 40W Incandescent Fixture with 13W CFL	1	13	3640	3640	47.32	47.32	None Proposed	0	0.027	98.28	17.7	$0.0	$6.3	$4.0	$0.0	$0.0	$4.0	$6.3	$10.3	$4.0	$6.3	$10.3	$21.3	$0
Roosevelt Intermediate School - Interior	001	off bath	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1		50.7	3120	158.184	$28.5	Replace 32W T8 Lamps with 25W T8 Lamps	1	39.7	3120	3120	123.864	123.864	None Proposed	0	0.011	34.32	6.2	$0.0	$5.0	$8.0	$0.0	$0.0	$8.0	$5.0	$13.0	$8.0	$5.0	$13.0	$0.0	$0
Roosevelt Intermediate School - Interior	001	secretary	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	67	90	3120	280.8	$50.5	Remove Ballast, Install 3-17W LED Tube Retrofit Bulbs	1	51	3120	2184	159.12	111.384	None Proposed	1	0.039	169.416	30.5	$24.0	$150.0	$65.0	$0.0	$0.0	$65.0	$174.0	$239.0	$65.0	$174.0	$239.0	$7.8	$15
Roosevelt Intermediate School - Interior	001	supply	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	25	60	8760	525.6	$94.6	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	1	34	8760	8760	297.84	297.84	None Proposed	0	0.026	227.76	41.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$65.0	$124.0	$189.0	$5.2	$15
Roosevelt Intermediate School - Interior	001	stair	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	16	420	8760	3679.2	$662.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	8760	8760	2084.88	2084.88	None Proposed	0	0.182	1594.32	287.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$105
Roosevelt Intermediate School - Interior	001	stair	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7		420	8760	3679.2	$662.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	8760	8760	2084.88	2084.88	None Proposed	0	0.182	1594.32	287.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$105
Roosevelt Intermediate School - Interior	001	stair	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	21	420	8760	3679.2	$662.3	Remove Ballast, Install 2-17W LED Tube Retrofit Bulbs	7	238	8760	8760	2084.88	2084.88	None Proposed	0	0.182	1594.32	287.0	$24.0	$100.0	$65.0	$0.0	$0.0	$65.0	$124.0	$189.0	$455.0	$868.0	$1,323.0	$36.4	$105

ECM	Westfield High School - Interior	Administration Building - Interior	Lincoln Elementary School - Interior	Tamaques Elementary School - Interior
Assumed Inflation (Gas)	2%	2%	2%	2%
Initial Yearly Savings (Gas)				
Assumed Inflation (Electricity)	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$86,270.28	$9,908.62	$7,200.42	$16,491.10
Assumed Average Useful Life (Years)	15	15	15	15
Lifetime Savings	**$1,604,533.54**	**$184,289.62**	**$133,920.08**	**$306,716.53**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$86,270.28	$9,908.62	$7,200.42	$16,491.10
2	$88,858.39	$10,205.88	$7,416.44	$16,985.83
3	$91,524.14	$10,512.06	$7,638.93	$17,495.41
4	$94,269.87	$10,827.42	$7,868.10	$18,020.27
5	$97,097.96	$11,152.24	$8,104.14	$18,560.88
6	$100,010.90	$11,486.81	$8,347.27	$19,117.70
7	$103,011.23	$11,831.41	$8,597.68	$19,691.23
8	$106,101.56	$12,186.36	$8,855.61	$20,281.97
9	$109,284.61	$12,551.95	$9,121.28	$20,890.43
10	$112,563.15	$12,928.51	$9,394.92	$21,517.14
11	$115,940.04	$13,316.36	$9,676.77	$22,162.66
12	$119,418.25	$13,715.85	$9,967.07	$22,827.54
13	$123,000.79	$14,127.33	$10,266.08	$23,512.36
14	$126,690.82	$14,551.15	$10,574.07	$24,217.73
15	$130,491.54	$14,987.68	$10,891.29	$24,944.27

ECM	Roosevelt Intermediate School - Interior	Edison Intermediate School - Interior	Kehler Stadium Field House - Interior	Jefferson Elementary School - Interior
Assumed Inflation (Gas)	2%	2%	2%	2%
Initial Yearly Savings (Gas)				
Assumed Inflation (Electricity)	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$30,022.60	$31,158.71	$2,551.84	$11,083.04
Assumed Average Useful Life (Years)	15	15	15	15
Lifetime Savings	**$558,387.78**	**$579,518.09**	**$47,461.53**	**$206,132.52**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$30,022.60	$31,158.71	$2,551.84	$11,083.04
2	$30,923.28	$32,093.47	$2,628.40	$11,415.53
3	$31,850.98	$33,056.27	$2,707.25	$11,758.00
4	$32,806.51	$34,047.96	$2,788.47	$12,110.74
5	$33,790.70	$35,069.40	$2,872.12	$12,474.06
6	$34,804.42	$36,121.48	$2,958.29	$12,848.28
7	$35,848.56	$37,205.12	$3,047.04	$13,233.73
8	$36,924.01	$38,321.28	$3,138.45	$13,630.74
9	$38,031.73	$39,470.92	$3,232.60	$14,039.66
10	$39,172.69	$40,655.04	$3,329.58	$14,460.85
11	$40,347.87	$41,874.70	$3,429.47	$14,894.68
12	$41,558.30	$43,130.94	$3,532.35	$15,341.52
13	$42,805.05	$44,424.86	$3,638.32	$15,801.77
14	$44,089.20	$45,757.61	$3,747.47	$16,275.82
15	$45,411.88	$47,130.34	$3,859.89	$16,764.09

ECM	McKinley Elementary School - Interior	Wilson Elementary School - Interior	Franklin Elementary School - Interior	Washington Elementary School - Interior
Assumed Inflation (Gas)	2%	2%	2%	2%
Initial Yearly Savings (Gas)				
Assumed Inflation (Electricity)	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$11,083.33	$14,242.88	$12,697.14	$4,525.33
Assumed Average Useful Life (Years)	15	15	15	15
Lifetime Savings	**$206,137.82**	**$264,902.07**	**$236,152.96**	**$84,166.20**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$11,083.33	$14,242.88	$12,697.14	$4,525.33
2	$11,415.83	$14,670.17	$13,078.05	$4,661.09
3	$11,758.30	$15,110.27	$13,470.39	$4,800.92
4	$12,111.05	$15,563.58	$13,874.50	$4,944.95
5	$12,474.38	$16,030.49	$14,290.74	$5,093.30
6	$12,848.61	$16,511.40	$14,719.46	$5,246.10
7	$13,234.07	$17,006.74	$15,161.05	$5,403.48
8	$13,631.09	$17,516.94	$15,615.88	$5,565.58
9	$14,040.03	$18,042.45	$16,084.35	$5,732.55
10	$14,461.23	$18,583.73	$16,566.88	$5,904.53
11	$14,895.06	$19,141.24	$17,063.89	$6,081.66
12	$15,341.91	$19,715.48	$17,575.81	$6,264.11
13	$15,802.17	$20,306.94	$18,103.08	$6,452.04
14	$16,276.24	$20,916.15	$18,646.17	$6,645.60
15	$16,764.52	$21,543.63	$19,205.56	$6,844.97

IRR, NPV, AROI

Inflation Rate: **3%**

Lighting Upgrades **Westfield High School - Interior**	
Life of ECRM (Yrs):	**15**
Year	Cash Flow
0	**($804,260.3)**
1	**$86,270.3**
2	$88,858.4
3	$91,524.1
4	$94,269.9
5	$97,098.0
6	$100,010.9
7	$103,011.2
8	$106,101.6
9	$109,284.6
10	$112,563.2
11	$115,940.0
12	$119,418.2
13	$123,000.8
14	$126,690.8
15	$130,491.5
IRR	9.4%
NPV	$452,103.0
AROI	4.1%

Lighting Upgrades **Administration Building - Interior**	
Life of ECRM (Yrs):	**15**
Year	Cash Flow
0	**($100,108.0)**
1	**$9,908.6**
2	$10,205.9
3	$10,512.1
4	$10,827.4
5	$11,152.2
6	$11,486.8
7	$11,831.4
8	$12,186.4
9	$12,551.9
10	$12,928.5
11	$13,316.4
12	$13,715.9
13	$14,127.3
14	$14,551.1
15	$14,987.7
IRR	8.1%
NPV	$44,192.3
AROI	3.2%

Lighting Upgrades **Roosevelt Intermediate School - Interior**	
Life of ECRM (Yrs):	**15**
Year	Cash Flow
0	**($312,098.1)**
1	**$30,022.6**
2	$30,923.3
3	$31,851.0
4	$32,806.5
5	$33,790.7
6	$34,804.4
7	$35,848.6
8	$36,924.0
9	$38,031.7
10	$39,172.7
11	$40,347.9
12	$41,558.3
13	$42,805.1
14	$44,089.2
15	$45,411.9
IRR	7.7%
NPV	$125,124.2
AROI	3.0%

Lighting Upgrades **Edison Intermediate School - Interior**	
Life of ECRM (Yrs):	**15**
Year	Cash Flow
0	**($361,255.7)**
1	**$31,158.7**
2	$32,093.5
3	$33,056.3
4	$34,048.0
5	$35,069.4
6	$36,121.5
7	$37,205.1
8	$38,321.3
9	$39,470.9
10	$40,655.0
11	$41,874.7
12	$43,130.9
13	$44,424.9
14	$45,757.6
15	$47,130.3
IRR	6.1%
NPV	$92,511.9
AROI	2.0%

Lighting Upgrades **McKinley Elementary School - Interior**	
Life of ECRM (Yrs):	**15**
Year	Cash Flow
0	**($93,256.8)**
1	**$11,083.3**
2	$11,415.8
3	$11,758.3
4	$12,111.0
5	$12,474.4
6	$12,848.6
7	$13,234.1
8	$13,631.1
9	$14,040.0
10	$14,461.2
11	$14,895.1
12	$15,341.9
13	$15,802.2
14	$16,276.2
15	$16,764.5
IRR	11.0%
NPV	$68,150.9
AROI	5.2%

Lighting Upgrades **Wilson Elementary School - Interior**	
Life of ECRM (Yrs):	**15**
Year	Cash Flow
0	**($143,957.8)**
1	**$14,242.9**
2	$14,670.2
3	$15,110.3
4	$15,563.6
5	$16,030.5
6	$16,511.4
7	$17,006.7
8	$17,516.9
9	$18,042.5
10	$18,583.7
11	$19,141.2
12	$19,715.5
13	$20,306.9
14	$20,916.1
15	$21,543.6
IRR	8.1%
NPV	$63,462.7
AROI	3.2%

IRR, NPV, AROI

Inflation Rate: **3%**

Lighting Upgrades **Lincoln Elementary School - Interior**		**Lighting Upgrades** **Tamaques Elementary School - Interior**	
Life of ECRM (Yrs):	**15**	Life of ECRM (Yrs):	**15**
Year	Cash Flow	Year	Cash Flow
0	**($77,815.2)**	0	**($164,118.9)**
1	**$7,200.4**	1	**$16,491.1**
2	$7,416.4	2	$16,985.8
3	$7,638.9	3	$17,495.4
4	$7,868.1	4	$18,020.3
5	$8,104.1	5	$18,560.9
6	$8,347.3	6	$19,117.7
7	$8,597.7	7	$19,691.2
8	$8,855.6	8	$20,282.0
9	$9,121.3	9	$20,890.4
10	$9,394.9	10	$21,517.1
11	$9,676.8	11	$22,162.7
12	$9,967.1	12	$22,827.5
13	$10,266.1	13	$23,512.4
14	$10,574.1	14	$24,217.7
15	$10,891.3	15	$24,944.3
IRR	7.1%	IRR	8.3%
NPV	$27,045.4	NPV	$76,042.8
AROI	2.6%	AROI	3.4%
Lighting Upgrades **Kehler Stadium Field House - Interior**		**Lighting Upgrades** **Jefferson Elementary School - Interior**	
Life of ECRM (Yrs):	**15**	Life of ECRM (Yrs):	**15**
Year	Cash Flow	Year	Cash Flow
0	**($31,951.8)**	0	**($122,316.5)**
1	**$2,551.8**	1	**$11,083.0**
2	$2,628.4	2	$11,415.5
3	$2,707.3	3	$11,758.0
4	$2,788.5	4	$12,110.7
5	$2,872.1	5	$12,474.1
6	$2,958.3	6	$12,848.3
7	$3,047.0	7	$13,233.7
8	$3,138.4	8	$13,630.7
9	$3,232.6	9	$14,039.7
10	$3,329.6	10	$14,460.9
11	$3,429.5	11	$14,894.7
12	$3,532.3	12	$15,341.5
13	$3,638.3	13	$15,801.8
14	$3,747.5	14	$16,275.8
15	$3,859.9	15	$16,764.1
IRR	5.0%	IRR	6.8%
NPV	$5,211.0	NPV	$39,087.0
AROI	1.3%	AROI	2.4%
Lighting Upgrades **Franklin Elementary School - Interior**		**Lighting Upgrades** **Washington Elementary School - Interior**	
Life of ECRM (Yrs):	**15**	Life of ECRM (Yrs):	**15**
Year	Cash Flow	Year	Cash Flow
0	**($152,517.1)**	0	**($107,491.1)**
1	**$12,697.1**	1	**$4,525.3**
2	$13,078.1	2	$4,661.1
3	$13,470.4	3	$4,800.9
4	$13,874.5	4	$4,944.9
5	$14,290.7	5	$5,093.3
6	$14,719.5	6	$5,246.1
7	$15,161.0	7	$5,403.5
8	$15,615.9	8	$5,565.6
9	$16,084.4	9	$5,732.6
10	$16,566.9	10	$5,904.5
11	$17,063.9	11	$6,081.7
12	$17,575.8	12	$6,264.1
13	$18,103.1	13	$6,452.0
14	$18,646.2	14	$6,645.6
15	$19,205.6	15	$6,845.0
IRR	5.6%	IRR	(2.7%)
NPV	$32,392.6	NPV	($41,588.2)
AROI	1.7%	AROI	(2.5%)

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Westfield Board of Ed
Estimate by: BRM
Checked by: CDW

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	McKinley Elementary School - Interior									
1	Lighting Upgrades	1	ea.	$ 46,818.25	$ 46,818.25	1	ea.	$ 21,103.00	$ 21,103.00	$ 67,921.25
	Subtotal				$ 46,818.25				$ 21,103.00	

SUBTOTAL =	$ 67,921.25
MARKUP % =	$ 0.15
MARKUP =	$ 10,188.19
SUB-TOTAL w/ OH & P =	$ 78,109.44
CONTINGENCY % =	0.25
CONTINGENCY =	$ 19,527.36
BUDGET COST ESTIMATE =	$ 97,636.80

Notes:
1. CDMSmith has no control over the cost of labor, materials, equipment, services furnished or market conditions.
2. CDMSmith does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

o "This is an Opinion of Probable Construction Cost only. CDMSmith has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, competitive bidding, market conditions or negotiating terms. CDMSmith does not guarantee that this opinion will not vary from actual cost, or contractor's bids. There are not any costs provided for: Change Orders, Design Engineering, Construction Oversight, Client Costs, Finance or Funding Costs, Legal Fees, Land Acquisition or temporary/permanent Easements, Operations, or any other costs associated with this project that are not specifically part of the bidding contractor's proposed scope.

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Wilson Elementary School - Interior									
1	Lighting Upgrades	1	ea.	$ 72,159.50	$ 72,159.50	1	ea.	$ 32,799.00	$ 32,799.00	$ 104,958.50
	Subtotal				$ 72,159.50				$ 32,799.00	

SUBTOTAL =	$ 104,958.50
MARKUP % =	$ 0.15
MARKUP =	$ 15,743.78
SUB-TOTAL w/ OH & P =	$ 120,702.28
CONTINGENCY % =	0.25
CONTINGENCY =	$ 30,175.57
BUDGET COST ESTIMATE =	$ 150,877.84

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Westfield Board of Ed
Estimate by: BRM
Checked by: CDW

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Washington Elementary School - Interior									
1	Lighting Upgrades	1	ea.	$ 75,408.00	$ 75,408.00	1	ea.	$ 35,230.00	$ 35,230.00	$ 110,638.00
	Subtotal				$ 75,408.00				$ 35,230.00	

SUBTOTAL =	$	110,638.00
MARKUP % =	$	0.15
MARKUP =	$	16,595.70
SUB-TOTAL w/ OH & P =	$	127,233.70
CONTINGENCY % =		0.25
CONTINGENCY =	$	31,808.43
BUDGET COST ESTIMATE =	$	159,042.13

Notes:
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4. Escalation not included in estimate.
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Westfield High School - Interior									
1	Lighting Upgrades	1	ea.	$ 398,574.00	$ 398,574.00	1	ea.	$ 188,741.00	$ 188,741.00	$ 587,315.00
	Subtotal				$ 398,574.00				$ 188,741.00	

SUBTOTAL =	$	587,315.00
MARKUP % =	$	0.15
MARKUP =	$	88,097.25
SUB-TOTAL w/ OH & P =	$	675,412.25
CONTINGENCY % =		0.25
CONTINGENCY =	$	168,853.06
BUDGET COST ESTIMATE =	$	844,265.31

Notes:
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4. Escalation not included in estimate.
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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Westfield Board of Ed
Estimate by: BRM
Checked by: CDW

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Roosevelt Intermediate School - Interior									
1	Lighting Upgrades	1	ea.	$ 145,703.05	$ 145,703.05	1	ea.	$ 80,560.00	$ 80,560.00	$ 226,263.05
	Subtotal				$ 145,703.05				$ 80,560.00	

SUBTOTAL =	$ 226,263.05
MARKUP % =	$ 0.15
MARKUP =	$ 33,939.46
SUB-TOTAL w/ OH & P =	$ 260,202.51
CONTINGENCY % =	0.25
CONTINGENCY =	$ 65,050.63
BUDGET COST ESTIMATE =	$ 325,253.13

Notes:
1. CDMSmith has no control over the cost of labor, materials, equipment, services furnished or market conditions.
2. CDMSmith does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Administration Building - Interior									
1	Lighting Upgrades	1	ea.	$ 49,113.00	$ 49,113.00	1	ea.	$ 23,863.00	$ 23,863.00	$ 72,976.00
	Subtotal				$ 49,113.00				$ 23,863.00	

SUBTOTAL =	$ 72,976.00
MARKUP % =	$ 0.15
MARKUP =	$ 10,946.40
SUB-TOTAL w/ OH & P =	$ 83,922.40
CONTINGENCY % =	0.25
CONTINGENCY =	$ 20,980.60
BUDGET COST ESTIMATE =	$ 104,903.00

Notes:
1. CDMSmith has no control over the cost of labor, materials, equipment, services furnished or market conditions.
2. CDMSmith does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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CDMSmith

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Westfield Board of Ed
Estimate by: BRM
Checked by: CDW

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Edison Intermediate School - Interior									
1	Lighting Upgrades	1	ea.	$ 175,029.00	$ 175,029.00	1	ea.	$ 88,168.00	$ 88,168.00	$ 263,197.00
	Subtotal				$ 175,029.00				$ 88,168.00	

SUBTOTAL =	$	263,197.00
MARKUP % =	$	0.15
MARKUP =	$	39,479.55
SUB-TOTAL w/ OH & P =	$	302,676.55
CONTINGENCY % =		0.25
CONTINGENCY =	$	75,669.14
BUDGET COST ESTIMATE =	$	378,345.69

Notes:
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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Lincoln Elementary School - Interior									
1	Lighting Upgrades	1	ea.	$ 37,636.00	$ 37,636.00	1	ea.	$ 18,785.00	$ 18,785.00	$ 56,421.00
	Subtotal				$ 37,636.00				$ 18,785.00	

SUBTOTAL =	$	56,421.00
MARKUP % =	$	0.15
MARKUP =	$	8,463.15
SUB-TOTAL w/ OH & P =	$	64,884.15
CONTINGENCY % =		0.25
CONTINGENCY =	$	16,221.04
BUDGET COST ESTIMATE =	$	81,105.19

Notes:
1. CDMSmith has no control over the cost of labor, materials, equipment, services furnished or market conditions.
2. CDMSmith does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Westfield Board of Ed
Estimate by: BRM
Checked by: CDW

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Kehler Stadium Field House - Interior									
1	Lighting Upgrades	1	ea.	$ 15,558.00	$ 15,558.00	1	ea.	$ 7,605.00	$ 7,605.00	$ 23,163.00
	Subtotal				$ 15,558.00				$ 7,605.00	

SUBTOTAL =	$	23,163.00
MARKUP % =	$	0.15
MARKUP =	$	3,474.45
SUB-TOTAL w/ OH & P =	$	26,637.45
CONTINGENCY % =		0.25
CONTINGENCY =	$	6,659.36
BUDGET COST ESTIMATE =	$	33,296.81

Notes:
1. CDMSmith has no control over the cost of labor, materials, equipment, services furnished or market conditions.
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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Franklin Elementary School - Interior									
1	Lighting Upgrades	1	ea.	$ 75,408.00	$ 75,408.00	1	ea.	$ 35,230.00	$ 35,230.00	$ 110,638.00
	Subtotal				$ 75,408.00				$ 35,230.00	

SUBTOTAL =	$	110,638.00
MARKUP % =	$	0.15
MARKUP =	$	16,595.70
SUB-TOTAL w/ OH & P =	$	127,233.70
CONTINGENCY % =		0.25
CONTINGENCY =	$	31,808.43
BUDGET COST ESTIMATE =	$	159,042.13

Notes:
1. CDMSmith has no control over the cost of labor, materials, equipment, services furnished or market conditions.
2. CDMSmith does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Westfield Board of Ed
Estimate by: BRM
Checked by: CDW

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Tamaques Elementary School - Interior									
1	Lighting Upgrades	1	ea.	$ 79,629.00	$ 79,629.00	1	ea.	$ 40,485.00	$ 40,485.00	$ 120,114.00
	Subtotal				$ 79,629.00				$ 40,485.00	

SUBTOTAL =	$ 120,114.00
MARKUP % =	$ 0.15
MARKUP =	$ 18,017.10
SUB-TOTAL w/ OH & P =	$ 138,131.10
CONTINGENCY % =	0.25
CONTINGENCY =	$ 34,532.78
BUDGET COST ESTIMATE =	$ 172,663.88

Notes:
1. CDMSmith has no control over the cost of labor, materials, equipment, services furnished or market conditions.
2. CDMSmith does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Jefferson Elementary School - Interior									
1	Lighting Upgrades	1	ea.	$ 62,188.00	$ 62,188.00	1	ea.	$ 26,780.00	$ 26,780.00	$ 88,968.00
	Subtotal				$ 62,188.00				$ 26,780.00	

SUBTOTAL =	$ 88,968.00
MARKUP % =	$ 0.15
MARKUP =	$ 13,345.20
SUB-TOTAL w/ OH & P =	$ 102,313.20
CONTINGENCY % =	0.25
CONTINGENCY =	$ 25,578.30
BUDGET COST ESTIMATE =	$ 127,891.50

Notes:
1. CDMSmith has no control over the cost of labor, materials, equipment, services furnished or market conditions.
2. CDMSmith does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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Appendix E

SUMMARY DATA

Solar kWh:	1,432,745.0
Utility Savings:	$258,785.9
SRECS:	$261,547.6
Maitenance Costs:	-$28,654.9
Total Cost (For All Systems):	$10,787,500.0

ID	Building Name	AROI	IRR	NPV	Lifetime Savings	Simple Payback	Energy Savings ($)	SRECS
1	Westfield High School	1.01%	1.86%	($193,290.53)	$1,560,602.4	19.9	$42,804	$43,410.4
2	Edison Intermediate School	0.18%	0.15%	($191,397.34)	$520,200.8	23.9	$14,268	$16,278.9
3	Roosevelt Intermediate School	0.89%	1.64%	($176,217.90)	$1,170,451.8	20.5	$32,103	$32,557.8
4	Franklin Elementary School	1.16%	2.19%	($138,906.01)	$1,647,302.5	19.4	$45,182	$43,410.4
5	Jefferson Elementary School	0.89%	1.64%	($176,217.90)	$1,170,451.8	20.5	$32,103	$32,557.8
6	Lincoln Elementary School	0.65%	1.22%	($159,145.26)	$780,301.2	21.5	$21,402	$21,705.2
7	McKinley Elementary School	0.31%	0.50%	($171,003.14)	$552,713.3	23.2	$15,160	$16,278.9
8	Tamaques Elementary School	0.65%	1.22%	($159,145.26)	$780,301.2	21.5	$21,402.0	$21,705.2
9	Washington Elementary School	0.19%	0.43%	($128,476.50)	$411,825.6	23.9	$11,295.5	$10,852.6
10	Wilson Elementary School	0.19%	0.43%	($128,476.50)	$411,825.6	23.9	$11,295.5	$10,852.6
11	Administration Building	0.07%	0.12%	($142,072.63)	$390,150.6	24.6	$10,701.0	$10,852.6
12	Kehler Stadium Field House	-2.75%	-7.69%	($126,707.26)	$39,015.1	79.8	$1,070.1	$1,085.3

Westfield High School

Design Goal: Provide

19% Westfield High Sch 0.18 302300 1261778

Existing Conditons

Average Annual Electrical Usage (kWh)	1,261,778
Current Utility Price ($/kWh)	0.18
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	200
Roof Space Needed (sq-ft)	20,000.00
Annual Solar kWh (PV Watts)	237,800
Net System installation Cost ($6/kWh)	$1,200,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$1,300,000**
Materials	$910,000
Labor	$390,000
Engineers Opinion of Probable Cost	$1,625,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1800	237,800.0	$42,804.0	$43,410	($4,756)	$81,458.4	$81,458.4	$0.183	
2	0.1854	236,611.0	$43,867.7	$43,193	($4,732)	$82,328.8	$163,787.2	$0.183	
3	0.1910	235,427.9	$44,957.8	$42,977	($4,709)	$83,226.6	$247,013.8	$0.183	
4	0.1967	234,250.8	$46,075.0	$42,762	($4,685)	$84,152.5	$331,166.3	$0.183	
5	0.2026	233,079.6	$47,220.0	$42,549	($4,662)	$85,107.0	$416,273.3	$0.183	
6	0.2087	231,914.2	$48,393.4	$42,336	($4,638)	$86,091.0	$502,364.3	$0.183	
7	0.2149	230,754.6	$49,595.9	$42,124	($4,615)	$87,105.1	$589,469.4	$0.183	
8	0.2214	229,600.8	$50,828.4	$41,914	($4,592)	$88,150.0	$677,619.4	$0.183	
9	0.2280	228,452.8	$52,091.5	$41,704	($4,569)	$89,226.5	$766,845.9	$0.183	
10	0.2349	227,310.5	$53,386.0	$41,496	($4,546)	$90,335.3	$857,181.2	$0.183	
11	0.2419	226,174.0	$54,712.6	$41,288	($4,523)	$91,477.2	$948,658.4	$0.183	
12	0.2492	225,043.1	$56,072.2	$41,082	($4,501)	$92,653.0	$1,041,311.4	$0.183	
13	0.2566	223,917.9	$57,465.6	$40,876	($4,478)	$93,863.5	$1,135,174.8	$0.183	
14	0.2643	222,798.3	$58,893.6	$40,672	($4,456)	$95,109.5	$1,230,284.3	$0.183	
15	0.2723	221,684.3	$60,357.1	$40,468	($4,434)	$96,391.9	$1,326,676.3	$0.183	
16	0.2804	220,575.9	$61,857.0	$5,514	($4,412)	$62,959.9	$1,389,636.2		$0.025
17	0.2888	219,473.0	$63,394.2	$5,487	($4,389)	$64,491.5	$1,454,127.7		$0.025
18	0.2975	218,375.7	$64,969.5	$5,459	($4,368)	$66,061.4	$1,520,189.1		$0.025
19	0.3064	217,283.8	$66,584.0	$5,432	($4,346)	$67,670.4	$1,587,859.5		$0.025
20	0.3156	216,197.4	$68,238.6	$5,405	($4,324)	$69,319.6	$1,657,179.1		$0.025
21	0.3251	215,116.4	$69,934.3	$5,378	($4,302)	$71,009.9	$1,728,189.0		$0.025
22	0.3349	214,040.8	$71,672.2	$5,351	($4,281)	$72,742.4	$1,800,931.4		$0.025
23	0.3449	212,970.6	$73,453.3	$5,324	($4,259)	$74,518.1	$1,875,449.5		$0.025
24	0.3552	211,905.7	$75,278.6	$5,298	($4,238)	$76,338.1	$1,951,787.6		$0.025
25	0.3659	210,846.2	$77,149.2	$5,271	($4,217)	$78,203.5	$2,029,991.1		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Edison Intermediate School
Design Goal: Provide
20% Westfield High Sch 0.18 302300 1261778

Existing Conditons

Average Annual Electrical Usage (kWh)	437,077
Current Utility Price ($/kWh)	0.16
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	75
Roof Space Needed (sq-ft)	7,500.00
Annual Solar kWh (PV Watts)	89,175
Net System installation Cost ($6/kWh)	$450,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$550,000**
Materials	$385,000
Labor	$165,000
Engineers Opinion of Probable Cost	$687,500

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1600	89,175.0	$14,268.0	$16,279	($1,784)	$28,763.4	$28,763.4	$0.183	
2	0.1648	88,729.1	$14,622.6	$16,198	($1,775)	$29,045.5	$57,808.9	$0.183	
3	0.1697	88,285.5	$14,985.9	$16,117	($1,766)	$29,336.7	$87,145.6	$0.183	
4	0.1748	87,844.1	$15,358.3	$16,036	($1,757)	$29,637.4	$116,783.0	$0.183	
5	0.1801	87,404.8	$15,740.0	$15,956	($1,748)	$29,947.6	$146,730.6	$0.183	
6	0.1855	86,967.8	$16,131.1	$15,876	($1,739)	$30,267.7	$176,998.4	$0.183	
7	0.1910	86,533.0	$16,532.0	$15,797	($1,731)	$30,597.9	$207,596.3	$0.183	
8	0.1968	86,100.3	$16,942.8	$15,718	($1,722)	$30,938.4	$238,534.7	$0.183	
9	0.2027	85,669.8	$17,363.8	$15,639	($1,713)	$31,289.5	$269,824.2	$0.183	
10	0.2088	85,241.5	$17,795.3	$15,561	($1,705)	$31,651.3	$301,475.5	$0.183	
11	0.2150	84,815.2	$18,237.5	$15,483	($1,696)	$32,024.3	$333,499.7	$0.183	
12	0.2215	84,391.2	$18,690.7	$15,406	($1,688)	$32,408.5	$365,908.3	$0.183	
13	0.2281	83,969.2	$19,155.2	$15,329	($1,679)	$32,804.4	$398,712.6	$0.183	
14	0.2350	83,549.4	$19,631.2	$15,252	($1,671)	$33,212.2	$431,924.8	$0.183	
15	0.2420	83,131.6	$20,119.0	$15,176	($1,663)	$33,632.1	$465,556.9	$0.183	
16	0.2493	82,716.0	$20,619.0	$2,068	($1,654)	$21,032.6	$486,589.5		$0.025
17	0.2568	82,302.4	$21,131.4	$2,058	($1,646)	$21,542.9	$508,132.4		$0.025
18	0.2645	81,890.9	$21,656.5	$2,047	($1,638)	$22,066.0	$530,198.3		$0.025
19	0.2724	81,481.4	$22,194.7	$2,037	($1,630)	$22,602.1	$552,800.4		$0.025
20	0.2806	81,074.0	$22,746.2	$2,027	($1,621)	$23,151.6	$575,952.0		$0.025
21	0.2890	80,668.6	$23,311.4	$2,017	($1,613)	$23,714.8	$599,666.8		$0.025
22	0.2976	80,265.3	$23,890.7	$2,007	($1,605)	$24,292.1	$623,958.8		$0.025
23	0.3066	79,864.0	$24,484.4	$1,997	($1,597)	$24,883.7	$648,842.6		$0.025
24	0.3158	79,464.7	$25,092.9	$1,987	($1,589)	$25,490.2	$674,332.8		$0.025
25	0.3252	79,067.3	$25,716.4	$1,977	($1,581)	$26,111.8	$700,444.5		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Roosevelt Intermediate School
Design Goal: Provide
31% Westfield High Sc 0.18 302300 1261778

Existing Conditons

Average Annual Electrical Usage (kWh)	566,412
Current Utility Price ($/kWh)	0.18
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	150
Roof Space Needed (sq-ft)	15,000.00
Annual Solar kWh (PV Watts)	178,350
Net System installation Cost ($6/kWh)	$900,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$1,000,000**
Materials	$700,000
Labor	$300,000
Engineers Opinion of Probable Cost	$1,250,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1800	178,350.0	$32,103.0	$32,558	($3,567)	$61,093.8	$61,093.8	$0.183	
2	0.1854	177,458.3	$32,900.8	$32,395	($3,549)	$61,746.6	$122,840.4	$0.183	
3	0.1910	176,571.0	$33,718.3	$32,233	($3,531)	$62,420.0	$185,260.3	$0.183	
4	0.1967	175,688.1	$34,556.2	$32,072	($3,514)	$63,114.3	$248,374.7	$0.183	
5	0.2026	174,809.7	$35,415.0	$31,912	($3,496)	$63,830.3	$312,205.0	$0.183	
6	0.2087	173,935.6	$36,295.0	$31,752	($3,479)	$64,568.3	$376,773.2	$0.183	
7	0.2149	173,065.9	$37,197.0	$31,593	($3,461)	$65,328.8	$442,102.1	$0.183	
8	0.2214	172,200.6	$38,121.3	$31,435	($3,444)	$66,112.5	$508,214.6	$0.183	
9	0.2280	171,339.6	$39,068.6	$31,278	($3,427)	$66,919.9	$575,134.4	$0.183	
10	0.2349	170,482.9	$40,039.5	$31,122	($3,410)	$67,751.5	$642,885.9	$0.183	
11	0.2419	169,630.5	$41,034.5	$30,966	($3,393)	$68,607.9	$711,493.8	$0.183	
12	0.2492	168,782.3	$42,054.2	$30,811	($3,376)	$69,489.7	$780,983.5	$0.183	
13	0.2566	167,938.4	$43,099.2	$30,657	($3,359)	$70,397.6	$851,381.1	$0.183	
14	0.2643	167,098.7	$44,170.2	$30,504	($3,342)	$71,332.1	$922,713.3	$0.183	
15	0.2723	166,263.2	$45,267.9	$30,351	($3,325)	$72,293.9	$995,007.2	$0.183	
16	0.2804	165,431.9	$46,392.8	$4,136	($3,309)	$47,219.9	$1,042,227.1		$0.025
17	0.2888	164,604.8	$47,545.6	$4,115	($3,292)	$48,368.6	$1,090,595.8		$0.025
18	0.2975	163,781.7	$48,727.1	$4,095	($3,276)	$49,546.0	$1,140,141.8		$0.025
19	0.3064	162,962.8	$49,938.0	$4,074	($3,259)	$50,752.8	$1,190,894.6		$0.025
20	0.3156	162,148.0	$51,179.0	$4,054	($3,243)	$51,989.7	$1,242,884.3		$0.025
21	0.3251	161,337.3	$52,450.8	$4,033	($3,227)	$53,257.4	$1,296,141.7		$0.025
22	0.3349	160,530.6	$53,754.2	$4,013	($3,211)	$54,556.8	$1,350,698.6		$0.025
23	0.3449	159,727.9	$55,089.9	$3,993	($3,195)	$55,888.6	$1,406,587.1		$0.025
24	0.3552	158,929.3	$56,458.9	$3,973	($3,179)	$57,253.6	$1,463,840.7		$0.025
25	0.3659	158,134.7	$57,861.9	$3,953	($3,163)	$58,652.6	$1,522,493.3		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Franklin Elementary School
Design Goal: Provide
123% Westfield High Sc 0.18 302300 1261778

Existing Conditons

Average Annual Electrical Usage (kWh)	193,479
Current Utility Price ($/kWh)	0.19
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	200
Roof Space Needed (sq-ft)	20,000.00
Annual Solar kWh (PV Watts)	237,800
Net System installation Cost ($6/kWh)	$1,200,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$1,300,000**
Materials	$910,000
Labor	$390,000
Engineers Opinion of Probable Cost	$1,625,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1900	237,800.0	$45,182.0	$43,410	($4,756)	$83,836.4	$83,836.4	$0.183	
2	0.1957	236,611.0	$46,304.8	$43,193	($4,732)	$84,765.9	$168,602.3	$0.183	
3	0.2016	235,427.9	$47,455.4	$42,977	($4,709)	$85,724.3	$254,326.5	$0.183	
4	0.2076	234,250.8	$48,634.7	$42,762	($4,685)	$86,712.2	$341,038.7	$0.183	
5	0.2138	233,079.6	$49,843.3	$42,549	($4,662)	$87,730.4	$428,769.1	$0.183	
6	0.2203	231,914.2	$51,081.9	$42,336	($4,638)	$88,779.5	$517,548.6	$0.183	
7	0.2269	230,754.6	$52,351.3	$42,124	($4,615)	$89,860.4	$607,409.1	$0.183	
8	0.2337	229,600.8	$53,652.2	$41,914	($4,592)	$90,973.8	$698,382.9	$0.183	
9	0.2407	228,452.8	$54,985.5	$41,704	($4,569)	$92,120.5	$790,503.3	$0.183	
10	0.2479	227,310.5	$56,351.9	$41,496	($4,546)	$93,301.2	$883,804.5	$0.183	
11	0.2553	226,174.0	$57,752.2	$41,288	($4,523)	$94,516.8	$978,321.3	$0.183	
12	0.2630	225,043.1	$59,187.3	$41,082	($4,501)	$95,768.1	$1,074,089.4	$0.183	
13	0.2709	223,917.9	$60,658.1	$40,876	($4,478)	$97,056.0	$1,171,145.4	$0.183	
14	0.2790	222,798.3	$62,165.5	$40,672	($4,456)	$98,381.4	$1,269,526.8	$0.183	
15	0.2874	221,684.3	$63,710.3	$40,468	($4,434)	$99,745.1	$1,369,271.9	$0.183	
16	0.2960	220,575.9	$65,293.5	$5,514	($4,412)	$66,396.4	$1,435,668.3		$0.025
17	0.3049	219,473.0	$66,916.1	$5,487	($4,389)	$68,013.4	$1,503,681.7		$0.025
18	0.3140	218,375.7	$68,578.9	$5,459	($4,368)	$69,670.8	$1,573,352.5		$0.025
19	0.3235	217,283.8	$70,283.1	$5,432	($4,346)	$71,369.5	$1,644,722.0		$0.025
20	0.3332	216,197.4	$72,029.6	$5,405	($4,324)	$73,110.6	$1,717,832.6		$0.025
21	0.3432	215,116.4	$73,819.6	$5,378	($4,302)	$74,895.2	$1,792,727.8		$0.025
22	0.3535	214,040.8	$75,654.0	$5,351	($4,281)	$76,724.2	$1,869,452.0		$0.025
23	0.3641	212,970.6	$77,534.0	$5,324	($4,259)	$78,598.8	$1,948,050.8		$0.025
24	0.3750	211,905.7	$79,460.7	$5,298	($4,238)	$80,520.2	$2,028,571.1		$0.025
25	0.3862	210,846.2	$81,435.3	$5,271	($4,217)	$82,489.5	$2,111,060.6		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Jefferson Elementary School
Design Goal: Provide
102% Westfield High S(0.18 302300 1261778

Existing Conditons

Average Annual Electrical Usage (kWh)	175,337
Current Utility Price ($/kWh)	0.18
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	150
Roof Space Needed (sq-ft)	15,000.00
Annual Solar kWh (PV Watts)	178,350
Net System installation Cost ($6/kWh)	$900,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$1,000,000**
Materials	$700,000
Labor	$300,000
Engineers Opinion of Probable Cost	$1,250,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1800	178,350.0	$32,103.0	$32,558	($3,567)	$61,093.8	$61,093.8	$0.183	
2	0.1854	177,458.3	$32,900.8	$32,395	($3,549)	$61,746.6	$122,840.4	$0.183	
3	0.1910	176,571.0	$33,718.3	$32,233	($3,531)	$62,420.0	$185,260.3	$0.183	
4	0.1967	175,688.1	$34,556.2	$32,072	($3,514)	$63,114.3	$248,374.7	$0.183	
5	0.2026	174,809.7	$35,415.0	$31,912	($3,496)	$63,830.3	$312,205.0	$0.183	
6	0.2087	173,935.6	$36,295.0	$31,752	($3,479)	$64,568.3	$376,773.2	$0.183	
7	0.2149	173,065.9	$37,197.0	$31,593	($3,461)	$65,328.8	$442,102.1	$0.183	
8	0.2214	172,200.6	$38,121.3	$31,435	($3,444)	$66,112.5	$508,214.6	$0.183	
9	0.2280	171,339.6	$39,068.6	$31,278	($3,427)	$66,919.9	$575,134.4	$0.183	
10	0.2349	170,482.9	$40,039.5	$31,122	($3,410)	$67,751.5	$642,885.9	$0.183	
11	0.2419	169,630.5	$41,034.5	$30,966	($3,393)	$68,607.9	$711,493.8	$0.183	
12	0.2492	168,782.3	$42,054.2	$30,811	($3,376)	$69,489.7	$780,983.5	$0.183	
13	0.2566	167,938.4	$43,099.2	$30,657	($3,359)	$70,397.6	$851,381.1	$0.183	
14	0.2643	167,098.7	$44,170.2	$30,504	($3,342)	$71,332.1	$922,713.3	$0.183	
15	0.2723	166,263.2	$45,267.9	$30,351	($3,325)	$72,293.9	$995,007.2	$0.183	
16	0.2804	165,431.9	$46,392.8	$4,136	($3,309)	$47,219.9	$1,042,227.1		$0.025
17	0.2888	164,604.8	$47,545.6	$4,115	($3,292)	$48,368.6	$1,090,595.8		$0.025
18	0.2975	163,781.7	$48,727.1	$4,095	($3,276)	$49,546.0	$1,140,141.8		$0.025
19	0.3064	162,962.8	$49,938.0	$4,074	($3,259)	$50,752.8	$1,190,894.6		$0.025
20	0.3156	162,148.0	$51,179.0	$4,054	($3,243)	$51,989.7	$1,242,884.3		$0.025
21	0.3251	161,337.3	$52,450.8	$4,033	($3,227)	$53,257.4	$1,296,141.7		$0.025
22	0.3349	160,530.6	$53,754.2	$4,013	($3,211)	$54,556.8	$1,350,698.6		$0.025
23	0.3449	159,727.9	$55,089.9	$3,993	($3,195)	$55,888.6	$1,406,587.1		$0.025
24	0.3552	158,929.3	$56,458.9	$3,973	($3,179)	$57,253.6	$1,463,840.7		$0.025
25	0.3659	158,134.7	$57,861.9	$3,953	($3,163)	$58,652.6	$1,522,493.3		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Lincoln Elementary School
Design Goal: Provide
41% Westfield High S 0.18 302300 1261778

Existing Conditons

Average Annual Electrical Usage (kWh)	289,160
Current Utility Price ($/kWh)	0.18
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	100
Roof Space Needed (sq-ft)	10,000.00
Annual Solar kWh (PV Watts)	118,900
Net System installation Cost ($6/kWh)	$600,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$700,000**
Materials	$490,000
Labor	$210,000
Engineers Opinion of Probable Cost	$875,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1800	118,900.0	$21,402.0	$21,705	($2,378)	$40,729.2	$40,729.2	$0.183	
2	0.1854	118,305.5	$21,933.8	$21,597	($2,366)	$41,164.4	$81,893.6	$0.183	
3	0.1910	117,714.0	$22,478.9	$21,489	($2,354)	$41,613.3	$123,506.9	$0.183	
4	0.1967	117,125.4	$23,037.5	$21,381	($2,343)	$42,076.2	$165,583.1	$0.183	
5	0.2026	116,539.8	$23,610.0	$21,274	($2,331)	$42,553.5	$208,136.6	$0.183	
6	0.2087	115,957.1	$24,196.7	$21,168	($2,319)	$43,045.5	$251,182.2	$0.183	
7	0.2149	115,377.3	$24,798.0	$21,062	($2,308)	$43,552.6	$294,734.7	$0.183	
8	0.2214	114,800.4	$25,414.2	$20,957	($2,296)	$44,075.0	$338,809.7	$0.183	
9	0.2280	114,226.4	$26,045.7	$20,852	($2,285)	$44,613.2	$383,423.0	$0.183	
10	0.2349	113,655.3	$26,693.0	$20,748	($2,273)	$45,167.6	$428,590.6	$0.183	
11	0.2419	113,087.0	$27,356.3	$20,644	($2,262)	$45,738.6	$474,329.2	$0.183	
12	0.2492	112,521.6	$28,036.1	$20,541	($2,250)	$46,326.5	$520,655.7	$0.183	
13	0.2566	111,959.0	$28,732.8	$20,438	($2,239)	$46,931.7	$567,587.4	$0.183	
14	0.2643	111,399.2	$29,446.8	$20,336	($2,228)	$47,554.7	$615,142.2	$0.183	
15	0.2723	110,842.2	$30,178.6	$20,234	($2,217)	$48,196.0	$663,338.1	$0.183	
16	0.2804	110,288.0	$30,928.5	$2,757	($2,206)	$31,479.9	$694,818.1		$0.025
17	0.2888	109,736.5	$31,697.1	$2,743	($2,195)	$32,245.8	$727,063.8		$0.025
18	0.2975	109,187.8	$32,484.8	$2,730	($2,184)	$33,030.7	$760,094.5		$0.025
19	0.3064	108,641.9	$33,292.0	$2,716	($2,173)	$33,835.2	$793,929.7		$0.025
20	0.3156	108,098.7	$34,119.3	$2,702	($2,162)	$34,659.8	$828,589.5		$0.025
21	0.3251	107,558.2	$34,967.2	$2,689	($2,151)	$35,505.0	$864,094.5		$0.025
22	0.3349	107,020.4	$35,836.1	$2,676	($2,140)	$36,371.2	$900,465.7		$0.025
23	0.3449	106,485.3	$36,726.6	$2,662	($2,130)	$37,259.1	$937,724.8		$0.025
24	0.3552	105,952.9	$37,639.3	$2,649	($2,119)	$38,169.1	$975,893.8		$0.025
25	0.3659	105,423.1	$38,574.6	$2,636	($2,108)	$39,101.7	$1,014,995.5		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

McKinley Elementary School
Design Goal: Provide
53% Westfield High Scl 0.18 302300 1261778

Existing Conditons

Average Annual Electrical Usage (kWh)	169,030
Current Utility Price ($/kWh)	0.17
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	75
Roof Space Needed (sq-ft)	7,500.00
Annual Solar kWh (PV Watts)	89,175
Net System installation Cost ($6/kWh)	$450,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$550,000**
Materials	$385,000
Labor	$165,000
Engineers Opinion of Probable Cost	$687,500

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1700	89,175.0	$15,159.8	$16,279	($1,784)	$29,655.1	$29,655.1	$0.183	
2	0.1751	88,729.1	$15,536.5	$16,198	($1,775)	$29,959.4	$59,614.5	$0.183	
3	0.1804	88,285.5	$15,922.6	$16,117	($1,766)	$30,273.4	$89,887.9	$0.183	
4	0.1858	87,844.1	$16,318.2	$16,036	($1,757)	$30,597.3	$120,485.2	$0.183	
5	0.1913	87,404.8	$16,723.7	$15,956	($1,748)	$30,931.4	$151,416.6	$0.183	
6	0.1971	86,967.8	$17,139.3	$15,876	($1,739)	$31,275.9	$182,692.5	$0.183	
7	0.2030	86,533.0	$17,565.2	$15,797	($1,731)	$31,631.2	$214,323.7	$0.183	
8	0.2091	86,100.3	$18,001.7	$15,718	($1,722)	$31,997.3	$246,321.0	$0.183	
9	0.2154	85,669.8	$18,449.1	$15,639	($1,713)	$32,374.7	$278,695.7	$0.183	
10	0.2218	85,241.5	$18,907.5	$15,561	($1,705)	$32,763.5	$311,459.2	$0.183	
11	0.2285	84,815.2	$19,377.4	$15,483	($1,696)	$33,164.1	$344,623.3	$0.183	
12	0.2353	84,391.2	$19,858.9	$15,406	($1,688)	$33,576.7	$378,200.0	$0.183	
13	0.2424	83,969.2	$20,352.4	$15,329	($1,679)	$34,001.6	$412,201.6	$0.183	
14	0.2497	83,549.4	$20,858.2	$15,252	($1,671)	$34,439.1	$446,640.7	$0.183	
15	0.2571	83,131.6	$21,376.5	$15,176	($1,663)	$34,889.5	$481,530.3	$0.183	
16	0.2649	82,716.0	$21,907.7	$2,068	($1,654)	$22,321.3	$503,851.5		$0.025
17	0.2728	82,302.4	$22,452.1	$2,058	($1,646)	$22,863.6	$526,715.1		$0.025
18	0.2810	81,890.9	$23,010.0	$2,047	($1,638)	$23,419.5	$550,134.6		$0.025
19	0.2894	81,481.4	$23,581.8	$2,037	($1,630)	$23,989.2	$574,123.9		$0.025
20	0.2981	81,074.0	$24,167.8	$2,027	($1,621)	$24,573.2	$598,697.1		$0.025
21	0.3070	80,668.6	$24,768.4	$2,017	($1,613)	$25,171.8	$623,868.8		$0.025
22	0.3163	80,265.3	$25,383.9	$2,007	($1,605)	$25,785.2	$649,654.1		$0.025
23	0.3257	79,864.0	$26,014.7	$1,997	($1,597)	$26,414.0	$676,068.1		$0.025
24	0.3355	79,464.7	$26,661.2	$1,987	($1,589)	$27,058.5	$703,126.6		$0.025
25	0.3456	79,067.3	$27,323.7	$1,977	($1,581)	$27,719.0	$730,845.6		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Tamaques Elementary School

Existing Conditons

Average Annual Electrical Usage (kWh)	173,409
Current Utility Price ($/kWh)	0.18
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	100
Roof Space Needed (sq-ft)	10,000.00
Annual Solar kWh (PV Watts)	118,900
Net System installation Cost ($6/kWh)	$600,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$700,000**
Materials	$490,000
Labor	$210,000
Engineers Opinion of Probable Cost	$875,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1800	118,900.0	$21,402.0	$21,705	($2,378)	$40,729.2	$40,729.2	$0.183	
2	0.1854	118,305.5	$21,933.8	$21,597	($2,366)	$41,164.4	$81,893.6	$0.183	
3	0.1910	117,714.0	$22,478.9	$21,489	($2,354)	$41,613.3	$123,506.9	$0.183	
4	0.1967	117,125.4	$23,037.5	$21,381	($2,343)	$42,076.2	$165,583.1	$0.183	
5	0.2026	116,539.8	$23,610.0	$21,274	($2,331)	$42,553.5	$208,136.6	$0.183	
6	0.2087	115,957.1	$24,196.7	$21,168	($2,319)	$43,045.5	$251,182.2	$0.183	
7	0.2149	115,377.3	$24,798.0	$21,062	($2,308)	$43,552.6	$294,734.7	$0.183	
8	0.2214	114,800.4	$25,414.2	$20,957	($2,296)	$44,075.0	$338,809.7	$0.183	
9	0.2280	114,226.4	$26,045.7	$20,852	($2,285)	$44,613.2	$383,423.0	$0.183	
10	0.2349	113,655.3	$26,693.0	$20,748	($2,273)	$45,167.6	$428,590.6	$0.183	
11	0.2419	113,087.0	$27,356.3	$20,644	($2,262)	$45,738.6	$474,329.2	$0.183	
12	0.2492	112,521.6	$28,036.1	$20,541	($2,250)	$46,326.5	$520,655.7	$0.183	
13	0.2566	111,959.0	$28,732.8	$20,438	($2,239)	$46,931.7	$567,587.4	$0.183	
14	0.2643	111,399.2	$29,446.8	$20,336	($2,228)	$47,554.7	$615,142.2	$0.183	
15	0.2723	110,842.2	$30,178.6	$20,234	($2,217)	$48,196.0	$663,338.1	$0.183	
16	0.2804	110,288.0	$30,928.5	$2,757	($2,206)	$31,479.9	$694,818.1		$0.025
17	0.2888	109,736.5	$31,697.1	$2,743	($2,195)	$32,245.8	$727,063.8		$0.025
18	0.2975	109,187.8	$32,484.8	$2,730	($2,184)	$33,030.7	$760,094.5		$0.025
19	0.3064	108,641.9	$33,292.0	$2,716	($2,173)	$33,835.2	$793,929.7		$0.025
20	0.3156	108,098.7	$34,119.3	$2,702	($2,162)	$34,659.8	$828,589.5		$0.025
21	0.3251	107,558.2	$34,967.2	$2,689	($2,151)	$35,505.0	$864,094.5		$0.025
22	0.3349	107,020.4	$35,836.1	$2,676	($2,140)	$36,371.2	$900,465.7		$0.025
23	0.3449	106,485.3	$36,726.6	$2,662	($2,130)	$37,259.1	$937,724.8		$0.025
24	0.3552	105,952.9	$37,639.3	$2,649	($2,119)	$38,169.1	$975,893.8		$0.025
25	0.3659	105,423.1	$38,574.6	$2,636	($2,108)	$39,101.7	$1,014,995.5		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Washington Elementary School
Design Goal: Provide
39% of average annual electricity

Existing Conditons

Average Annual Electrical Usage (kWh)	153,766
Current Utility Price ($/kWh)	0.19
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	50
Roof Space Needed (sq-ft)	5,000.00
Annual Solar kWh (PV Watts)	59,450
Net System installation Cost ($6/kWh)	$300,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$400,000**
Materials	$280,000
Labor	$120,000
Engineers Opinion of Probable Cost	$500,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1900	59,450.0	$11,295.5	$10,853	($1,189)	$20,959.1	$20,959.1	$0.183	
2	0.1957	59,152.8	$11,576.2	$10,798	($1,183)	$21,191.5	$42,150.6	$0.183	
3	0.2016	58,857.0	$11,863.9	$10,744	($1,177)	$21,431.1	$63,581.6	$0.183	
4	0.2076	58,562.7	$12,158.7	$10,691	($1,171)	$21,678.0	$85,259.7	$0.183	
5	0.2138	58,269.9	$12,460.8	$10,637	($1,165)	$21,932.6	$107,192.3	$0.183	
6	0.2203	57,978.5	$12,770.5	$10,584	($1,160)	$22,194.9	$129,387.2	$0.183	
7	0.2269	57,688.6	$13,087.8	$10,531	($1,154)	$22,465.1	$151,852.3	$0.183	
8	0.2337	57,400.2	$13,413.1	$10,478	($1,148)	$22,743.5	$174,595.7	$0.183	
9	0.2407	57,113.2	$13,746.4	$10,426	($1,142)	$23,030.1	$197,625.8	$0.183	
10	0.2479	56,827.6	$14,088.0	$10,374	($1,137)	$23,325.3	$220,951.1	$0.183	
11	0.2553	56,543.5	$14,438.0	$10,322	($1,131)	$23,629.2	$244,580.3	$0.183	
12	0.2630	56,260.8	$14,796.8	$10,270	($1,125)	$23,942.0	$268,522.4	$0.183	
13	0.2709	55,979.5	$15,164.5	$10,219	($1,120)	$24,264.0	$292,786.4	$0.183	
14	0.2790	55,699.6	$15,541.4	$10,168	($1,114)	$24,595.3	$317,381.7	$0.183	
15	0.2874	55,421.1	$15,927.6	$10,117	($1,108)	$24,936.3	$342,318.0	$0.183	
16	0.2960	55,144.0	$16,323.4	$1,379	($1,103)	$16,599.1	$358,917.1		$0.025
17	0.3049	54,868.3	$16,729.0	$1,372	($1,097)	$17,003.4	$375,920.4		$0.025
18	0.3140	54,593.9	$17,144.7	$1,365	($1,092)	$17,417.7	$393,338.1		$0.025
19	0.3235	54,320.9	$17,570.8	$1,358	($1,086)	$17,842.4	$411,180.5		$0.025
20	0.3332	54,049.3	$18,007.4	$1,351	($1,081)	$18,277.7	$429,458.2		$0.025
21	0.3432	53,779.1	$18,454.9	$1,344	($1,076)	$18,723.8	$448,181.9		$0.025
22	0.3535	53,510.2	$18,913.5	$1,338	($1,070)	$19,181.0	$467,363.0		$0.025
23	0.3641	53,242.6	$19,383.5	$1,331	($1,065)	$19,649.7	$487,012.7		$0.025
24	0.3750	52,976.4	$19,865.2	$1,324	($1,060)	$20,130.1	$507,142.8		$0.025
25	0.3862	52,711.6	$20,358.8	$1,318	($1,054)	$20,622.4	$527,765.2		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Wilson Elementary School

Existing Conditons

Average Annual Electrical Usage (kWh)	176,446
Current Utility Price ($/kWh)	0.19
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	50
Roof Space Needed (sq-ft)	5,000.00
Annual Solar kWh (PV Watts)	59,450
Net System installation Cost ($6/kWh)	$300,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$400,000**
Materials	$280,000
Labor	$120,000
Engineers Opinion of Probable Cost	$500,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1900	59,450.0	$11,295.5	$10,853	($1,189)	$20,959.1	$20,959.1	$0.183	
2	0.1957	59,152.8	$11,576.2	$10,798	($1,183)	$21,191.5	$42,150.6	$0.183	
3	0.2016	58,857.0	$11,863.9	$10,744	($1,177)	$21,431.1	$63,581.6	$0.183	
4	0.2076	58,562.7	$12,158.7	$10,691	($1,171)	$21,678.0	$85,259.7	$0.183	
5	0.2138	58,269.9	$12,460.8	$10,637	($1,165)	$21,932.6	$107,192.3	$0.183	
6	0.2203	57,978.5	$12,770.5	$10,584	($1,160)	$22,194.9	$129,387.2	$0.183	
7	0.2269	57,688.6	$13,087.8	$10,531	($1,154)	$22,465.1	$151,852.3	$0.183	
8	0.2337	57,400.2	$13,413.1	$10,478	($1,148)	$22,743.5	$174,595.7	$0.183	
9	0.2407	57,113.2	$13,746.4	$10,426	($1,142)	$23,030.1	$197,625.8	$0.183	
10	0.2479	56,827.6	$14,088.0	$10,374	($1,137)	$23,325.3	$220,951.1	$0.183	
11	0.2553	56,543.5	$14,438.0	$10,322	($1,131)	$23,629.2	$244,580.3	$0.183	
12	0.2630	56,260.8	$14,796.8	$10,270	($1,125)	$23,942.0	$268,522.4	$0.183	
13	0.2709	55,979.5	$15,164.5	$10,219	($1,120)	$24,264.0	$292,786.4	$0.183	
14	0.2790	55,699.6	$15,541.4	$10,168	($1,114)	$24,595.3	$317,381.7	$0.183	
15	0.2874	55,421.1	$15,927.6	$10,117	($1,108)	$24,936.3	$342,318.0	$0.183	
16	0.2960	55,144.0	$16,323.4	$1,379	($1,103)	$16,599.1	$358,917.1		$0.025
17	0.3049	54,868.3	$16,729.0	$1,372	($1,097)	$17,003.4	$375,920.4		$0.025
18	0.3140	54,593.9	$17,144.7	$1,365	($1,092)	$17,417.7	$393,338.1		$0.025
19	0.3235	54,320.9	$17,570.8	$1,358	($1,086)	$17,842.4	$411,180.5		$0.025
20	0.3332	54,049.3	$18,007.4	$1,351	($1,081)	$18,277.7	$429,458.2		$0.025
21	0.3432	53,779.1	$18,454.9	$1,344	($1,076)	$18,723.8	$448,181.9		$0.025
22	0.3535	53,510.2	$18,913.5	$1,338	($1,070)	$19,181.0	$467,363.0		$0.025
23	0.3641	53,242.6	$19,383.5	$1,331	($1,065)	$19,649.7	$487,012.7		$0.025
24	0.3750	52,976.4	$19,865.2	$1,324	($1,060)	$20,130.1	$507,142.8		$0.025
25	0.3862	52,711.6	$20,358.8	$1,318	($1,054)	$20,622.4	$527,765.2		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Administration Building

Existing Conditons

Average Annual Electrical Usage (kWh)	153,480
Current Utility Price ($/kWh)	0.18
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	50
Roof Space Needed (sq-ft)	5,000.00
Annual Solar kWh (PV Watts)	59,450
Net System installation Cost ($6/kWh)	$300,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$400,000**
Materials	$280,000
Labor	$120,000
Engineers Opinion of Probable Cost	$500,000

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1800	59,450.0	$10,701.0	$10,853	($1,189)	$20,364.6	$20,364.6	$0.183	
2	0.1854	59,152.8	$10,966.9	$10,798	($1,183)	$20,582.2	$40,946.8	$0.183	
3	0.1910	58,857.0	$11,239.4	$10,744	($1,177)	$20,806.7	$61,753.4	$0.183	
4	0.1967	58,562.7	$11,518.7	$10,691	($1,171)	$21,038.1	$82,791.6	$0.183	
5	0.2026	58,269.9	$11,805.0	$10,637	($1,165)	$21,276.8	$104,068.3	$0.183	
6	0.2087	57,978.5	$12,098.3	$10,584	($1,160)	$21,522.8	$125,591.1	$0.183	
7	0.2149	57,688.6	$12,399.0	$10,531	($1,154)	$21,776.3	$147,367.4	$0.183	
8	0.2214	57,400.2	$12,707.1	$10,478	($1,148)	$22,037.5	$169,404.9	$0.183	
9	0.2280	57,113.2	$13,022.9	$10,426	($1,142)	$22,306.6	$191,711.5	$0.183	
10	0.2349	56,827.6	$13,346.5	$10,374	($1,137)	$22,583.8	$214,295.3	$0.183	
11	0.2419	56,543.5	$13,678.2	$10,322	($1,131)	$22,869.3	$237,164.6	$0.183	
12	0.2492	56,260.8	$14,018.1	$10,270	($1,125)	$23,163.2	$260,327.8	$0.183	
13	0.2566	55,979.5	$14,366.4	$10,219	($1,120)	$23,465.9	$283,793.7	$0.183	
14	0.2643	55,699.6	$14,723.4	$10,168	($1,114)	$23,777.4	$307,571.1	$0.183	
15	0.2723	55,421.1	$15,089.3	$10,117	($1,108)	$24,098.0	$331,669.1	$0.183	
16	0.2804	55,144.0	$15,464.3	$1,379	($1,103)	$15,740.0	$347,409.0		$0.025
17	0.2888	54,868.3	$15,848.5	$1,372	($1,097)	$16,122.9	$363,531.9		$0.025
18	0.2975	54,593.9	$16,242.4	$1,365	($1,092)	$16,515.3	$380,047.3		$0.025
19	0.3064	54,320.9	$16,646.0	$1,358	($1,086)	$16,917.6	$396,964.9		$0.025
20	0.3156	54,049.3	$17,059.7	$1,351	($1,081)	$17,329.9	$414,294.8		$0.025
21	0.3251	53,779.1	$17,483.6	$1,344	($1,076)	$17,752.5	$432,047.2		$0.025
22	0.3349	53,510.2	$17,918.1	$1,338	($1,070)	$18,185.6	$450,232.9		$0.025
23	0.3449	53,242.6	$18,363.3	$1,331	($1,065)	$18,629.5	$468,862.4		$0.025
24	0.3552	52,976.4	$18,819.6	$1,324	($1,060)	$19,084.5	$487,946.9		$0.025
25	0.3659	52,711.6	$19,287.3	$1,318	($1,054)	$19,550.9	$507,497.8		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

Kehler Stadium Field House

Existing Conditons

Average Annual Electrical Usage (kWh)	34,842
Current Utility Price ($/kWh)	0.18
Actual SREC Market Values (January 2010-Present)	$110/MWh - $700/MWh

Calculations

Solar Rating - Zip Code: 7040	4.50 kWh/sq-m/day
Solar Capacity Required (kW)	5
Roof Space Needed (sq-ft)	500.00
Annual Solar kWh (PV Watts)	5,945
Net System installation Cost ($6/kWh)	$30,000
Electrical Service Modification Cost	$100,000
Total System Installation Cost	**$130,000**
Materials	$91,000
Labor	$39,000
Engineers Opinion of Probable Cost	$162,500

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	2%

Year	Utility Price	Solar kWh	Utility Savings	SRECS	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow	SREC Factor ($/kWh)*	REC Factor ($/kWh)
Install									
1	0.1800	5,945.0	$1,070.1	$1,085	($119)	$2,036.5	$2,036.5	$0.183	
2	0.1854	5,915.3	$1,096.7	$1,080	($118)	$2,058.2	$4,094.7	$0.183	
3	0.1910	5,885.7	$1,123.9	$1,074	($118)	$2,080.7	$6,175.3	$0.183	
4	0.1967	5,856.3	$1,151.9	$1,069	($117)	$2,103.8	$8,279.2	$0.183	
5	0.2026	5,827.0	$1,180.5	$1,064	($117)	$2,127.7	$10,406.8	$0.183	
6	0.2087	5,797.9	$1,209.8	$1,058	($116)	$2,152.3	$12,559.1	$0.183	
7	0.2149	5,768.9	$1,239.9	$1,053	($115)	$2,177.6	$14,736.7	$0.183	
8	0.2214	5,740.0	$1,270.7	$1,048	($115)	$2,203.8	$16,940.5	$0.183	
9	0.2280	5,711.3	$1,302.3	$1,043	($114)	$2,230.7	$19,171.1	$0.183	
10	0.2349	5,682.8	$1,334.6	$1,037	($114)	$2,258.4	$21,429.5	$0.183	
11	0.2419	5,654.3	$1,367.8	$1,032	($113)	$2,286.9	$23,716.5	$0.183	
12	0.2492	5,626.1	$1,401.8	$1,027	($113)	$2,316.3	$26,032.8	$0.183	
13	0.2566	5,597.9	$1,436.6	$1,022	($112)	$2,346.6	$28,379.4	$0.183	
14	0.2643	5,570.0	$1,472.3	$1,017	($111)	$2,377.7	$30,757.1	$0.183	
15	0.2723	5,542.1	$1,508.9	$1,012	($111)	$2,409.8	$33,166.9	$0.183	
16	0.2804	5,514.4	$1,546.4	$138	($110)	$1,574.0	$34,740.9		$0.025
17	0.2888	5,486.8	$1,584.9	$137	($110)	$1,612.3	$36,353.2		$0.025
18	0.2975	5,459.4	$1,624.2	$136	($109)	$1,651.5	$38,004.7		$0.025
19	0.3064	5,432.1	$1,664.6	$136	($109)	$1,691.8	$39,696.5		$0.025
20	0.3156	5,404.9	$1,706.0	$135	($108)	$1,733.0	$41,429.5		$0.025
21	0.3251	5,377.9	$1,748.4	$134	($108)	$1,775.2	$43,204.7		$0.025
22	0.3349	5,351.0	$1,791.8	$134	($107)	$1,818.6	$45,023.3		$0.025
23	0.3449	5,324.3	$1,836.3	$133	($106)	$1,863.0	$46,886.2		$0.025
24	0.3552	5,297.6	$1,882.0	$132	($106)	$1,908.5	$48,794.7		$0.025
25	0.3659	5,271.2	$1,928.7	$132	($105)	$1,955.1	$50,749.8		$0.025

* SREC factor is referenced from the NJBPU Solar Alternative Compliance Payment (SACP) schedule.

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%

O&M inflation: 3%

Westfield High School					**Edison Intermediate School**					**Roosevelt Intermediate School**				
Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow	Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow	Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow
0				($1,625,000)	0				($687,500)	0				($1,250,000)
1	$42,804.0	$43,410	($4,756)	$81,458	1	$14,268.0	$16,279	($1,784)	$28,763	1	$32,103.0	$32,558	($3,567)	$61,094
2	$43,867.7	$43,193	($4,732)	$82,329	2	$14,622.6	$16,198	($1,775)	$29,045	2	$32,900.8	$32,395	($3,549)	$61,747
3	$44,957.8	$42,977	($4,709)	$83,227	3	$14,985.9	$16,117	($1,766)	$29,337	3	$33,718.3	$32,233	($3,531)	$62,420
4	$46,075.0	$42,762	($4,685)	$84,152	4	$15,358.3	$16,036	($1,757)	$29,637	4	$34,556.2	$32,072	($3,514)	$63,114
5	$47,220.0	$42,549	($4,662)	$85,107	5	$15,740.0	$15,956	($1,748)	$29,948	5	$35,415.0	$31,912	($3,496)	$63,830
6	$48,393.4	$42,336	($4,638)	$86,091	6	$16,131.1	$15,876	($1,739)	$30,268	6	$36,295.0	$31,752	($3,479)	$64,568
7	$49,595.9	$42,124	($4,615)	$87,105	7	$16,532.0	$15,797	($1,731)	$30,598	7	$37,197.0	$31,593	($3,461)	$65,329
8	$50,828.4	$41,914	($4,592)	$88,150	8	$16,942.8	$15,718	($1,722)	$30,938	8	$38,121.3	$31,435	($3,444)	$66,113
9	$52,091.5	$41,704	($4,569)	$89,226	9	$17,363.8	$15,639	($1,713)	$31,289	9	$39,068.6	$31,278	($3,427)	$66,920
10	$53,386.0	$41,496	($4,546)	$90,335	10	$17,795.3	$15,561	($1,705)	$31,651	10	$40,039.5	$31,122	($3,410)	$67,751
11	$54,712.6	$41,288	($4,523)	$91,477	11	$18,237.5	$15,483	($1,696)	$32,024	11	$41,034.5	$30,966	($3,393)	$68,608
12	$56,072.2	$41,082	($4,501)	$92,653	12	$18,690.7	$15,406	($1,688)	$32,409	12	$42,054.2	$30,811	($3,376)	$69,490
13	$57,465.6	$40,876	($4,478)	$93,863	13	$19,155.2	$15,329	($1,679)	$32,804	13	$43,099.2	$30,657	($3,359)	$70,398
14	$58,893.6	$40,672	($4,456)	$95,109	14	$19,631.2	$15,252	($1,671)	$33,212	14	$44,170.2	$30,504	($3,342)	$71,332
15	$60,357.1	$40,468	($4,434)	$96,392	15	$20,119.0	$15,176	($1,663)	$33,632	15	$45,267.9	$30,351	($3,325)	$72,294
16	$61,857.0	$5,514	($4,412)	$62,960	16	$20,619.0	$2,068	($1,654)	$21,033	16	$46,392.8	$4,136	($3,309)	$47,220
17	$63,394.2	$5,487	($4,389)	$64,492	17	$21,131.4	$2,058	($1,646)	$21,543	17	$47,545.6	$4,115	($3,292)	$48,369
18	$64,969.5	$5,459	($4,368)	$66,061	18	$21,656.5	$2,047	($1,638)	$22,066	18	$48,727.1	$4,095	($3,276)	$49,546
19	$66,584.0	$5,432	($4,346)	$67,670	19	$22,194.7	$2,037	($1,630)	$22,602	19	$49,938.0	$4,074	($3,259)	$50,753
20	$68,238.6	$5,405	($4,324)	$69,320	20	$22,746.2	$2,027	($1,621)	$23,152	20	$51,179.0	$4,054	($3,243)	$51,990
21	$69,934.3	$5,378	($4,302)	$71,010	21	$23,311.4	$2,017	($1,613)	$23,715	21	$52,450.8	$4,033	($3,227)	$53,257
22	$71,672.2	$5,351	($4,281)	$72,742	22	$23,890.7	$2,007	($1,605)	$24,292	22	$53,754.2	$4,013	($3,211)	$54,557
23	$73,453.3	$5,324	($4,259)	$74,518	23	$24,484.4	$1,997	($1,597)	$24,884	23	$55,089.9	$3,993	($3,195)	$55,889
24	$75,278.6	$5,298	($4,238)	$76,338	24	$25,092.9	$1,987	($1,589)	$25,490	24	$56,458.9	$3,973	($3,179)	$57,254
25	$77,149.2	$5,271	($4,217)	$78,203	25	$25,716.4	$1,977	($1,581)	$26,112	25	$57,861.9	$3,953	($3,163)	$58,653
			IRR	1.86%				IRR	0.15%				IRR	1.64%
			NPV	($193,290.53)				NPV	($191,397.34)				NPV	($176,217.90)
			AROI	1.01%				AROI	0.18%				AROI	0.89%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%

O&M inflation: 3%

Franklin Elementary School					**Jefferson Elementary School**					**Lincoln Elementary School**				
Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow	Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow	Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow
0				($1,625,000)	0				($1,250,000)	0				($875,000)
1	$45,182.0	$43,410	($4,756)	$83,836	1	$32,103.0	$32,558	($3,567)	$61,094	1	$21,402.0	$21,705	($2,378)	$40,729
2	$46,304.8	$43,193	($4,732)	$84,766	2	$32,900.8	$32,395	($3,549)	$61,747	2	$21,933.8	$21,597	($2,366)	$41,164
3	$47,455.4	$42,977	($4,709)	$85,724	3	$33,718.3	$32,233	($3,531)	$62,420	3	$22,478.9	$21,489	($2,354)	$41,613
4	$48,634.7	$42,762	($4,685)	$86,712	4	$34,556.2	$32,072	($3,514)	$63,114	4	$23,037.5	$21,381	($2,343)	$42,076
5	$49,843.3	$42,549	($4,662)	$87,730	5	$35,415.0	$31,912	($3,496)	$63,830	5	$23,610.0	$21,274	($2,331)	$42,554
6	$51,081.9	$42,336	($4,638)	$88,780	6	$36,295.0	$31,752	($3,479)	$64,568	6	$24,196.7	$21,168	($2,319)	$43,046
7	$52,351.3	$42,124	($4,615)	$89,860	7	$37,197.0	$31,593	($3,461)	$65,329	7	$24,798.0	$21,062	($2,308)	$43,553
8	$53,652.2	$41,914	($4,592)	$90,974	8	$38,121.3	$31,435	($3,444)	$66,113	8	$25,414.2	$20,957	($2,296)	$44,075
9	$54,985.5	$41,704	($4,569)	$92,120	9	$39,068.6	$31,278	($3,427)	$66,920	9	$26,045.7	$20,852	($2,285)	$44,613
10	$56,351.9	$41,496	($4,546)	$93,301	10	$40,039.5	$31,122	($3,410)	$67,751	10	$26,693.0	$20,748	($2,273)	$45,168
11	$57,752.2	$41,288	($4,523)	$94,517	11	$41,034.5	$30,966	($3,393)	$68,608	11	$27,356.3	$20,644	($2,262)	$45,739
12	$59,187.3	$41,082	($4,501)	$95,768	12	$42,054.2	$30,811	($3,376)	$69,490	12	$28,036.1	$20,541	($2,250)	$46,326
13	$60,658.1	$40,876	($4,478)	$97,056	13	$43,099.2	$30,657	($3,359)	$70,398	13	$28,732.8	$20,438	($2,239)	$46,932
14	$62,165.5	$40,672	($4,456)	$98,381	14	$44,170.2	$30,504	($3,342)	$71,332	14	$29,446.8	$20,336	($2,228)	$47,555
15	$63,710.3	$40,468	($4,434)	$99,745	15	$45,267.9	$30,351	($3,325)	$72,294	15	$30,178.6	$20,234	($2,217)	$48,196
16	$65,293.5	$5,514	($4,412)	$66,396	16	$46,392.8	$4,136	($3,309)	$47,220	16	$30,928.5	$2,757	($2,206)	$31,480
17	$66,916.1	$5,487	($4,389)	$68,013	17	$47,545.6	$4,115	($3,292)	$48,369	17	$31,697.1	$2,743	($2,195)	$32,246
18	$68,578.9	$5,459	($4,368)	$69,671	18	$48,727.1	$4,095	($3,276)	$49,546	18	$32,484.8	$2,730	($2,184)	$33,031
19	$70,283.1	$5,432	($4,346)	$71,370	19	$49,938.0	$4,074	($3,259)	$50,753	19	$33,292.0	$2,716	($2,173)	$33,835
20	$72,029.6	$5,405	($4,324)	$73,111	20	$51,179.0	$4,054	($3,243)	$51,990	20	$34,119.3	$2,702	($2,162)	$34,660
21	$73,819.6	$5,378	($4,302)	$74,895	21	$52,450.8	$4,033	($3,227)	$53,257	21	$34,967.2	$2,689	($2,151)	$35,505
22	$75,654.0	$5,351	($4,281)	$76,724	22	$53,754.2	$4,013	($3,211)	$54,557	22	$35,836.1	$2,676	($2,140)	$36,371
23	$77,534.0	$5,324	($4,259)	$78,599	23	$55,089.9	$3,993	($3,195)	$55,889	23	$36,726.6	$2,662	($2,130)	$37,259
24	$79,460.7	$5,298	($4,238)	$80,520	24	$56,458.9	$3,973	($3,179)	$57,254	24	$37,639.3	$2,649	($2,119)	$38,169
25	$81,435.3	$5,271	($4,217)	$82,490	25	$57,861.9	$3,953	($3,163)	$58,653	25	$38,574.6	$2,636	($2,108)	$39,102
			IRR	2.19%				IRR	1.64%				IRR	1.22%
			NPV	($138,906.01)				NPV	($176,217.90)				NPV	($159,145.26)
			AROI	1.16%				AROI	0.89%				AROI	0.65%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%

O&M inflation: 3%

McKinley Elementary School					**Tamaques Elementary School**					**Washington Elementary School**				
Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow	Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow	Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow
0				($687,500)	0				($875,000)	0				($500,000)
1	$15,159.8	$16,279	($1,784)	$29,655	1	$21,402.0	$21,705	($2,378)	$40,729	1	$11,295.5	$10,853	($1,189)	$20,959
2	$15,536.5	$16,198	($1,775)	$29,959	2	$21,933.8	$21,597	($2,366)	$41,164	2	$11,576.2	$10,798	($1,183)	$21,191
3	$15,922.6	$16,117	($1,766)	$30,273	3	$22,478.9	$21,489	($2,354)	$41,613	3	$11,863.9	$10,744	($1,177)	$21,431
4	$16,318.2	$16,036	($1,757)	$30,597	4	$23,037.5	$21,381	($2,343)	$42,076	4	$12,158.7	$10,691	($1,171)	$21,678
5	$16,723.7	$15,956	($1,748)	$30,931	5	$23,610.0	$21,274	($2,331)	$42,554	5	$12,460.8	$10,637	($1,165)	$21,933
6	$17,139.3	$15,876	($1,739)	$31,276	6	$24,196.7	$21,168	($2,319)	$43,046	6	$12,770.5	$10,584	($1,160)	$22,195
7	$17,565.2	$15,797	($1,731)	$31,631	7	$24,798.0	$21,062	($2,308)	$43,553	7	$13,087.8	$10,531	($1,154)	$22,465
8	$18,001.7	$15,718	($1,722)	$31,997	8	$25,414.2	$20,957	($2,296)	$44,075	8	$13,413.1	$10,478	($1,148)	$22,743
9	$18,449.1	$15,639	($1,713)	$32,375	9	$26,045.7	$20,852	($2,285)	$44,613	9	$13,746.4	$10,426	($1,142)	$23,030
10	$18,907.5	$15,561	($1,705)	$32,764	10	$26,693.0	$20,748	($2,273)	$45,168	10	$14,088.0	$10,374	($1,137)	$23,325
11	$19,377.4	$15,483	($1,696)	$33,164	11	$27,356.3	$20,644	($2,262)	$45,739	11	$14,438.0	$10,322	($1,131)	$23,629
12	$19,858.9	$15,406	($1,688)	$33,577	12	$28,036.1	$20,541	($2,250)	$46,326	12	$14,796.8	$10,270	($1,125)	$23,942
13	$20,352.4	$15,329	($1,679)	$34,002	13	$28,732.8	$20,438	($2,239)	$46,932	13	$15,164.5	$10,219	($1,120)	$24,264
14	$20,858.2	$15,252	($1,671)	$34,439	14	$29,446.8	$20,336	($2,228)	$47,555	14	$15,541.4	$10,168	($1,114)	$24,595
15	$21,376.5	$15,176	($1,663)	$34,890	15	$30,178.6	$20,234	($2,217)	$48,196	15	$15,927.6	$10,117	($1,108)	$24,936
16	$21,907.7	$2,068	($1,654)	$22,321	16	$30,928.5	$2,757	($2,206)	$31,480	16	$16,323.4	$1,379	($1,103)	$16,599
17	$22,452.1	$2,058	($1,646)	$22,864	17	$31,697.1	$2,743	($2,195)	$32,246	17	$16,729.0	$1,372	($1,097)	$17,003
18	$23,010.0	$2,047	($1,638)	$23,419	18	$32,484.8	$2,730	($2,184)	$33,031	18	$17,144.7	$1,365	($1,092)	$17,418
19	$23,581.8	$2,037	($1,630)	$23,989	19	$33,292.0	$2,716	($2,173)	$33,835	19	$17,570.8	$1,358	($1,086)	$17,842
20	$24,167.8	$2,027	($1,621)	$24,573	20	$34,119.3	$2,702	($2,162)	$34,660	20	$18,007.4	$1,351	($1,081)	$18,278
21	$24,768.4	$2,017	($1,613)	$25,172	21	$34,967.2	$2,689	($2,151)	$35,505	21	$18,454.9	$1,344	($1,076)	$18,724
22	$25,383.9	$2,007	($1,605)	$25,785	22	$35,836.1	$2,676	($2,140)	$36,371	22	$18,913.5	$1,338	($1,070)	$19,181
23	$26,014.7	$1,997	($1,597)	$26,414	23	$36,726.6	$2,662	($2,130)	$37,259	23	$19,383.5	$1,331	($1,065)	$19,650
24	$26,661.2	$1,987	($1,589)	$27,058	24	$37,639.3	$2,649	($2,119)	$38,169	24	$19,865.2	$1,324	($1,060)	$20,130
25	$27,323.7	$1,977	($1,581)	$27,719	25	$38,574.6	$2,636	($2,108)	$39,102	25	$20,358.8	$1,318	($1,054)	$20,622
			IRR	0.50%				IRR	1.22%				IRR	0.43%
			NPV	($171,003.14)				NPV	($159,145.26)				NPV	##########
			AROI	0.31%				AROI	0.65%				AROI	0.19%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%

O&M inflation: 3%

Wilson Elementary School					**Administration Building**					**Kehler Stadium Field House**				
Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow	Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow	Year	Energy Savings	SREC Sales	Maitenance Cost	Cash Flow
0				($500,000)	0				($500,000)	0				($162,500)
1	$11,295.5	$10,853	($1,189)	$20,959	1	$10,701.0	$10,853	($1,189)	$20,365	1	$1,070.1	$1,085	($119)	$2,036
2	$11,576.2	$10,798	($1,183)	$21,191	2	$10,966.9	$10,798	($1,183)	$20,582	2	$1,096.7	$1,080	($118)	$2,058
3	$11,863.9	$10,744	($1,177)	$21,431	3	$11,239.4	$10,744	($1,177)	$20,807	3	$1,123.9	$1,074	($118)	$2,081
4	$12,158.7	$10,691	($1,171)	$21,678	4	$11,518.7	$10,691	($1,171)	$21,038	4	$1,151.9	$1,069	($117)	$2,104
5	$12,460.8	$10,637	($1,165)	$21,933	5	$11,805.0	$10,637	($1,165)	$21,277	5	$1,180.5	$1,064	($117)	$2,128
6	$12,770.5	$10,584	($1,160)	$22,195	6	$12,098.3	$10,584	($1,160)	$21,523	6	$1,209.8	$1,058	($116)	$2,152
7	$13,087.8	$10,531	($1,154)	$22,465	7	$12,399.0	$10,531	($1,154)	$21,776	7	$1,239.9	$1,053	($115)	$2,178
8	$13,413.1	$10,478	($1,148)	$22,743	8	$12,707.1	$10,478	($1,148)	$22,038	8	$1,270.7	$1,048	($115)	$2,204
9	$13,746.4	$10,426	($1,142)	$23,030	9	$13,022.9	$10,426	($1,142)	$22,307	9	$1,302.3	$1,043	($114)	$2,231
10	$14,088.0	$10,374	($1,137)	$23,325	10	$13,346.5	$10,374	($1,137)	$22,584	10	$1,334.6	$1,037	($114)	$2,258
11	$14,438.0	$10,322	($1,131)	$23,629	11	$13,678.2	$10,322	($1,131)	$22,869	11	$1,367.8	$1,032	($113)	$2,287
12	$14,796.8	$10,270	($1,125)	$23,942	12	$14,018.1	$10,270	($1,125)	$23,163	12	$1,401.8	$1,027	($113)	$2,316
13	$15,164.5	$10,219	($1,120)	$24,264	13	$14,366.4	$10,219	($1,120)	$23,466	13	$1,436.6	$1,022	($112)	$2,347
14	$15,541.4	$10,168	($1,114)	$24,595	14	$14,723.4	$10,168	($1,114)	$23,777	14	$1,472.3	$1,017	($111)	$2,378
15	$15,927.6	$10,117	($1,108)	$24,936	15	$15,089.3	$10,117	($1,108)	$24,098	15	$1,508.9	$1,012	($111)	$2,410
16	$16,323.4	$1,379	($1,103)	$16,599	16	$15,464.3	$1,379	($1,103)	$15,740	16	$1,546.4	$138	($110)	$1,574
17	$16,729.0	$1,372	($1,097)	$17,003	17	$15,848.5	$1,372	($1,097)	$16,123	17	$1,584.9	$137	($110)	$1,612
18	$17,144.7	$1,365	($1,092)	$17,418	18	$16,242.4	$1,365	($1,092)	$16,515	18	$1,624.2	$136	($109)	$1,652
19	$17,570.8	$1,358	($1,086)	$17,842	19	$16,646.0	$1,358	($1,086)	$16,918	19	$1,664.6	$136	($109)	$1,692
20	$18,007.4	$1,351	($1,081)	$18,278	20	$17,059.7	$1,351	($1,081)	$17,330	20	$1,706.0	$135	($108)	$1,733
21	$18,454.9	$1,344	($1,076)	$18,724	21	$17,483.6	$1,344	($1,076)	$17,752	21	$1,748.4	$134	($108)	$1,775
22	$18,913.5	$1,338	($1,070)	$19,181	22	$17,918.1	$1,338	($1,070)	$18,186	22	$1,791.8	$134	($107)	$1,819
23	$19,383.5	$1,331	($1,065)	$19,650	23	$18,363.3	$1,331	($1,065)	$18,630	23	$1,836.3	$133	($106)	$1,863
24	$19,865.2	$1,324	($1,060)	$20,130	24	$18,819.6	$1,324	($1,060)	$19,085	24	$1,882.0	$132	($106)	$1,908
25	$20,358.8	$1,318	($1,054)	$20,622	25	$19,287.3	$1,318	($1,054)	$19,551	25	$1,928.7	$132	($105)	$1,955
			IRR	0.43%				IRR	0.12%				IRR	-7.69%
			NPV	($128,476.50)				NPV	($142,072.63)				NPV	#########
			AROI	0.19%				AROI	0.07%				AROI	-2.75%

Lifetime Savings Analysis - Photovoltaic Solar Energy Systems

ECM	Westfield High School	Edison Intermediate School	Roosevelt Intermediate School	Franklin Elementary School	Jefferson Elementary School	Lincoln Elementary School	McKinley Elementary School	Tamaques Elementary School
Assumed Inflation (Gas)								
Initial Yearly Savings (Gas)								
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$42,804.00	$14,268.00	$32,103.00	$45,182.00	$32,103.00	$21,402.00	$15,159.75	$21,402.00
Assumed Average Useful Life (Years)	25	25	25	25	25	25	25	25
Lifetime Savings	**$1,560,602.35**	**$520,200.78**	**$1,170,451.76**	**$1,647,302.48**	**$1,170,451.76**	**$780,301.18**	**$552,713.33**	**$780,301.18**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$42,804.00	$14,268.00	$32,103.00	$45,182.00	$32,103.00	$21,402.00	$15,159.75	$21,402.00
2	$44,088.12	$14,696.04	$33,066.09	$46,537.46	$33,066.09	$22,044.06	$15,614.54	$22,044.06
3	$45,410.76	$15,136.92	$34,058.07	$47,933.58	$34,058.07	$22,705.38	$16,082.98	$22,705.38
4	$46,773.09	$15,591.03	$35,079.81	$49,371.59	$35,079.81	$23,386.54	$16,565.47	$23,386.54
5	$48,176.28	$16,058.76	$36,132.21	$50,852.74	$36,132.21	$24,088.14	$17,062.43	$24,088.14
6	$49,621.57	$16,540.52	$37,216.18	$52,378.32	$37,216.18	$24,810.78	$17,574.31	$24,810.78
7	$51,110.21	$17,036.74	$38,332.66	$53,949.67	$38,332.66	$25,555.11	$18,101.53	$25,555.11
8	$52,643.52	$17,547.84	$39,482.64	$55,568.16	$39,482.64	$26,321.76	$18,644.58	$26,321.76
9	$54,222.83	$18,074.28	$40,667.12	$57,235.21	$40,667.12	$27,111.41	$19,203.92	$27,111.41
10	$55,849.51	$18,616.50	$41,887.13	$58,952.26	$41,887.13	$27,924.76	$19,780.04	$27,924.76
11	$57,525.00	$19,175.00	$43,143.75	$60,720.83	$43,143.75	$28,762.50	$20,373.44	$28,762.50
12	$59,250.75	$19,750.25	$44,438.06	$62,542.45	$44,438.06	$29,625.37	$20,984.64	$29,625.37
13	$61,028.27	$20,342.76	$45,771.20	$64,418.73	$45,771.20	$30,514.13	$21,614.18	$30,514.13
14	$62,859.12	$20,953.04	$47,144.34	$66,351.29	$47,144.34	$31,429.56	$22,262.60	$31,429.56
15	$64,744.89	$21,581.63	$48,558.67	$68,341.83	$48,558.67	$32,372.45	$22,930.48	$32,372.45
16	$66,687.24	$22,229.08	$50,015.43	$70,392.08	$50,015.43	$33,343.62	$23,618.40	$33,343.62
17	$68,687.85	$22,895.95	$51,515.89	$72,503.85	$51,515.89	$34,343.93	$24,326.95	$34,343.93
18	$70,748.49	$23,582.83	$53,061.37	$74,678.96	$53,061.37	$35,374.25	$25,056.76	$35,374.25
19	$72,870.94	$24,290.31	$54,653.21	$76,919.33	$54,653.21	$36,435.47	$25,808.46	$36,435.47
20	$75,057.07	$25,019.02	$56,292.80	$79,226.91	$56,292.80	$37,528.54	$26,582.71	$37,528.54
21	$77,308.79	$25,769.60	$57,981.59	$81,603.72	$57,981.59	$38,654.39	$27,380.19	$38,654.39
22	$79,628.05	$26,542.68	$59,721.04	$84,051.83	$59,721.04	$39,814.02	$28,201.60	$39,814.02
23	$82,016.89	$27,338.96	$61,512.67	$86,573.38	$61,512.67	$41,008.45	$29,047.65	$41,008.45
24	$84,477.40	$28,159.13	$63,358.05	$89,170.59	$63,358.05	$42,238.70	$29,919.08	$42,238.70
25	$87,011.72	$29,003.91	$65,258.79	$91,845.70	$65,258.79	$43,505.86	$30,816.65	$43,505.86

Lifetime Savings Analysis - Photovoltaic Solar Energy Systems

ECM	Washington Elementary School	Wilson Elementary School	Administration Building	Kehler Stadium Field House
Assumed Inflation (Gas)				
Initial Yearly Savings (Gas)				
Assumed Inflation (Electricity)	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$11,295.50	$11,295.50	$10,701.00	$1,070.10
Assumed Average Useful Life (Years)	25	25	25	25
Lifetime Savings	**$411,825.62**	**$411,825.62**	**$390,150.59**	**$39,015.06**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$11,295.50	$11,295.50	$10,701.00	$1,070.10
2	$11,634.37	$11,634.37	$11,022.03	$1,102.20
3	$11,983.40	$11,983.40	$11,352.69	$1,135.27
4	$12,342.90	$12,342.90	$11,693.27	$1,169.33
5	$12,713.18	$12,713.18	$12,044.07	$1,204.41
6	$13,094.58	$13,094.58	$12,405.39	$1,240.54
7	$13,487.42	$13,487.42	$12,777.55	$1,277.76
8	$13,892.04	$13,892.04	$13,160.88	$1,316.09
9	$14,308.80	$14,308.80	$13,555.71	$1,355.57
10	$14,738.07	$14,738.07	$13,962.38	$1,396.24
11	$15,180.21	$15,180.21	$14,381.25	$1,438.12
12	$15,635.61	$15,635.61	$14,812.69	$1,481.27
13	$16,104.68	$16,104.68	$15,257.07	$1,525.71
14	$16,587.82	$16,587.82	$15,714.78	$1,571.48
15	$17,085.46	$17,085.46	$16,186.22	$1,618.62
16	$17,598.02	$17,598.02	$16,671.81	$1,667.18
17	$18,125.96	$18,125.96	$17,171.96	$1,717.20
18	$18,669.74	$18,669.74	$17,687.12	$1,768.71
19	$19,229.83	$19,229.83	$18,217.74	$1,821.77
20	$19,806.73	$19,806.73	$18,764.27	$1,876.43
21	$20,400.93	$20,400.93	$19,327.20	$1,932.72
22	$21,012.96	$21,012.96	$19,907.01	$1,990.70
23	$21,643.35	$21,643.35	$20,504.22	$2,050.42
24	$22,292.65	$22,292.65	$21,119.35	$2,111.93
25	$22,961.43	$22,961.43	$21,752.93	$2,175.29

Appendix F

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Created By **C. Dowd**
Reviewed By **B. McLean**

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Westfield High School: Steam Boiler									
1	Boiler Removal (Steam)	2	Ea	$ -	$ -	2	Ea	$ 19,700.00	$ 39,400.00	39,400.00
2	Steam Boiler (12,550 MBH)	2	Ea	$ 102,500.00	$ 205,000.00	2	Ea	$ 18,600.00	$ 37,200.00	242,200.00
3	20" Stainless Steel Chimney (40')	40	L.F.	$ 98.50	$ 3,940.00	40	L.F.	$ 45.50	$ 1,820.00	5,760.00
4	Steel Steam Piping (6" and 3" in 20" case)	60	L.F.	$ 385.00	$ 23,100.00	60	L.F.	$ 13.25	$ 795.00	23,895.00
	Subtotal				232,040.00				79,215.00	

Cost data obtained from RSMeans CostWorks 2015 and vendor pricing.

SUBTOTAL =	$	311,255.00
MARKUP % =	$	0.15
MARKUP =	$	46,688.25
SUB-TOTAL w/ OH & P =	$	357,943.25
CONTINGENCY % =		0.25
CONTINGENCY =	$	89,485.81
BUDGET COST ESTIMATE =	$	447,429.06

Notes:
1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
4. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
5. Estimates do not include site conditions that may be required as part of the project. These may include abatement, remediation, or structural work.
6. Estimate assumes associated systems are available and in good working order. This includes existing chimney and venting, combustion air, floor drains, electrical and local controls.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Created By **C. Dowd**
Reviewed By **B. McLean**

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Roosevelt Intermediate School: Steam Boiler									
1	Boiler Removal (Steam)	2	Ea	0.00	$ -	2	Ea	$ 19,700.00	$ 39,400.00	39,400.00
2	Steam Boiler (8,000 MBH)	2	Ea	$95,000.00	$ 190,000.00	2	Ea	$ 17,200.00	$ 34,400.00	224,400.00
3	16" Stainless Steel Chimney (40')	40	L.F.	$76.50	$ 3,060.00	40	L.F.	$ 26.00	$ 1,040.00	4,100.00
4	Steel Steam Piping (3" and 1-1/2" in 16" case)	60	Ea	$288.00	$ 17,280.00	60	Ea	$ 12.55	$ 753.00	18,033.00
	Subtotal				210,340.00				75,593.00	

Cost data obtained from RSMeans CostWorks 2015 and vendor pricing.

SUBTOTAL =	$	285,933.00
MARKUP % =	$	0.15
MARKUP =	$	42,889.95
SUB-TOTAL w/ OH & P =	$	328,822.95
CONTINGENCY % =		0.25
CONTINGENCY =	$	82,205.74
BUDGET COST ESTIMATE =	$	411,028.69

Notes:
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2. Escalation not included in estimate.
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5. Estimates do not include site conditions that may be required as part of the project. These may include abatement, remediation, or structural work.
6. Estimate assumes associated systems are available and in good working order. This includes existing chimney and venting, combustion air, floor drains, electrical and local controls.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	McKinley Elementary School: Condensing Boiler									
1	Boiler Removal (1000 MBH) (Non-Condensing)	1	Ea	0.00	$ -	1	Ea	$ 2,950.00	$ 2,950.00	2,950.00
2	Condensing Boiler (1000 MBH)	1	Ea	$10,500.00	$ 10,500.00	1	Ea	$ 5,925.00	$ 5,925.00	16,425.00
3	6" Stainless Steel Chimney (40')	40	L.F.	$12.55	$ 502.00	40	L.F.	$ 19.85	$ 794.00	1,296.00
4	Steel Hot Water Piping	60	Ea	$64.00	$ 3,840.00	60	Ea	$ 26.00	$ 1,560.00	5,400.00
	Subtotal				14,842.00				11,229.00	

Cost data obtained from RSMeans CostWorks 2015 and vendor pricing.

SUBTOTAL =	$	26,071.00
MARKUP % =	$	0.15
MARKUP =	$	3,910.65
SUB-TOTAL w/ OH & P =	$	29,981.65
CONTINGENCY % =		0.25
CONTINGENCY =	$	7,495.41
BUDGET COST ESTIMATE =	$	37,477.06

Notes:
1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
4. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
5. Estimates do not include site conditions that may be required as part of the project. These may include abatement, remediation, or structural work.
6. Estimate assumes associated systems are available and in good working order. This includes existing chimney and venting, combustion air, floor drains, electrical and local controls.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Kehler Stadium Field House: Steam Boiler									
1	Boiler Removal (Steam)	1	Ea	0.00	$ -	1	Ea	$ 2,950.00	$ 2,950.00	2,950.00
2	Steam Boiler (320 MBH)	1	Ea	$3,875.00	$ 3,875.00	1	Ea	$ 3,400.00	$ 3,400.00	7,275.00
3	10" Stainless Steel Chimney (40')	40	L.F.	$52.50	$ 2,100.00	40	L.F.	$ 22.00	$ 880.00	2,980.00
4	Steel Steam Piping (1-1/2" and 1-1/4" in 10-3/4" case)	60	Ea	$247.00	$ 14,820.00	60	Ea	$ 11.95	$ 717.00	15,537.00
	Subtotal				20,795.00				7,947.00	

Cost data obtained from RSMeans CostWorks 2015 and vendor pricing.

SUBTOTAL =	$	28,742.00
MARKUP % =	$	0.15
MARKUP =	$	4,311.30
SUB-TOTAL w/ OH & P =	$	33,053.30
CONTINGENCY % =		0.25
CONTINGENCY =	$	8,263.33
BUDGET COST ESTIMATE =	$	41,316.63

Notes:
1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
4. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
5. Estimates do not include site conditions that may be required as part of the project. These may include abatement, remediation, or structural work.
6. Estimate assumes associated systems are available and in good working order. This includes existing chimney and venting, combustion air, floor drains, electrical and local controls.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Created By **C. Dowd**
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Jefferson Elementary School: Steam Boiler									
1	Boiler Removal	3	Ea	0.00	$ -	3	Ea	$ 2,950.00	$ 8,850.00	8,850.00
2	Steam Boiler (750 MBH)	3	Ea	$9,450.00	$ 28,350.00	3	Ea	$ 5,500.00	$ 16,500.00	44,850.00
3	12" Stainless Steel Chimney (40')	40	L.F.	$33.50	$ 1,340.00	40	L.F.	$ 24.00	$ 960.00	2,300.00
4	Steel Hot Water Piping (2" and 1-1/4" in 12-3/4" case)	60	Ea	$247.00	$ 14,820.00	60	Ea	$ 12.15	$ 729.00	15,549.00
	Subtotal				44,510.00				27,039.00	

Cost data obtained from RSMeans CostWorks 2015 and vendor pricing.

SUBTOTAL =	$	71,549.00
MARKUP % =	$	0.15
MARKUP =	$	10,732.35
SUB-TOTAL w/ OH & P =	$	82,281.35
CONTINGENCY % =		0.25
CONTINGENCY =	$	20,570.34
BUDGET COST ESTIMATE =	$	102,851.69

Notes:

1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
4. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
5. Estimates do not include site conditions that may be required as part of the project. These may include abatement, remediation, or structural work.
6. Estimate assumes associated systems are available and in good working order. This includes existing chimney and venting, combustion air, floor drains, electrical and local controls.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Created By **C. Dowd**
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Administration Building: Windows Upgrade									
1	Removal of Windows	3,225	S.F.		$ -	3,225	S.F.	$ 3.00	$ 9,675.00	9,675.00
2	New Windows	3,225	S.F.	42.50	$ 137,062.50	3,225	S.F.	$ 5.60	$ 18,060.00	155,122.50
	Subtotal				0.00				9,675.00	

Cost data obtained from RSMeans CostWorks 2015

SUBTOTAL =	$	164,797.50
MARKUP % =	$	0.15
MARKUP =	$	24,719.63
SUB-TOTAL w/ OH & P =	$	189,517.13
CONTINGENCY % =		0.25
CONTINGENCY =	$	47,379.28
BUDGET COST ESTIMATE =	$	236,896.41

Notes:
1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
4. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Created By **C. Dowd**
Reviewed By **B. McLean**

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	**Edison Intermediate School: DDC Controls** DDC Controls Per Classroom (thermostat, damper, control valve, controller)	60	Ea	$3,250.00	$ 195,000.00		Ea	$ -	$ -	195,000.00
	Subtotal				195,000.00				0.00	

Cost data obtained from RSMeans CostWorks 2015

SUBTOTAL =	$	195,000.00
MARKUP % =	$	0.15
MARKUP =	$	29,250.00
SUB-TOTAL w/ OH & P =	$	224,250.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	56,062.50
BUDGET COST ESTIMATE =	$	280,312.50

Notes:
1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
4. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Created By **C. Dowd**
Reviewed By **B. McLean**

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Wilson Elementary School: DDC Controls									
1	DDC Controls Per Classroom (thermostat, damper, control valve, controller)	26	Ea	$3,250.00	$ 84,500.00		Ea		$ -	84,500.00
	Subtotal				84,500.00				0.00	

Cost data obtained from RSMeans CostWorks 2015

SUBTOTAL =	$	84,500.00
MARKUP % =	$	0.15
MARKUP =	$	12,675.00
SUB-TOTAL w/ OH & P =	$	97,175.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	24,293.75
BUDGET COST ESTIMATE =	$	121,468.75

Notes:
1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Created By **C. Dowd**
Reviewed By **B. McLean**

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Tamaques Elementary School: DDC Controls									
1	DDC Controls Per Classroom (thermostat, damper, control valve, controller)	26	Ea	$3,250.00	$ 84,500.00		Ea		$ -	84,500.00
	Subtotal				84,500.00				0.00	

Cost data obtained from RSMeans CostWorks 2015

SUBTOTAL =	$	84,500.00
MARKUP % =	$	0.15
MARKUP =	$	12,675.00
SUB-TOTAL w/ OH & P =	$	97,175.00
CONTINGENCY % =		0.25
CONTINGENCY =	$	24,293.75
BUDGET COST ESTIMATE =	$	121,468.75

Notes:
1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
4. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Created By **C. Dowd**
Reviewed By **B. McLean**

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
	Washington Elementary School: Condensing DHW									
1	Removal of Existing Domestic Water Heater	1	Ea		$ -	1	Ea	$ 500.00	$ 500.00	500.00
2	Domestic Water Heater Condensing Unit (50 gal, 38 MBH)	1	Ea	$905.00	$ 905.00	1	Ea	$ 325.00	$ 325.00	1,230.00
	Subtotal				905.00				825.00	

Cost data obtained from RSMeans CostWorks 2015 and vendor pricing.

SUBTOTAL =	$	1,730.00
MARKUP % =	$	0.15
MARKUP =	$	259.50
SUB-TOTAL w/ OH & P =	$	1,989.50
CONTINGENCY % =		0.25
CONTINGENCY =	$	497.38
BUDGET COST ESTIMATE =	$	2,486.88

Notes:
1. Bonds not included in estimate.
2. Escalation not included in estimate.
3. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
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Appendix G

ECM	Westfield High School Steam Boiler	Roosevelt Intermediate School Steam Boiler	McKinley Elementary School Condensing Boiler	Kehler Stadium Field House Steam Boiler	Jefferson Elementary School Steam Boiler
Assumed Inflation (Gas, Oil)	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas, Oil)	$15,883.98	$5,294.63	$5,482.09	$310.80	$3,385.04
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	$0.00	$0.00	$0.00	$0.00	$0.00
Annual Maintence Cost Savings	$6,000.00	$6,000.00	$3,000.00	$3,000.00	$9,000.00
Assumed Average Useful Life (Years)	24	24	24	24	24
Lifetime Savings	**$627,220.25**	**$161,072.42**	**$166,775.47**	**$81,455.07**	**$318,979.14**
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	$21,883.98	$5,294.63	$5,482.09	$3,310.80	$12,385.04
2	$22,201.66	$5,400.52	$5,591.73	$3,317.01	$12,452.74
3	$22,525.69	$5,508.53	$5,703.57	$3,323.35	$12,521.79
4	$22,856.21	$5,618.70	$5,817.64	$3,329.82	$12,592.23
5	$23,193.33	$5,731.07	$5,933.99	$3,336.42	$12,664.07
6	$23,537.20	$5,845.70	$6,052.67	$3,343.15	$12,737.35
7	$23,887.94	$5,962.61	$6,173.73	$3,350.01	$12,812.10
8	$24,245.70	$6,081.86	$6,297.20	$3,357.01	$12,888.34
9	$24,610.61	$6,203.50	$6,423.15	$3,364.15	$12,966.11
10	$24,982.83	$6,327.57	$6,551.61	$3,371.43	$13,045.43
11	$25,362.48	$6,454.12	$6,682.64	$3,378.86	$13,126.34
12	$25,749.73	$6,583.20	$6,816.29	$3,386.44	$13,208.87
13	$26,144.73	$6,714.87	$6,952.62	$3,394.17	$13,293.05
14	$26,547.62	$6,849.17	$7,091.67	$3,402.05	$13,378.91
15	$26,958.57	$6,986.15	$7,233.50	$3,410.09	$13,466.48
16	$27,377.75	$7,125.87	$7,378.18	$3,418.29	$13,555.81
17	$27,805.30	$7,268.39	$7,525.74	$3,426.66	$13,646.93
18	$28,241.41	$7,413.76	$7,676.25	$3,435.19	$13,739.87
19	$28,686.23	$7,562.03	$7,829.78	$3,443.90	$13,834.67
20	$29,139.96	$7,713.27	$7,986.37	$3,452.77	$13,931.36
21	$29,602.76	$7,867.54	$8,146.10	$3,461.83	$14,029.99
22	$30,074.81	$8,024.89	$8,309.02	$3,471.07	$14,130.59
23	$30,556.31	$8,185.39	$8,475.20	$3,480.49	$14,233.20
24	$31,047.44	$8,349.09	$8,644.71	$3,490.10	$14,337.86

IRR, NPV, AROI - HVAC ECRMS

Westfield High School Steam		Roosevelt Intermediate School Steam		McKinley Elementary School Condensing Boiler		Kehler Stadium Field House Steam		Jefferson Elementary School Steam	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	($422,929.06)	0	($408,228.69)	0	($33,477.06)	0	($41,141.63)	0	($101,451.69)
1	$21,883.98	1	$5,294.63	1	$5,482.09	1	$3,310.80	1	$12,385.04
2	$22,201.66	2	$5,400.52	2	$5,591.73	2	$3,317.01	2	$12,452.74
3	$22,525.69	3	$5,508.53	3	$5,703.57	3	$3,323.35	3	$12,521.79
4	$22,856.21	4	$5,618.70	4	$5,817.64	4	$3,329.82	4	$12,592.23
5	$23,193.33	5	$5,731.07	5	$5,933.99	5	$3,336.42	5	$12,664.07
6	$23,537.20	6	$5,845.70	6	$6,052.67	6	$3,343.15	6	$12,737.35
7	$23,887.94	7	$5,962.61	7	$6,173.73	7	$3,350.01	7	$12,812.10
8	$24,245.70	8	$6,081.86	8	$6,297.20	8	$3,357.01	8	$12,888.34
9	$24,610.61	9	$6,203.50	9	$6,423.15	9	$3,364.15	9	$12,966.11
10	$24,982.83	10	$6,327.57	10	$6,551.61	10	$3,371.43	10	$13,045.43
11	$25,362.48	11	$6,454.12	11	$6,682.64	11	$3,378.86	11	$13,126.34
12	$25,749.73	12	$6,583.20	12	$6,816.29	12	$3,386.44	12	$13,208.87
13	$26,144.73	13	$6,714.87	13	$6,952.62	13	$3,394.17	13	$13,293.05
14	$26,547.62	14	$6,849.17	14	$7,091.67	14	$3,402.05	14	$13,378.91
15	$26,958.57	15	$6,986.15	15	$7,233.50	15	$3,410.09	15	$13,466.48
16	$27,377.75	16	$7,125.87	16	$7,378.18	16	$3,418.29	16	$13,555.81
17	$27,805.30	17	$7,268.39	17	$7,525.74	17	$3,426.66	17	$13,646.93
18	$28,241.41	18	$7,413.76	18	$7,676.25	18	$3,435.19	18	$13,739.87
19	$28,686.23	19	$7,562.03	19	$7,829.78	19	$3,443.90	19	$13,834.67
20	$29,139.96	20	$7,713.27	20	$7,986.37	20	$3,452.77	20	$13,931.36
21	$29,602.76	21	$7,867.54	21	$8,146.10	21	$3,461.83	21	$14,029.99
22	$30,074.81	22	$8,024.89	22	$8,309.02	22	$3,471.07	22	$14,130.59
23	$30,556.31	23	$8,185.39	23	$8,475.20	23	$3,480.49	23	$14,233.20
24	$31,047.44	24	$8,349.09	24	$8,644.71	24	$3,490.10	24	$14,337.86
IRR	3.21%	IRR	-14.27%	IRR	16.00%	IRR	6.31%	IRR	11.84%
NPV	$10,270.93	NPV	($336,148.52)	NPV	$41,155.23	NPV	$16,153.08	NPV	$121,632.69
AROI	1.01%	AROI	-5.37%	AROI	9.71%	AROI	3.88%	AROI	8.04%

ECM	Administration Building Window Upgrade
Assumed Inflation (Gas, Oil)	2%
Initial Yearly Savings (Gas, Oil)	$2,064.34
Assumed Inflation (Electricity)	3%
Initial Yearly Savings (Electricity)	$0.00
Assumed Average Useful Life (Years)	20
Lifetime Savings	**$50,157.91**
Year	Annual Savings
1	$2,064.34
2	$2,105.62
3	$2,147.73
4	$2,190.69
5	$2,234.50
6	$2,279.19
7	$2,324.78
8	$2,371.27
9	$2,418.70
10	$2,467.07
11	$2,516.41
12	$2,566.74
13	$2,618.08
14	$2,670.44
15	$2,723.85
16	$2,778.32
17	$2,833.89
18	$2,890.57
19	$2,948.38
20	$3,007.35
21	
22	
23	
24	

Administration Building Window Upgrade	
Year	Cash Flow
0	($236,896.41)
1	$2,064.34
2	$2,105.62
3	$2,147.73
4	$2,190.69
5	$2,234.50
6	$2,279.19
7	$2,324.78
8	$2,371.27
9	$2,418.70
10	$2,467.07
11	$2,516.41
12	$2,566.74
13	$2,618.08
14	$2,670.44
15	$2,723.85
16	$2,778.32
17	$2,833.89
18	$2,890.57
19	$2,948.38
20	$3,007.35
21	
22	
23	
24	
IRR	-11.27%
NPV	($200,302.57)
AROI	-5.80%

ECM	Washington Elementary School Condensing DHW
Assumed Inflation (Gas, Oil)	2%
Initial Yearly Savings (Gas, Oil)	$581.69
Assumed Inflation (Electricity)	3%
Initial Yearly Savings (Electricity)	$0.00
Annual Maintence Cost Savings	$0.00
Assumed Average Useful Life (Years)	24
Lifetime Savings	**$10,059.44**
Year	Annual Savings
1	$581.69
2	$593.33
3	$605.19
4	$617.30
5	$629.64
6	$642.24
7	$655.08
8	$668.18
9	$681.54
10	$695.18
11	$709.08
12	$723.26
13	$737.73
14	$752.48
15	$767.53
16	$782.88
17	$798.54
18	$814.51
19	$830.80
20	$847.42
21	$864.36
22	$881.65
23	$899.28
24	$917.27

IRR, NPV, AROI - HVAC ECRMS

Washington Elementary School Condensing DHW	
Year	Cash Flow
0	($2,436.88)
1	$581.69
2	$593.33
3	$605.19
4	$617.30
5	$629.64
6	$642.24
7	$655.08
8	$668.18
9	$681.54
10	$695.18
11	$709.08
12	$723.26
13	$737.73
14	$752.48
15	$767.53
16	$782.88
17	$798.54
18	$814.51
19	$830.80
20	$847.42
21	$864.36
22	$881.65
23	$899.28
24	$917.27
IRR	24.70%
NPV	$5,482.18
AROI	17.20%

Westfield
(Minimum Site Wind Speed @40m - 7.0 mph)

Annual kWh	55,334
Engineer's Opinion of Probable Cost	$151,000.00

Assumptions

Annual System Degredation	0.50%
Annual Utility Inflation	3.00%
Annual Maintenance Costs	$0.02/kWh Production
REC Factor	0
REIP Incentive	0
	0

Year	Utility Price	Annual Wind kWh Production	Utility Savings	Renewable Energy Credits (RECs)	Renewable Energy Incentive Program (REIP)	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow
1	0.1500	55,334.0	$8,300.1	$0	$0	($1,107)	$7,193.4	$7,193.4
2	0.1545	55,057.3	$8,506.4	$0	$0	($1,101)	$7,405.2	$14,598.6
3	0.1591	54,782.0	$8,717.7	$0	$0	($1,096)	$7,622.1	$22,220.7
4	0.1639	54,508.1	$8,934.4	$0	$0	($1,090)	$7,844.2	$30,064.9
5	0.1688	54,235.6	$9,156.4	$0	$0	($1,085)	$8,071.7	$38,136.6
6	0.1739	53,964.4	$9,383.9	$0	$0	($1,079)	$8,304.6	$46,441.3
7	0.1791	53,694.6	$9,617.1	$0	$0	($1,074)	$8,543.2	$54,984.5
8	0.1845	53,426.1	$9,856.1	$0	$0	($1,069)	$8,787.6	$63,772.1
9	0.1900	53,159.0	$10,101.0	$0	$0	($1,063)	$9,037.9	$72,809.9
10	0.1957	52,893.2	$10,352.0	$0	$0	($1,058)	$9,294.2	$82,104.1
11	0.2016	52,628.7	$10,609.3	$0	$0	($1,053)	$9,556.7	$91,660.8
12	0.2076	52,365.6	$10,872.9	$0	$0	($1,047)	$9,825.6	$101,486.5
13	0.2139	52,103.8	$11,143.1	$0	$0	($1,042)	$10,101.0	$111,587.5
14	0.2203	51,843.2	$11,420.0	$0	$0	($1,037)	$10,383.2	$121,970.7
15	0.2269	51,584.0	$11,703.8	$0	$0	($1,032)	$10,672.1	$132,642.8
16	0.2337	51,326.1	$11,994.7	$0	$0	($1,027)	$10,968.1	$143,610.9
17	0.2407	51,069.5	$12,292.7	$0	$0	($1,021)	$11,271.3	$154,882.3
18	0.2479	50,814.1	$12,598.2	$0	$0	($1,016)	$11,581.9	$166,464.2
19	0.2554	50,560.1	$12,911.3	$0	$0	($1,011)	$11,900.1	$178,364.3
20	0.2630	50,307.3	$13,232.1	$0	$0	($1,006)	$12,226.0	$190,590.2
21	0.2709	50,055.7	$13,560.9	$0	$0	($1,001)	$12,559.8	$203,150.0
22	0.2790	49,805.4	$13,897.9	$0	$0	($996)	$12,901.8	$216,051.9
23	0.2874	49,556.4	$14,243.3	$0	$0	($991)	$13,252.2	$229,304.0
24	0.2960	49,308.6	$14,597.2	$0	$0	($986)	$13,611.1	$242,915.1
25	0.3049	49,062.1	$14,960.0	$0	$0	($981)	$13,978.7	$256,893.8

Appendix H

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Steam Boiler	Westfield High School	Boiler Room	Cleaver Brooks / CB600-300	1983	75%	12,553,000 BTU	Space Heat		2	10 HP blower motor
Oil Pump	Westfield High School	Boiler Room	Marathon Electric / NVJ145TTDR7926AC	-	-	1.5 HP	Boiler		2	not in use
Hot Water Boiler	Westfield High School	Boiler Room	Parker Boiler Co / WH1410	2007	80%	1,410,000 BTU	Domestic Hot Water		1	
Storage Tank	Westfield High School	Boiler Room	Parker Boiler Co	2007	-	unknown	Domestic Hot Water		1	3' diameter, 8' tall
Hot Water Boiler	Westfield High School	Boiler Room	Parker Boiler Co / WH730	2007	80%	730,000 BTU	Domestic Hot Water		1	
Storage Tank	Westfield High School	Boiler Room	Parker Boiler Co	2007	-	unknown	Domestic Hot Water		1	3' diameter, 8' tall
Hot Water Converter	Westfield High School	Boiler Room	Unknown	1983	-	-	Domestic Hot Water		1	
Hot Water Pump 1	Westfield High School	Boiler Room	Marathon Electric	-	-	-	Space Heat		1	Constant speed
Hot Water Pump 2	Westfield High School	Boiler Room	Marathon Electric / 3VF213TTDR7026GPL	-	-	7.5 HP	Space Heat		1	Constant speed
Hot Water Pump 3	Westfield High School	Boiler Room	Armstrong / 400316-083	-	81%	2 HP	Space Heat		1	
Hot Water Pump 4	Westfield High School	Boiler Room	Armstrong / 15x15x8 4380	-	-	-	Space Heat		1	
Air Compressor	Westfield High School	Boiler Room	Quincy	1997	-	-	Contols		1	
Air Compressor	Westfield High School	Boiler Room	Curtis / 8DN80D	1989	-	80 gal	Contols		1	
Window AC	Westfield High School	Custodian's Office	Quasar / HQ2102MH	1997	10.0 EER	10,000 BTU	Custodian's Office		1	
AC Split	Westfield High School	Instrumental Music 001	Daikin	-	Unknown	-	Instrumental Music 001		2	
AC Split	Westfield High School	Music 121	Daikin	-	Unknown	-	Music 121		2	
Window AC	Westfield High School	120	Comfort Aire / RAD-243	-	Unknown	-	120		1	
Window AC	Westfield High School	111	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	111		1	
Window AC	Westfield High School	115	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	115		1	
Window AC	Westfield High School	113	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	113		1	
Window AC	Westfield High School	117	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	117		1	
Window AC	Westfield High School	119	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	119		1	
Window AC	Westfield High School	Copier Room	GE / AEM18DLG1	2008	10.7 EER	18,450 BTU	Copier Room		1	
CRAC	Westfield High School	Mail Room	Carrier / 50BRN0065	-	Unknown	-	Mail Room		1	
AC Split	Westfield High School	110	Halcyon	-	Unknown	-	110		2	
Window AC	Westfield High School		Samsung / AW089D	unknown	10.0 EER	8,000 BTU			1	
Elevator	Westfield High School	Mechanical Room	Atlantic Elevator Co	unknown	-	-			1	
Window AC	Westfield High School	Guidance Office	Frigidaire / FRA052XT7	unknown	9.7 EER	5,000 BTU	Guidance Office		1	
Window AC	Westfield High School	138	Goldstar / WG8000E	unknown	11.0 EER	7,800 BTU	138		1	
Window AC	Westfield High School	132	Carrier	unknown	Unknown	-	132		1	Old
Window AC	Westfield High School	135	Unknown	unknown	Unknown	-	135		2	
Window AC	Westfield High School	137	Frigidaire / FAM187Q2A2	2006	10.7 EER	18,500 BTU	137		2	
Warming Cabinet	Westfield High School	Kitchen	Food Warming Equipment / MTU-12	unknown	Unknown	1650 W			2	
Fridge/Freezer	Westfield High School	Kitchen	Traulsen	unknown	Unknown	-			2	
Chest Freezer	Westfield High School	Kitchen	Deifield	unknown	Unknown	-			2	
Warming Tray	Westfield High School	Kitchen	Unknown	unknown	Unknown	-			3	
Window AC	Westfield High School	150	Unknown	unknown	Unknown	-	150		1	
Window AC	Westfield High School	154	GE / AEM24DSL1	2014	9.8 EER	24,200 BTU	154		1	
Window AC	Westfield High School	156	GE / AEM24DSL1	2014	9.8 EER	24,200 BTU	156		1	
Window AC	Westfield High School	Math Lab	Goldstar / WG8000E	unknown	11.0 EER	7,800 BTU	Math Lab		2	
Window AC	Westfield High School	163	Unknown	unknown	Unknown	-	163		1	
Window AC	Westfield High School	167	Emerson Quiet Kool	unknown	Unknown	-	167		1	
Boiler	Westfield High School	Boiler Room	Aerco Benchmark 2.0	2002	Unknown	2M BTU	Science Wing		2	
Gas Fired Water Heater	Westfield High School	Boiler Room	AO Smith	2002	Unknown	100 gal, 199,900 BTU	Science Wing		1	
Hot Water Pump	Westfield High School	Boiler Room	Armstrong	2002	85.50%	7.5 HP, 1800 RPM	Science Wing		2	
Window AC	Westfield High School	392P	Goldstar / R5205	unknown	9.7 EER	5,200 BTU	392P		1	
Window AC	Westfield High School	384F	LG / LW6015ER	unknown	11.5 EER	6,000 BTU	384F		1	
Window AC	Westfield High School	239	Unknown	unknown	Unknown	-	239		1	
AHU-2	Westfield High School	Unknown	McQuay / E848407010	unknown	Unknown	-			1	Steam coil
HV-1	Westfield High School	Unknown	Unknown	unknown	Unknown	-			1	
AHU-3	Westfield High School	Unknown	McQuay	unknown	Unknown	-			1	Steam coil DX cooling
Exhaust Fan	Westfield High School	Unknown	Westinghouse	unknown	Unknown	-			2	
Window AC	Westfield High School	250	Comfort Aire / REG-123A	unknown	9.8 EER	12,000 BTU	250		1	
Window AC	Westfield High School	254	Arctic King	unknown	Unknown	-	254		1	
Window AC	Westfield High School	258	Friedrich	unknown	Unknown	-	258		1	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Window AC	Westfield High School	251	GE / AKM18DNT1	2010	10.7 EER	18,000 BTU	251		1	
Window AC	Westfield High School	262	LG / LWHD1009R	-	9.8 EER	10,000 BTU	262		1	
Window AC	Westfield High School	266	Frididaire / FRA105CV1	2004	10.8 EER	10,000 BTU	266		1	
Window AC	Westfield High School	Counseler's Office	Comfort Aire / REG-123A	-	9.8 EER	12,000 BTU	Counseler's Office		1	
RTU	Westfield High School	Roof	Carrier / 50SS-024-301AA	-	Unknown	2 tons			1	
RTU	Westfield High School	Roof	Trane / TSC036E	-	Unknown	3 tons			1	
RTU	Westfield High School	Roof	Aaon / RK06-2-E0	2002	Unknown	6 tons heat, RT-3 100,080 BTU			1	
RTU	Westfield High School	Roof	Aaon / RK08-2	2002	Unknown	8 tons cooling, 100MBH heat			1	
Condenser	Westfield High School	Roof	Lennox / HS26-036-3P	2002	Unknown	3 tons			2	
Condenser	Westfield High School	Roof	Lennox / HS26-018	2002	Unknown	1.5 tons, 18 MBH cooling			4	
Condenser	Westfield High School	Roof	Thermal Zone / TZAA3362N	2015	13 EER	3 tons			2	
RTU	Westfield High School	Roof	Aaon / RK062E0	2002	Unknown	6 tons			1	
RTU	Westfield High School	Roof	Aaon / RK082E0	2002	Unknown	8 tons			1	
Condenser	Westfield High School	Roof	Mitsubishi / PE18EK	2002	Unknown	1.5 tons			1	
Condenser	Westfield High School	Roof	Lennox	unknown	Unknown	1.5 tons			4	
Fluid Cooler	Westfield High School	Roof	J&M Fluids / PSA33DF5	-	Unknown	12-20 tons			1	
Condenser	Westfield High School	Roof	Lennox	-	Unknown	3 tons			1	
Condenser	Westfield High School	Roof	Lennox / T2A-336	2015	Unknown	3 tons			1	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Window AC	Washington Elementary School	Main Office	unknown	Unknown	unknown	unknown	Main Office	2000	2	
Boiler	Washington Elementary School	Boiler Room	HB Smith	2000	80%	2146 MBH	Space Heat	6000	2	
Motor	Washington Elementary School	Boiler Room	Marathon Electric / CVL 56T34D5328D-P	2000	80%	1 HP	Space Heat	6000	1	
Water Heater	Washington Elementary School	Boiler Room	Rheem / 22V50F1	2013	80%	50 gal, 38 MBH	DHW	8760	1	
Window AC	Washington Elementary School	3R	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	3R	2000	1	
Window AC	Washington Elementary School	1B	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	1B	2000	1	
Window AC	Washington Elementary School	1M	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	1M	2000	1	
Window AC	Washington Elementary School	20	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	20	2000	1	
Window AC	Washington Elementary School	5	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	5	2000	1	
Window AC	Washington Elementary School	2C	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	2C	2000	1	
Window AC	Washington Elementary School	2H	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	2H	2000	1	
Window AC	Washington Elementary School	1G	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	1G	2000	1	
Window AC	Washington Elementary School	Teacher's Lounge	Friedrich / SS12J10A	unknown	10 EER	12,000 BTU	Teacher's Lounge	2000	1	
Window AC	Washington Elementary School	Resource	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	Resource	2000	1	
Window AC	Washington Elementary School	Resource	Frigidaire	unknown	unknown	unknown	Resource	2000	1	
Window AC	Washington Elementary School	3G	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	3G	2000	1	
Window AC	Washington Elementary School	3B	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	3B	2000	1	
Window AC	Washington Elementary School	5U	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	5U	2000	1	
Window AC	Washington Elementary School	4R	Friedrich / CP24G30	2010	9.4 EER	5,000 BTU	4R	2000	1	
Unit Vents	Washington Elementary School	5C	unknown	unknown	-	unknown	5C	2000	1	
Unit Vents	Washington Elementary School	14	unknown	unknown	-	unknown	14	2000	1	
Unit Vents	Washington Elementary School	13	unknown	unknown	-	unknown	13	2000	1	
Unit Vents	Washington Elementary School	4L	unknown	unknown	-	unknown	4L	2000	1	
Condenser	Washington Elementary School	Outside	unknown	2000	unknown	2 tons	Cooling	2000	1	No tag
Condenser	Washington Elementary School	Outside	NAC024	2000	unknown	2 tons	Cooling	2000	3	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Window AC	Roosevelt Middle School	302	GE / ASQ18DKS1	2007	9.7 EER	17,900 BTU	302	2000	1	
Window AC	Roosevelt Middle School	300	Carrier	-	-	8,000 BTU	300	2000	1	
Steam Radiators	Roosevelt Middle School	Hallway	-	-	-	unknown	Space Heat	6000		
Window AC	Roosevelt Middle School	308	GE / AEM18DLG1	2008	10.7 EER	18,450 BTU	308	2000	1	
Window AC	Roosevelt Middle School	311	GE / AEM18DLG1	2008	10.7 EER	18,450 BTU	311	2000	1	
Window AC	Roosevelt Middle School	313	Fedders	-	-	-	313	2000	1	Old
Window AC	Roosevelt Middle School	223	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	223	2000	1	
Window AC	Roosevelt Middle School	219	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	219	2000	1	
Window AC	Roosevelt Middle School	216	GE / ASQ18DKS1	2007	9.7 EER	17,900 BTU	216	2000	1	
Portable AC	Roosevelt Middle School	Art Room	Soleus Air / LX-140/LX-140BL	-	-	14,000 BTU cooling, 12,000 BTU heating	Art Room	2000	1	
Window AC	Roosevelt Middle School	207	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	207	2000	1	
Window AC	Roosevelt Middle School	204	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	204	2000	1	
Window AC	Roosevelt Middle School	200	Frigidaire				200	2000	1	
Window AC	Roosevelt Middle School	515	GE / ASM24DKS1	2007	9.4 EER	23,700 BTU	515	2000	1	
Window AC	Roosevelt Middle School	503	Frigidaire				503	2000	1	
Window AC	Roosevelt Middle School	506	GE / ASM18DKS1	2007	9.7 EER	17,900 BTU	506	2000	1	
Window AC	Roosevelt Middle School	Faculty Lounge	GE /AGM18DJG1	2006		17,800 BTU	Faculty Lounge	2000	1	
E-7-A	Roosevelt Middle School	Electrical Room	-	-	-	unknown	Girls' Locker	4000	1	
E-6-A	Roosevelt Middle School	Electrical Room	-	-	-	unknown	Boys' Locker	4000	1	
E-4-A	Roosevelt Middle School	Electrical Room	-	-	-	unknown	Gymnasium	4000	1	
E-3-A	Roosevelt Middle School	Electrical Room	-	-	-	unknown	Gymnasium	4000	1	
Fridge	Roosevelt Middle School	Kitchen	Foster	-	-	-	-	8760	3	
Fridge	Roosevelt Middle School	Kitchen	Traulsen	-	-	-	-	8760	1	
Freezer	Roosevelt Middle School	Kitchen	Bally	-	-	-	-	8760	2	
Panelboard	Roosevelt Middle School	-	East Coast Panelboard Co / 86830	-	-	2,000 A	-	8760	3	
Window AC	Roosevelt Middle School	Faculty Dining Room	GE / AGM18DJG1	2006	10.7 EER	17,800 BTU	Faculty Dining	2000	1	
Air Compressor	Roosevelt Middle School	Boiler Room	-	-	-	-	Controls	6000	1	
Steam Boiler	Roosevelt Middle School	Boiler Room	Cleaver Brooks / CB648-200	1960	-	-	-	6000	2	Oil fired
Hot Water Boiler	Roosevelt Middle School	Boiler Room	Aerco Benchmark	-	-	-	-	8760	1	
Pump	Roosevelt Middle School	Boiler Room	Armstrong	-	-	-	-	6000	2	
Air Change Valve	Roosevelt Middle School	Boiler Room	Armstrong	-	-	-	-	-	1	
Window AC	Roosevelt Middle School	Music Office	GE	2002	-	-	Music Office	2000	1	
Window AC	Roosevelt Middle School	102	Frigidaire	-	-	-	102	2000	1	
Ductless Split AC	Roosevelt Middle School	-	Mitsubishi	-	-	2 tons		2000	2	
Window AC	Roosevelt Middle School	Guidance Office	Friedrich / WAC053H7A2	-	-	5,200 BTU	Guidance Office	2000	2	
Window AC	Roosevelt Middle School	Copier Room	Emerson Quiet Kool / 10GC13	-	-	-	Copier Room	2000	1	
Window AC	Roosevelt Middle School	Main Office	Friedrich	-	-	-	Main Office	2000	1	
Window AC	Roosevelt Middle School	Main Office	GE / AGM08LJG1	2006	-	-	Main Office	2000	1	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Window AC	McKinley Elementary School	105	LG / LW2514ER	2014	9.8 EER	24,500 BTU	105	2000	1	
Window AC	McKinley Elementary School	106	LG / LW2514ER	2014	9.8 EER	24,500 BTU	106	2000	1	
Window AC	McKinley Elementary School	103	Friedrich / CP10F10	-	10.8 EER	10,000 BTU	103	2000	1	
Window AC	McKinley Elementary School	104	LG / LW2514ER	2014	9.8 EER	24,500 BTU	104	2000	1	
Window AC	McKinley Elementary School	102	Frigidaire / FRA2965T2	unknown	8.5 EER	28,500 BTU	102	2000	1	
Window AC	McKinley Elementary School	Main Office	unknown	unknown	unknown	unknown	Main Office	2000	1	
Window AC	McKinley Elementary School	Nurse's Office	GE	unknown	unknown	unknown	Nurse's Office	2000	1	
Window AC	McKinley Elementary School	101	LG / LW2514ER	2014	9.8 EER	24,500 BTU	101	2000	1	
Window AC	McKinley Elementary School	107	LG / LW2514ER	2014	9.8 EER	24,500 BTU	107	2000	1	
Water Heater	McKinley Elementary School	Closet	Bradford White / M140L6DS-1NCWW	unknown	unknown	40 gal	Domestic hot water	8760	1	
Window AC	McKinley Elementary School	108	LG / LW2514ER	2014	9.8 EER	24,500 BTU	108	2000	1	
Window AC	McKinley Elementary School	208	LG / LW2514ER	2014	9.8 EER	24,500 BTU	208	2000	1	
Window AC	McKinley Elementary School	207	LG / LW2514ER	2014	9.8 EER	24,500 BTU	207	2000	1	
Window AC	McKinley Elementary School	206	LG / LW2514ER	2014	9.8 EER	24,500 BTU	206	2000	1	
Window AC	McKinley Elementary School	205	LG / LW2514ER	2014	9.8 EER	24,500 BTU	205	2000	1	
Window AC	McKinley Elementary School	204	LG / LW2514ER	2014	9.8 EER	24,500 BTU	204	2000	1	
Window AC	McKinley Elementary School	203	LG / LW2514ER	2014	9.8 EER	24,500 BTU	203	2000	1	
Window AC	McKinley Elementary School	Reading Center	Goldstar / R5206		9.7 EER	5,250 BTU	Reading Center	2000	1	
Window AC	McKinley Elementary School	Teacher's Room	GE / AEM18DQQ1	2013	10.7 EER	18,150 BTU	Teacher's Room	2000	1	
Window AC	McKinley Elementary School	202	Friedrich	unknown	unknown	unknown	202	2000	1	
Window AC	McKinley Elementary School	201	LG / LW2514ER	2014	9.8 EER	24,500 BTU	201	2000	1	
AHU	McKinley Elementary School	Library Storage	AHP60D3XH21A	unknown	unknown	unknown	Library	8760	4	
Window AC	McKinley Elementary School	B-4	LG / LW2514ER	2014	9.8 EER	24,500 BTU	B-4	2000	1	
Window AC	McKinley Elementary School	B-3	LG / LW2514ER	2014	9.8 EER	24,500 BTU	B-3	2000	1	
Steam Boiler	McKinley Elementary School	Boiler Room	unknown	unknown	unknown	unknown	Space Heat	6000	1	
Burner	McKinley Elementary School	Boiler Room	Power Flame / C2-G-15HTD	unknown	unknown	191 MBH	Space Heat	6000	1	
CKT-8	McKinley Elementary School	Boiler Room	Skidmore / XM2D1401	unknown	unknown	unknown	Boiler	600	1	
Fluid Power Gas Valve	McKinley Elementary School	Boiler Room	Honeywell / V4055A 1098	unknown	unknown	unknown	Boiler	6000	2	
Hot Water Boiler	McKinley Elementary School	Boiler Room	Thermific	2010	85%	1,000 MBH	Domestic hot water	8760	1	
Hot water Pump	McKinley Elementary School	Boiler Room	unknown	unknown	unknown	unknown	Heat and cool	8760	2	
Air Compressor	McKinley Elementary School	Boiler Room	Baldor	unknown	unknown	2 HP	Controls	8760	1	
Window AC	McKinley Elementary School	B-1	LG / LW2514ER	2014	9.8 EER	24,500 BTU	B-1	2000	1	
Condensate Pump	McKinley Elementary School	Pump Room	Baldor	unknown	-	-	Boiler	6000	2	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year/ motor	Quantity	Remarks
Window AC	Admin Building	Ground Maintenance Office	GE / AEN10AWH1	2012	10.8 EER	10,500 BTU	Ground Maintenance Office	2000	1	
Window AC	Admin Building	Office	Sharp	unknown	9.7 EER	10,400 BTU	Office	2000	1	
Window AC	Admin Building	Curriculum Center	Frigidaire	unknown	unknown	25,000 BTU	Curriculum Center	2000	1	
Window AC	Admin Building	Office	Friedrich / CP06E10	unknown	10.7 EER	6,000 BTU	Office	2000	1	
Window AC	Admin Building	Office	Amana	unknown	unknown	unknown	Office	2000	1	
Window AC	Admin Building	Office	Frigidaire / FAC106N1A1	unknown	10.8 EER	10,000 BTU	Office	2000	1	
Window AC	Admin Building	101	Comfort Aire / RAD-121-A	unknown	unknown	unknown	101	2000	1	
Window AC	Admin Building	101	Carrier	unknown	unknown	unknown	101	2000	1	
Window AC	Admin Building	101	Friedrich	unknown	unknown	unknown	101	2000	1	
Window AC	Admin Building	Purchasing	Amana	unknown	unknown	unknown	Purchasing	2000	1	Old
Electric Heaters	Admin Building	Board Room	unknown	unknown	unknown	unknown	Space Heat	6000	3	
Window AC	Admin Building	215	GE / AGM12ABG1	2003	10.8 EER	12,000 BTU	215	2000	2	
Window AC	Admin Building	217	Carrier	unknown	unknown	unknown	217	2000	1	
Window AC	Admin Building	Conference	International	unknown	unknown	unknown	Conference	2000	1	
Window AC	Admin Building	Office	GE / AEN12AQL1	unknown	10.8 EER	12,000 BTU	Office	2000	1	
Window AC	Admin Building	Office	Quiet Aire / ASL24DAS1	unknown	8.8 EER	23,700 BTU	Office	2000	1	
Window AC	Admin Building	Office	Gibson / GAC102P1A2	unknown	9.8 EER	10,000 BTU	Office	2000	1	
Window AC	Admin Building	Office	Frigidaire / FAC106P1A	unknown	10.8 EER	10,000 BTU	Office	2000	2	
Window AC	Admin Building	Office	Friedrich	unknown	unknown	unknown	Office	2000	1	
Window AC	Admin Building	304	unknown	unknown	unknown	unknown	304	2000	1	Old
Window AC	Admin Building	311	unknown	unknown	unknown	unknown	311	2000	1	Old
Condenser	Admin Building	Roof	Fujitsu Halcyon / A049RL2	unknown	unknown	9,000 BTU cooling, 10,000 BTU heating	unknown	2000	2	
Boiler	Admin Building	Boiler Room	HB Smith / 28A-15	unknown	unknown	3,330,000 BTU	unknown	6000	1	
Burner	Admin Building	Boiler Room	Underwrites Labs / AH897128	unknown	unknown	unknown	unknown	6000	1	
Hot Water Heater	Admin Building	Boiler Room	AO Smith / PGX 50 246	unknown	unknown	50 gal	unknown	8760	1	
Gas Unit Heaters	Admin Building	Garage	unknown	unknown	80%	unknown	Garage	6000	2	
Window AC	Admin Building	300	Panasonic / CW-XC54H4	unknown	10.8 EER	5,200 BTU	300	2000	1	
Window AC	Admin Building	309	GE / AGM24DJM1	2005	9.4 EER	23,600 BTU	309	2000	2	
Split AC	Admin Building	309	Fujitsu Halcyon / A049RL2	unknown	unknown	unknown	309	2000	2	
Window AC	Admin Building	306	Sanyo / SA900	unknown	9.0 EER	9,000 BTU	unknown	2000	1	Old

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year/ motor	Quantity	Remarks
Window AC	Jefferson Elementary School	Main Office	unknown	unknown	unknown	unknown	Main Office	2000	2	
Window AC	Jefferson Elementary School	15	LG / LW2514ER	2014	9.5 EER	9,500 BTU	15	2000	1	
Window AC	Jefferson Elementary School	18	LG / LW2514ER	2014	9.5 EER	9,500 BTU	18	2000	1	
Window AC	Jefferson Elementary School	16	LG / LW2514ER	2014	9.5 EER	9,500 BTU	16	2000	1	
Unit Vents w/ AC	Jefferson Elementary School	Classrooms	unknown	unknown	unknown	unknown	Classrooms	8760	6	
Window AC	Jefferson Elementary School	13	LG / LW2514ER	2014	9.5 EER	9,500 BTU	13	2000	1	
Window AC	Jefferson Elementary School	12	LG / LW2514ER	2014	9.5 EER	9,500 BTU	12	2000	1	
Ceiling AC	Jefferson Elementary School	11 - Library	Mitsubishi	unknown	unknown	unknown	Library	2000		
Window AC	Jefferson Elementary School	Teacher's Room	Amana	unknown	unknown	unknown	Teacher's Room	2000	1	
Window AC	Jefferson Elementary School	10	LG / LW2514ER	2014	9.5 EER	9,500 BTU	10	2000	1	
Window AC	Jefferson Elementary School	Computer Lab	Frigidaire / FRA123KT1		9.5 EER	12,000 BTU	Computer Lab	2000	1	
Window AC	Jefferson Elementary School	9	LG / LW2514ER	2014	9.5 EER	9,500 BTU	9	2000	1	
Window AC	Jefferson Elementary School	8	LG / LW2514ER	2014	9.5 EER	9,500 BTU	8	2000	1	
Window AC	Jefferson Elementary School	7	LG / LW2514ER	2014	9.5 EER	9,500 BTU	7	2000	1	
Window AC	Jefferson Elementary School	6	LG / LW2514ER	2014	9.5 EER	9,500 BTU	6	2000	1	
Window AC	Jefferson Elementary School	5	LG / LW2514ER	2014	9.5 EER	9,500 BTU	5	2000	1	
Window AC	Jefferson Elementary School	4	LG / LW2514ER	2014	9.5 EER	9,500 BTU	4	2000	1	
Window AC	Jefferson Elementary School	3	LG / LW2514ER	2014	9.5 EER	9,500 BTU	3	2000	1	
Window AC	Jefferson Elementary School	2	LG / LW2514ER	2014	9.5 EER	9,500 BTU	2	2000	1	
Window AC	Jefferson Elementary School	1	LG / LW2514ER	2014	9.5 EER	9,500 BTU	1	2000	1	
Window AC	Jefferson Elementary School	Speech Room	LG / LW1214ER	2014	11.3 EER	12,000 BTU	Speech Room	2000	1	
Window AC	Jefferson Elementary School	Art Room	Frigidaire	unknown	unknown	unknown	Art Room	2000	1	
Steam Boiler	Jefferson Elementary School	Boiler Room	Superior	1953	70%	unknown	Space Heat	6000	3	
Air Compressor	Jefferson Elementary School	Boiler Room	Quincy / QIFD0010	unknown	unknown	unknown	Controls	6000	1	
Burner	Jefferson Elementary School	Boiler Room	Superior / AB-70-AA-4	unknown	70%	unknown	Space Heat	6000	3	
Hot Water Heater	Jefferson Elementary School	Boiler Room	Rheem / PROG50-38N RH 58	2014	80%	50 gal	Domestic Hot Water	8760	1	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year/ motor	Quantity	Remarks
Hot Water Boiler	Tamaques Elementary School	Boiler Room	Aerco Benchmark / BMK 2000	2015	92%	2,000,000 BTU	Space Heat	6000	2	
Air Compressor	Tamaques Elementary School	Boiler Room	Quincy / 0003012D001	2015	unknown	unknown	Controls	6000	1	
Motor	Tamaques Elementary School	Boiler Room	Baldor / M32117-8	2015	unknown	3 HP	HW Pumping	6000	2	
Pump	Tamaques Elementary School	Boiler Room	Armstrong	2015	unknown	unknown	Space Heat	6000	2	
Window AC	Tamaques Elementary School	Classrooms	Frigidaire	2011	unknown	unknown	Classrooms	2000	17	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
EF	Edison Intermediate School	233	Zephyr / 2-10	unknown	unknown	unknown	233	3100	1	Typical
AHU w/ Hot Water Coil	Edison Intermediate School	233	Nesbitt / NM-25-H	unknown	unknown	unknown	233	6000	1	Old motor
Supply fan HV-1-B	Edison Intermediate School	232	unknown	unknown	unknown	unknown	232	6000	1	Old motor
E-1-B	Edison Intermediate School	232	unknown	unknown	unknown	unknown	232	3100	1	
EF	Edison Intermediate School	231	unknown	unknown	unknown	unknown	231	3100	1	
EF	Edison Intermediate School	Library	unknown	unknown	unknown	unknown	Library	3100	1	
Window AC	Edison Intermediate School	225	GE / AEM14APL1	2011	10.7 EER	14,000 BTU	225	2000	1	
Window AC	Edison Intermediate School	200	GE / AEM14APL1	2011	10.7 EER	14,000 BTU	200	2000	1	
Window AC	Edison Intermediate School	211	Comfort Aire / RAD-51-A	unknown	unknown	unknown	211	2000	1	
Window AC	Edison Intermediate School	213	Airtemp	unknown	unknown	unknown	213	2000	1	Old
Window AC	Edison Intermediate School	113	GE / AEM14APL1	2011	10.7 EER	14,000 BTU	113	2000	1	
Window AC	Edison Intermediate School	118	GE / AEM14APL1	2011	10.7 EER	14,000 BTU	118	2000	2	
Split AC	Edison Intermediate School	115	Mitsubishi	unknown	unknown	unknown	115	2000	1	
Split AC	Edison Intermediate School	117	Mitsubishi	unknown	unknown	unknown	117	2000	1	
Window AC	Edison Intermediate School	120	GE / AEM14APL1	2011	10.7 EER	14,000 BTU	120	2000	2	
Split AC	Edison Intermediate School	119	Nesbitt	unknown	unknown	unknown	119	2000	1	
Window AC	Edison Intermediate School	122	Frigidaire / FAC1016p1A4	unknown	10.8 EER	10,000 BTU	122	2000	1	
Fridge	Edison Intermediate School	Kitchen	Koch	unknown	unknown	unknown	Food Service	8760	8	
Fridge	Edison Intermediate School	Kitchen	Koch	unknown	unknown	unknown	Food Service	8760	8	
Freezer	Edison Intermediate School	Kitchen	-	unknown	unknown	unknown	Food Service	8760	1	
Window AC	Edison Intermediate School	Office	unknown	unknown	unknown	unknown	Office	2000	1	Covered
Window AC	Edison Intermediate School	Café	Carrier	unknown	unknown	unknown	Café	2000	1	
Window AC	Edison Intermediate School	Teacher's Room	Friedrich	unknown	unknown	unknown	Teacher's Room	2000	1	
Window AC	Edison Intermediate School	100	Friedrich	unknown	unknown	unknown	100	2000	1	
Window AC	Edison Intermediate School	111	GE / AEM10AQH1	unknown	10.8 EER	10,150 BTU	111	2000	1	
Window AC	Edison Intermediate School	Main Office	GE	unknown	unknown	unknown	Main Office	2000	1	
Unit Vent	Edison Intermediate School	Main Office	Nesbitt	unknown	unknown	unknown	Main Office	8760	1	
Window AC	Edison Intermediate School	Office	Comfort Aire / RAD-81-A	unknown	unknown	unknown	Office	2000	1	
Window AC	Edison Intermediate School	Office	Friedrich / ZQ05C10	unknown	9.7 EER	5,100 BTU	Office	2000	1	
Window AC	Edison Intermediate School	Office	Comfort Aire	unknown	unknown	unknown	Office	2000	2	
Window AC	Edison Intermediate School	Office	GE / AEN10AQH1	2012	10.8 EER	10,500 BTU	Office	2000	1	
Window AC	Edison Intermediate School	Lounge	unknown	unknown	unknown	unknown	Lounge	2000	1	Old
Hot Water Boiler	Edison Intermediate School	Boiler Room	Aerco Benchmark 6000	unknown	unknown	unknown	Space Heat	6000	3	
Expansion Tank	Edison Intermediate School	Boiler Room	Extrol / 272588	2013	unknown	1400 L	Space Heat	6000	1	
VFD	Edison Intermediate School	Boiler Room	Armstrong	unknown	unknown	unknown	Space Heat	6000	5	
Pump	Edison Intermediate School	Boiler Room	Armstrong / 56-33 125	unknown	unknown	unknown	Space Heat	6000	5	
Air Compressor	Edison Intermediate School	Boiler Room	Speedaire / 5Z688A2	unknown	unknown	5 HP	Controls	6000	1	
Hot Water Heater	Edison Intermediate School	Boiler Room	AO Smith / BT100300	2012	unknown	unknown	Domestic WH	8760	1	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Window AC	Kehler Stadium Field House	Trainer's Room	GE	2000	10EER	1 tonne	Trainer's Room	2000	1	Size, age, eff assumed
Steam Boiler	Kehler Stadium Field House	Boiler Room	Weil McLain	2000	80%	100 MBH	Stadium	6000	1	80 series
Hot Water Tank	Kehler Stadium Field House	Boiler Room	AO Smith	2000	80%	30 MBH	Stadium	8760	1	Size, age, eff assumed
Water Heater	Kehler Stadium Field House	Utility Closet	Raytherm	2010	80%	100 MBH	Training Building	8760	1	Size, age, eff assumed
RTU	Kehler Stadium Field House	Roof	Trane	2010	80%/10EER	250 MBH/5 tonne	Training Building	8760	1	Size, age, eff assumed

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Window AC	Wilson Elementary School	Principal's Office	GE / AEN10AQH1	2013	10.8 EER	10,500 BTU	Principal's Office	2000	1	
Window AC	Wilson Elementary School	Office	GE / AEN10AQH1	2013	10.8 EER	10,500 BTU	Office	2000	1	
Window AC	Wilson Elementary School	102	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	102	2000	1	
Window AC	Wilson Elementary School	106	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	106	5000	1	
Unit Vents	Wilson Elementary School	Library	Nesbit	various	-	-	Space Heat	3120		
Window AC	Wilson Elementary School	Art Room	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	Art Room	2000	1	
Window AC	Wilson Elementary School	116	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	116	2000	1	
Window AC	Wilson Elementary School	115	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	115	2000	1	
Window AC	Wilson Elementary School	114	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	114	2000	1	
Window AC	Wilson Elementary School	113	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	113	2000	1	
Window AC	Wilson Elementary School	112	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	112	2000	1	
Window AC	Wilson Elementary School	111	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	111	2000	1	
Window AC	Wilson Elementary School	103	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	103	2000	1	
Window AC	Wilson Elementary School	107	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	107	2000	1	
Window AC	Wilson Elementary School	104	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	104	2000	1	
Window AC	Wilson Elementary School	125	Friedrich	unknown	-	-	125	2000	1	
Window AC	Wilson Elementary School	Reading Center	Friedrich	unknown	-	-	Reading Center	2000	1	
Window AC	Wilson Elementary School	Office	Friedrich / CP05C10	unknown	10.7 EER	5,100 BTU	Office	2000	1	
Air Compressor	Wilson Elementary School	Boiler Room		unknown	-	-	Controls	8760	1	
Hot Water Tank	Wilson Elementary School	Boiler Room	AO Smith / BT80300	unknown	-	74 gal	Water Heating	8760	1	300 MBH
Boiler	Wilson Elementary School	Boiler Room	HB Smith	unknown	80	-	Space Heat	5000	2	
Burner	Wilson Elementary School	Boiler Room	Power Flame / C3-G0-25HBS-13	unknown	-	-	Space Heat	5000	2	
Window AC	Wilson Elementary School	204	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	204	2000	1	
Window AC	Wilson Elementary School	201	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	201	2000	1	
Window AC	Wilson Elementary School	Teacher's Lounge	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	Teacher's Lounge	2000	1	
Window AC	Wilson Elementary School	202	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	202	2000	1	
Window AC	Wilson Elementary School	203	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	203	2000	1	
Window AC	Wilson Elementary School	204	Frigidaire / FRA256SV2	2004	9.4 EER	25,000 BTU	204	2000	1	

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Hot Water Boiler	Lincoln Elementary School	Boiler Room	Modu-Fire FD	2008	88%	1000 MBH	Space heat	5000	2	Size Assumed
Pump	Lincoln Elementary School	Boiler Room	Marathon Electric / 184TTDB4026BRH	2008	-	3 HP, 5 HP	Water Loop	8760	2	
Superchanger	Lincoln Elementary School	Boiler Room	Tranter / GXD-042-L-5-UJ-41	2008	-	-	Condenser water	4000	1	
Pump	Lincoln Elementary School	Boiler Room	Weinman	2008	-	-	Condenser water	4000	2	
Cooling Tower	Lincoln Elementary School	Outside	Baltimore Aircoil Company	2008	-	-	Space cooling	4000	1	
Water Source Heat Pump	Lincoln Elementary School	Class Room	Not Accessible	2008	11 EER/3.0COP	2.5 Tonnes	Heating and Cooling	8760	24	Values Assumed

Westfield BOE - Energy Audit
Equipment List

Designation	Building	Location	Manufacturer/ Model/Type	Date	Efficiency	Capacity	Serves	Operating Hours/Year	Quantity	Remarks
Window AC	Franklin Elementary School	105	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	105	2000	1	
Window AC	Franklin Elementary School	104	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	104	2000	1	
Window AC	Franklin Elementary School	103	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	103	2000	1	
Window AC	Franklin Elementary School	102	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	102	2000	1	
Window AC	Franklin Elementary School	101	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	101	2000	1	
Window AC	Franklin Elementary School	Library	Maytag / M7Y15F2B-A	-	10.7 EER	14,500 BTU	Library	2000	2	
Window AC	Franklin Elementary School	111	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	111	2000	1	
Window AC	Franklin Elementary School	118	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	118	2000	1	
Window AC	Franklin Elementary School	112	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	112	2000	1	
Window AC	Franklin Elementary School	117	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	117	2000	1	
Window AC	Franklin Elementary School	113	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	113	2000	1	
Window AC	Franklin Elementary School	116	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	116	2000	1	
Window AC	Franklin Elementary School	114	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	114	2000	1	
Window AC	Franklin Elementary School	115	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	115	2000	1	
Split AC	Franklin Elementary School	214	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	214	2000	1	
Split AC	Franklin Elementary School	215	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	215	2000	1	
Split AC	Franklin Elementary School	213	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	213	2000	1	
Split AC	Franklin Elementary School	216	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	216	2000	1	
Split AC	Franklin Elementary School	217	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	217	2000	1	
Split AC	Franklin Elementary School	212	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	212	2000	1	
Split AC	Franklin Elementary School	218	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	218	2000	1	
Split AC	Franklin Elementary School	211B	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	211B	2000	1	
Split AC	Franklin Elementary School	211A	Sanyo / KS3632	Unknown	18 SEER	3 tonnes	211A	2000	1	
Window AC	Franklin Elementary School	204	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	204	2000	1	
Window AC	Franklin Elementary School	202	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	202	2000	1	
Window AC	Franklin Elementary School	203	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	203	2000	1	
Window AC	Franklin Elementary School	205	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	205	2000	1	
Window AC	Franklin Elementary School	206	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	206	2000	1	
Window AC	Franklin Elementary School	208	Maytag / M7Y15F2B-A	Unknown	10.7 EER	14,500 BTU	208	2000	1	
Window AC	Franklin Elementary School	207	GE / AEM24DQL2	2013	9.4 EER	24,200 BTU	207	2000	1	
Boiler	Franklin Elementary School	Boiler Room	Easco / FST-125	2012	80%	5250 MBH output	Heat	5000	2	
Burner	Franklin Elementary School	Boiler Room	Power Flame / C4-G-25HTD	2012	80%	5230 MBH	Heat	5000	2	
Air Compressor	Franklin Elementary School	Boiler Room	Skidmore	Unknown	-	-	Controls	8760	1	
Motor	Franklin Elementary School	Boiler Room	Baldor / 56613-2	Unknown	-	.5 HP	Controls	500	2	
Hot Water Tank	Franklin Elementary School	Boiler Room	Rheem / 43VP50E2	Unknown	80	50 gal	DHW	8760	1	

Appendix I

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Westfield High School	Basement	9 - Bath			2 M	2.0	1	3.5								
Westfield High School	Basement	Custodian's Bath			1 M	2.2	1	3.5								
Westfield High School	Basement	Engineer's Bath			1 M	2.2	1	3.5								
Westfield High School	Basement	Music Bath			2 M	2.2	1	3.5	1	3.5						
Westfield High School	1	Boy's			5	2.2	6	3.5	6	1.0						
Westfield High School	1	Hall													2	
Westfield High School	1	Custodial Closet									1					
Westfield High School	1	Attendance Office Kitchen			1	2.2										
Westfield High School	1	Main Office - Mail Room			1 M	2.2										
Westfield High School	1	Main Office - Copier Room			1 M	2.2										
Westfield High School	1	Men's			2 M	2.2	2	3.5	2	1.6						
Westfield High School	1	Women's			3 M	2.2	2	3.5								
Westfield High School	1	Office A Bath	1		1 M	2.2	1	3.5								
Westfield High School	1	Boy's Locker	12		3	2.2	1	3.5	4	1.0					1	
Westfield High School	1	Closet									1					
Westfield High School	1	Women's Locker - Office	1		1	2.2	1	3.5								
Westfield High School	1	Women's Locker	12		2	2.2	3	3.5							2	
Westfield High School	1	Custodial Closet									1					
Westfield High School	1	Hall													1	
Westfield High School	1	Nurse's Bath			1 M	2.2	1	3.5								
Westfield High School	1	Custodial Closet									1					
Westfield High School	1	Women's			3	2.2	3	3.5								
Westfield High School	1	Men's			4	2.2	2	3.5	5	1.0						
Westfield High School	1	Storage									1					
Westfield High School	1	Boy's			2	2.2	2	3.5	2	1.0						
Westfield High School	1	Girl's			5	2.2	4	3.5								
Westfield High School	3	Boy's			2 M	2.2	2	3.5	2	1.0						
Westfield High School	3	Girl's			5 M	2.2	4	3.5								
Westfield High School	2	Phys Ed Office			1 M	2.2	1	3.5								
Westfield High School	2	Locker	5		2 M	2.2	1	3.5	2	1.0						
Westfield High School	2	Utility Closet									1					
Westfield High School	2	Hall													14	
Westfield High School	2	Boy's			5	2.2	3	3.5	8	1.0						
Westfield High School	2	Girl's			5	2.2	1	3.5								
Westfield High School	2	Women's			3	2.2	3	3.5								
Westfield High School	2	Men's			4	2.2	2	3.5	5	1.0						
Westfield High School	2	Boy's			2	2.2	2	3.5	2	1.0						
Westfield High School	2	Girl's														
Westfield High School	2	Faculty Bath			1 M	2.2	1	1.6								
Westfield High School	2	Auditorium Men's			2 M	2.2	2	3.5	2	1.0						
Westfield High School	2	Auditorium Women's			3 M	2.2	3	3.5								
Westfield High School	3	Teacher's Bath			1 M	2.2	2	3.5	1	1.0						

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Washington Elementary School	1	Boy's			3 M	2.2	3	3.5	4	1.0						
Washington Elementary School	1	Girl's			3 M	2.2	5	3.5								
Washington Elementary School	1	Custodian's Closet									1					
Washington Elementary School	1	3R			1 M	2.2	1	3.5								
Washington Elementary School	1	1B			1 M	2.2										
Washington Elementary School	1	1M			1 M	2.2	1	3.5								
Washington Elementary School	1	20			1 M	2.2										
Washington Elementary School	1	5			1 M	2.2	1	3.5								
Washington Elementary School	1	2C			1 M	2.2	1	3.5								
Washington Elementary School	1	2H			1 M	2.2										
Washington Elementary School	1	1G			1 M	2.2	1	3.5								
Washington Elementary School	1	Men's			1 M	2.2	1	3.5	1	1.0						
Washington Elementary School	1	Teacher's Lounge			1 M	2.2										
Washington Elementary School	1	Media			1 M	2.2	1	3.5								
Washington Elementary School	1	Resource			1 M	2.2	1	3.5								
Washington Elementary School	1	Hallway													1	
Washington Elementary School	1	3B			1 M	2.2										
Washington Elementary School	1	3G			1 M	2.2										
Washington Elementary School	1	5U			1 M	2.2										
Washington Elementary School	1	4R			1 M	2.2										
Washington Elementary School	1	5C			1 M	2.2										
Washington Elementary School	1	4L			1 M	2.2										
Washington Elementary School	1	14			1 M	2.2										
Washington Elementary School	1	13			1 M	2.2										
Washington Elementary School	1	Girl's					3	3.5								
Washington Elementary School	1	Boy's			2	2.2	2	3.5	2	1.0						
Washington Elementary School	1	Custodial Closet/Bath									1					

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Roosevelt Middle School	3	300			1 M	2.2	1	3.5								
Roosevelt Middle School	3	Hall													1	
Roosevelt Middle School	3	Women's			3 M	2.2	3	3.5								
Roosevelt Middle School	3	Women's Utility									1					
Roosevelt Middle School	3	Boy's			3 M	2.2	2	3.5	3	1.0						
Roosevelt Middle School	3	Boy's Utility									1					
Roosevelt Middle School	3	324			1 M	2.2	1	3.5								
Roosevelt Middle School	2	Boy's			3 M	2.2	2	3.5	3	1.0						
Roosevelt Middle School	2	Boy's Utility									1					
Roosevelt Middle School	2	210									1					
Roosevelt Middle School	2	Boy's			4 M	2.2	2	3.5	3	1.0						
Roosevelt Middle School	2	Girl's			4 M	2.2	3	3.5								
Roosevelt Middle School	2	Faculty Women's			1 M	2.2	1	3.5								
Roosevelt Middle School	2	Faculty Men's			1 M	2.2	1	3.5								
Roosevelt Middle School	1	Kitchen Bath			1 M	2.2	1	3.5								
Roosevelt Middle School	1	Girl's			2 M	2.2	2	3.5								
Roosevelt Middle School	1	Boy's			2	2.2	2	3.5	2	1.0						
Roosevelt Middle School	1	Phys Ed Bath	1		1 M	2.2	1	3.5								
Roosevelt Middle School	1	Girl's Locker Room			2 M	2.2	2	3.5								
Roosevelt Middle School	1	Boy's Locker Room			1 M	2.2	1	3.5								
Roosevelt Middle School	1	Boy's			2 M	2.2	1	3.5	1	1.0						
Roosevelt Middle School	1	Comp Lab 123									1					
Roosevelt Middle School	1	Auditorium Staff Bath			1 M	2.2	1	3.5								
Roosevelt Middle School	1	Custodian's Bath			1 M	2.2	1	3.5								
Roosevelt Middle School	1	Nurse's Office Bath			1 M	2.2	1	3.5								
Roosevelt Middle School	1	Girl's			4 M	2.2	6	3.5								
Roosevelt Middle School	1	Boy's			4 M	2.2	2	3.5	4	1.0	1					
Roosevelt Middle School	1	Office Bath			1 M	2.2	1	3.5								

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
McKinley Elementary School	1	Nurse's Bath			1 M	2.2	1	3.5								
McKinley Elementary School	1	Girl's			2	2.2	4	3.5								
McKinley Elementary School	1	Faculty Bath			1	2.2	1	3.5								
McKinley Elementary School	1	Boy's			2	2.2	2	3.5	2	1.0						
McKinley Elementary School	2	Boy's			2	2.2	2	3.5	2	1.0						
McKinley Elementary School	2	Faculty Bath			1	2.2	1	3.5								
McKinley Elementary School	2	Girl's			2	2.2	4	3.5								
McKinley Elementary School	2	Teacher's Bath			1 M	2.2	1	3.5								
McKinley Elementary School	Basement	Girl's			2	2.2	2	3.5								
McKinley Elementary School	Basement	Boy's			2	2.2	1	3.5	1	1.0						
McKinley Elementary School	Basement	B-4			1	2.2	1	3.5								
McKinley Elementary School	Basement	Hall													4	
McKinley Elementary School	Basement	B-3			1	2.2	1	3.5								
McKinley Elementary School	Basement	Boy's			2 M	2.2	3	3.5	3	1.0						
McKinley Elementary School	Basement	Girl's			3 M	2.2	5	3.5			1					
McKinley Elementary School	Basement	Ladies			1 M	2.2	1	3.5								
McKinley Elementary School	Basement	Boy's			1 M	2.2	1	3.5								

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Administration Building	Basement	Boy's			4 M	2.2	5	3.5	4	1.0						
Administration Building	Basement	Girl's			2	2.2	3	3.5								
Administration Building	Basement	Storage									1					
Administration Building	Basement	Office Bath			1 M	2.2	1	3.5								
Administration Building	1	Auditorium Bath			1 M	2.2	1	3.5								
Administration Building	1	Auditorium Bath			1 M	2.2	1	3.5								
Administration Building	2	Women's			2 M	2.2	2	3.5								
Administration Building	2	Men's			2	2.2	2	3.5	4	1.0	1					

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Jefferson Elementary School	1	Office Bath			1 M	2.2	1	3.5								
Jefferson Elementary School	1	Office Bath			1 M	2.2	1	3.5								
Jefferson Elementary School	1	17			1 M	2.2										
Jefferson Elementary School	1	Boy's			2	2.2	2	3.5	2	1.0						
Jefferson Elementary School	1	Girl's			2	2.2	3	3.5								
Jefferson Elementary School	1	Custodial Closet			3	2.2	3	3.5	4	1.0	1					
Jefferson Elementary School	1	Boy's			2	2.2	2	3.5	2	1.0						
Jefferson Elementary School	1	Girl's			3	2.2	5	3.5								
Jefferson Elementary School	1	Library			1	2.2	1	3.5								
Jefferson Elementary School	1	Faculty Women's			2	2.2	2	3.5								
Jefferson Elementary School	1	Faculty Men's			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 10			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 9			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 8			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 7			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 6			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 5			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 4			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 3			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 2			1	2.2	1	3.5								
Jefferson Elementary School	1	Bath - 1			1	2.2	1	3.5								
Jefferson Elementary School	1	Girl's			1	2.2	2	3.5								
Jefferson Elementary School	1	Boy's			2	2.2	1	3.5	2	1.0						
Jefferson Elementary School	1	Boy's			1	2.2	1	3.5								
Jefferson Elementary School	1	Girl's			1	2.2	1	3.5								

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Tamaques Elementary School	1	Office Bath			1	2.2	1	3.5								
Tamaques Elementary School	1	Boy's			3	2.2	2	3.5	3	1.0						
Tamaques Elementary School	1	Girl's			3	2.2	5	3.5								
Tamaques Elementary School	1	Classroom 1			1	2.2	1	3.5								
Tamaques Elementary School	1	Classroom 2			1	2.2	1	3.5								
Tamaques Elementary School	1	Classroom 3			1	2.2	1	3.5								
Tamaques Elementary School	1	Classroom 4			1	2.2	1	3.5								
Tamaques Elementary School	1	Classroom 5			1	2.2	1	3.5								
Tamaques Elementary School	1	Classroom 6			1	2.2	1	3.5								
Tamaques Elementary School	2	Girl's			3	2.2	5	3.5								
Tamaques Elementary School	2	Boy's			3	2.2	2	3.5	3	1.0						
Tamaques Elementary School	2	Hall													2	

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Edison Intermediate School	2	Hall													7	
Edison Intermediate School	2	Girl's			4	2.2	5	3.5								
Edison Intermediate School	2	Boy's			4	2.2	3	3.5	3	1.0						
Edison Intermediate School	2	Janitors Closet 8									1					
Edison Intermediate School	2	Janitors Closet 7									1					
Edison Intermediate School	2	Janitors Closet 6									1					
Edison Intermediate School	1	Janitors Closet 5									1					
Edison Intermediate School	1	Phys Ed Office	1				1	3.5								
Edison Intermediate School	1	Locker Room + Utility	1		2	2.2	2	3.5			1					
Edison Intermediate School	1	Locker Room			2 M	2.2	1	3.5	2	1.0	1					
Edison Intermediate School	1	Locker Bath			1 M	2.2	1	3.5	1	1.0						
Edison Intermediate School	1	Utility									1					
Edison Intermediate School	1	Women's			4	2.2	4	3.5								
Edison Intermediate School	1	Hall													2	
Edison Intermediate School	1	Cafeteria													4	
Edison Intermediate School	1	Boy's			4	2.2	2	3.5	3	1.0						
Edison Intermediate School	1	Janitors Closet 4									1					
Edison Intermediate School	1	Lounge			1 M	2.2	2	3.5								
Edison Intermediate School	1	Faculty Men's			1 M	2.2	1	3.5								
Edison Intermediate School	1	Hall													1	
Edison Intermediate School	1	Office Women's			1 M	2.2	1	3.5								
Edison Intermediate School	1	Office Men's			1 M	2.2	1	3.5								
Edison Intermediate School	1	Bath			1 M	2.2	1	3.5								
Edison Intermediate School	1	Men's			3 M	2.2	2	3.5	3	1.0						
Edison Intermediate School	1	Utility									1					
Edison Intermediate School	1	Women's			3 M	2.2	3	3.5								
Edison Intermediate School	1	131			1 M	2.2										

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Kehler Stadium Field House	1	Locker Bath			2 M	2.2	2	3.5	6	1.0						
Kehler Stadium Field House	1	Men's			1 M	2.2	2	3.5	6	1.0						
Kehler Stadium Field House	1	Trainer's Room			1 M	2.2										
Kehler Stadium Field House	1	Locker Room													2	
Kehler Stadium Field House	2	Coach's Bath			1 M	2.2	1	3.5	1	1.0						
Kehler Stadium Field House	1	Locker Bath			2 M	2.2	2	3.5	6	1.0					2	
Kehler Stadium Field House	1	Utility									1					
Kehler Stadium Field House	1	Bath	1		1 M	2.2									1	
Kehler Stadium Field House	1	Bath			1 M	2.2	1	3.5								
Kehler Stadium Field House	1	Bath	1		1 M	2.2										
Kehler Stadium Field House	1	Weightroom													1	
Kehler Stadium Field House	1	Utility									1					
Kehler Stadium Field House	1	Women's Locker			4 M	2.2	6	3.5								

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Wilson Elementary School	1	Principal's Bath			1 M	2.2	1	3.5								
Wilson Elementary School	1	Office Bath			1 M	2.2	1	3.5								
Wilson Elementary School	1	Hall									1				4	
Wilson Elementary School	1	Girl's			3	2.2	5	3.5								
Wilson Elementary School	1	Faculty Bath			1	2.2	1	3.5								
Wilson Elementary School	1	Nurse's Bath			1	2.2	1	3.5								
Wilson Elementary School	1	Custodian's Closet									1					
Wilson Elementary School	1	Art Bath			1 M	2.2	1	3.5							1	
Wilson Elementary School	1	116			1 M	2.2	1	3.5							1	
Wilson Elementary School	1	115			1 M	2.2	1	3.5							1	
Wilson Elementary School	1	114			1 M	2.2	1	3.5							1	
Wilson Elementary School	1	113			1 M	2.2	1	3.5							1	
Wilson Elementary School	1	112			1 M	2.2	1	3.5							1	
Wilson Elementary School	1	111			1 M	2.2	1	3.5							1	
Wilson Elementary School	1	Women's			2 M	2.2	2	3.5								
Wilson Elementary School	1	122			1 M	2.2	1	3.5								
Wilson Elementary School	1	Men's			2 M	2.2	1	3.5	2	1.0						
Wilson Elementary School	1	Boy's			3	2.2	3	3.5	3	1.0						
Wilson Elementary School	1	Faculty Bath			1	2.2	1	3.5			1					
Wilson Elementary School	2	Girl's			3	2.2	4	3.5			1					
Wilson Elementary School	2	Boy's			3	2.2	3	3.5	3	1.0	1					
Wilson Elementary School	2	Hall													2	

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Lincoln Elementary School	2	204			1 M	2.0	1	1.6								
Lincoln Elementary School	2	Staff Bath			1 M	2.0	1	1.6								
Lincoln Elementary School	2	205			1 M	2.0	1	1.6								
Lincoln Elementary School	2	202			1 M	2.0	1	1.6								
Lincoln Elementary School	2	208			1 M	2.0	1	1.6								
Lincoln Elementary School	2	201			1 M	2.0	1	1.6								
Lincoln Elementary School	2	Hall													1	
Lincoln Elementary School	3	301			1 M	2.0	1	1.6								
Lincoln Elementary School	3	308			1 M	2.0	1	1.6								
Lincoln Elementary School	3	Custodian's Closet									1					
Lincoln Elementary School	3	302			1 M	2.0	1	1.6								
Lincoln Elementary School	3	307			1 M	2.0	1	1.6								
Lincoln Elementary School	3	Hall													1	
Lincoln Elementary School	3	303			1 M	2.0	1	1.6								
Lincoln Elementary School	3	306			1 M	2.0	1	1.6								
Lincoln Elementary School	3	Staff Bath			1 M	2.0	1	1.6								
Lincoln Elementary School	3	304			1 M	2.0	1	1.6								
Lincoln Elementary School	3	305			1 M	2.0	1	1.6								
Lincoln Elementary School	1	102			1 M	2.0	1	1.6								
Lincoln Elementary School	1	Restroom			1 M	2.0	1	1.6								
Lincoln Elementary School	1	103			1 M	2.0	1	1.6								
Lincoln Elementary School	1	Nurse's Bath			1 M	2.0	1	1.6								
Lincoln Elementary School	1	101			1 M	2.0	1	1.6								
Lincoln Elementary School	1	Hall													1	

		Fixture Type	Shower		Sink		Toilet		Urinal		Slop Sink		Extra		Drinking Fountain	
Building	**Floor**	**Room**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPF**	**Qty**	**GPF**	**Qty**	**GPM**	**Qty**	**GPM**	**Qty**	**GPM**
Franklin Elementary School	1	Hall													4	
Franklin Elementary School	1	Women's			2	2.2	4	3.5			1					
Franklin Elementary School	1	Men's			2 M	2.2	2	3.5	1	1.0						
Franklin Elementary School	1	Utility									1					
Franklin Elementary School	1	Women's			2 M	2.2	2	3.5								
Franklin Elementary School	1	111			1 M	2.2	1	3.5							1	
Franklin Elementary School	1	118			1 M	2.2	1	3.5							1	
Franklin Elementary School	1	112			1 M	2.2	1	3.5							1	
Franklin Elementary School	1	117			1 M	2.2	1	3.5							1	
Franklin Elementary School	1	113			1 M	2.2	1	3.5							1	
Franklin Elementary School	1	116			1 M	2.2	1	3.5							1	
Franklin Elementary School	1	114			1 M	2.2	1	3.5							1	
Franklin Elementary School	1	115			1 M	2.2	1	3.5							1	
Franklin Elementary School	2	Boy's			2 M	2.2	2	3.5	1	1.0						
Franklin Elementary School	2	Hall													4	
Franklin Elementary School	2	Staff Bath			1 M	2.2	1	3.5								
Franklin Elementary School	2	Girl's			2 M	2.2	2	3.5								
Franklin Elementary School	2	Women's			3	2.2	5	3.5			1					
Franklin Elementary School	2	Men's			3	2.2	3	3.5	3	1.0	1					
Franklin Elementary School	1	Staff Bath			1 M	2.2	1	3.5								
Franklin Elementary School	1	Boy's			1	2.2	3	3.5	3	1.0	1					