### WEST ESSEX REGIONAL SCHOOL DISTRICT HIGH SCHOOL ENERGY ASSESSMENT

for

NEW JERSEY BOARD OF PUBLIC UTILITIES

### CHA PROJECT NO. 23985

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### **REPORT DISCLAIMER**

A thorough walkthrough of the facility was performed, which included gathering nameplate information and operating parameters for all accessible equipment and lighting. Unless otherwise stated, model, efficiency, and capacity information outlined below was collected directly from equipment nameplates and / or documentation provided during the site visit. Typical operation and scheduling information was obtained from interviewing facility staff and spot measurements taken in the field. Cost data does not include soft costs such as Engineering fees, legal fees, project management fees, financing, etc.

This audit was conducted in accordance with the standards developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) for a Level II audit. Cost and saving calculations for a given measure were estimated to within  $\pm 20\%$ , and based on professional experience and standard practice. CHA is not liable if actual savings of the study are not achieved.

## 1.0 EXECUTIVE SUMMARY

The West Essex Regional School District engaged CHA to perform an energy audit in connection with the New Jersey Board of Public Utilities' Local Government Energy Audit Program. This report details the results of the energy audit conducted for:

Building Name	Address	Square Feet	Construction
West Essex Regional School District High School Building	65 West Greenbrook Road North Caldwell, NJ 07006	232,931	Original: 1961 Renovation: 1995 & 2005

The Energy Conservation Measures (ECMs) identified in this report will allow for a more efficient use of energy and, if pursued, have the opportunity to qualify for the New Jersey SmartStart Buildings Program and/or Direct Install Program. Potential annual savings of \$185,500 for the recommended ECMs may be realized with a payback of 5.2 years.

A summary of the costs, savings, and paybacks for the recommended ECMs follows:

		Summary	of Energy Co	onservation I	Measures		
Energ	y Conservation Measure	Approx. Costs (\$)	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation (X)
ECM- 1	Lighting Replacement / Upgrades	284,600	28,200	10.1	62,020	7.9	
2	Lighting Controls (Occupancy Sensors)	83,300	18,000	4.6	9,000	4.1	
3	Lighting Replacements with Controls (Occupancy Sensors)	367,900	41,700	8.8	71,020	7.1	х
4	HVAC Condensing Boiler Addition	120,300	7,300	16.5	3,000	16.1	
5	HVAC Water Systems Control Temperature Reset	11,000	2,400	4.6	-	4.6	Х
6	HVAC Chilled Water System Glycol Replacement	83,600	21,700	3.9	-	3.9	Х
7	Replace HVAC Electric Duct Heating Coils	131,300	70,700	1.9	-	1.9	Х
8	Install Variable Speed Drives, High Efficiency Motors	100,400	18,200	5.5	16,568	4.6	Х

Energ	y Conservation Measure	Approx. Costs (\$)	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation (X)
9	HVAC Building Automation System Upgrade/Re- commissioning	246,200	22,100	11.1	-	11.1	Х
10	Add HVAC Demand Control Ventilation	35,500	2,000	17.8	-	17.8	
11	Add CoolTrol Walk-in Controls	37,500	8,700	4.3	50	4.3	Х
12	Add Variable Speed Kitchen Hood Controls	42,800	900	>20	-	>20	

## 2.0 INTRODUCTION AND BACKGROUND

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

The West Essex Regional School District High School shares a campus with the Middle School in North Caldwell, NJ. The High School building is a 232,931 square foot facility consisting of multiple wings and blocks of rooms. The majority of the building is a single story structure with a high bay auditorium, and gyms. Most HVAC equipment is located on rooftops over areas being served; however, the high bay spaces have indoor mechanical mezzanines that house air handling units (AHUs). A chiller plant building located behind the main high school building in the northeast corner also houses a wood shop and maintenance shop. The building was constructed in 1961, with renovations in 1995 and 2005. Occupancy includes approximately 1,050 students and 180 faculty members. The high school operates Monday through Friday from 7:00 AM to approximately 11:00 PM, 7:00 AM to 3:00 PM on Saturday, and 3:00 PM to 11:00 PM on Sunday. This includes after-school activities and athletic events Monday through Friday, and various academic and athletic events on the weekend.



### 3.0 EXISTING CONDITIONS

#### 3.1 Building - General

Built in 1961, the West Essex Regional District high school building is a 232,931 square foot, one-story facility with rooms/areas grouped in blocks or wings, as described below. The main entrance has a covered walkway running parallel to the 100 Block rooms that connects into the building in Lobby 120. From left to right (refer to photo above), it includes the following blocks of rooms/areas:

- Science Rooms Block (200 through 217)
- · Classroom Block (Rooms 300 through 317)
- Principal's and Guidance Offices Block (Rooms 400 through 409)
- Music, Art, Home Economics, and Wood Shop Block (Rooms 100 through 110)
- Auditorium with Stage, Control Room and Studios (Rooms 112 through 123)
- Media Center/Library Block with Additional Science Classrooms (Room 509 through 515)
- Cafeteria and Kitchen Block with Faculty Lounges & Workrooms (Rooms 600 through 620)
- · Maintenance Office, Boiler Room, Storage Areas Block (Rooms 622 through 622H)
- One Classroom and Nurse's Office Block (Rooms 628, 630, respectively)
- · Classroom Block (Rooms 700 through 731)
- · Computer Labs and Classrooms Block (Rooms 801 through 819)
- East Gym and West Gym with Locker Facilities Block (Rooms 900 through 930)
- · Chiller Plant Building, Separate (Northeast Corner of main building, Block 800 Rooms)
  - · Chiller Plant (Room 1002)
  - Maintenance Shop (1001)
  - Wood Shop (Room 1000)
  - · Computer Room (Room 1000)

The high school has approximately 1,050 students and 180 faculty and staff, and appeared fully utilized during the site visit. The building can be assumed to be fully occupied by the 1,230 people until 5:00 PM during the week, and by approximately 300 people for the remaining hours, and on the weekends. The hours of operation are:

- Monday through Friday 7:00 AM to 11:00 PM
- Saturday 7:00 AM to 3:00 PM
- Sunday 3:00 PM to 11:00 PM

The building blocks/wings are constructed of block walls with a brick veneer; this includes the taller spaces such as the gyms and auditorium. The majority of interior walls are painted block; 3-5/8" metal studs filled with fiberglass insulation finished with gypsum board are used in spaces such as front office areas. The two gymnasiums each have at least one wall section of light-transmitting Kalwall panels that provide daylighting. The flat roof system is comprised of a structural steel framing with a metal deck having rigid insulation with asphalt rolled roofing. Stone ballast is used on the roof of the 200 Block Rooms, and the remaining roofs have a light colored asphaltic rolled roofing product. All original roofing had been replaced by 2005. Windows are minimal (<20% on walls where used), and original windows have all been replaced with double pane glazing with a dark brown tint mounted in aluminum frames. The entrance doors are solid composite doors with minimal glass. The majority of the single story classroom block areas are 14' in height, with the auditorium, two gyms, and cafeteria approximately 25' tall. The building has no basement, and all occupied spaces have slab floors at grade.

## 3.2 Utility Usage

Utilities include electricity, natural gas, and potable water. Electricity is delivered by PSE&G and supplied by Integrys to the school building and stadium facilities. Electricity is delivered and supplied by PSE&G for the parking lot lights, which are owned by the utility. Natural gas is delivered by PSE&G and supplied by Compass Energy Services Gas. Potable water is provided by the municipally owned water department at a charge. See Appendix A for a detailed high school utility analysis.

The high school has one electric meter serving the main school building. One electric meter serves the utility-owned parking lot lights; additional meters serve the stadium facilities (press box, concession, restrooms, etc.). The parking lot lights and stadium facility electric meters are separate, and have no impact on report calculations for the high school building. However, information and charts in Appendix A, *U*tility Usage Analysis, are included for reference. From July 2010 through June 2011, the electric usage for the high school building electric meter was approximately 3,153,210 kWh at a cost of about \$426,200. Review of electricity bills during this period showed that the complex was charged at the following rates: unit consumption cost of \$0.12 per kWh; demand unit cost of \$17.36 per kW; and blended unit cost of \$0.135 per kWh. Electrical usage was generally level throughout the year, which could be a result of electric zone reheat equipment and current HVAC systems operation schedule.

The high school has two natural gas meters, one serving the building HVAC and plumbing equipment, the other for the kitchen equipment. From July 2010 through June 2011, gas-fired equipment consumed about 125,110 therms of natural gas. Based on the annual cost of \$42,000, the blended price for natural gas was \$1.412 per therm. Natural gas consumption was highest in winter months for heating.

The delivery component of the electric and natural gas bills will always be the responsibility of the utility that connects the facility to the power grid or gas line; however, the supply can be purchased from a third party; as is currently the case with electricity and natural gas. The electricity or natural gas commodity supply entity will require submission of one to three years of past energy bills. Contract terms can vary among suppliers. According to the U.S. Energy Information Administration, the average commercial unit costs of electricity and natural gas in New Jersey during the same periods as those noted above was \$0.141 per kWh and \$0.959 per therm. The electricity supply rate charged by Integrys for the nine month period from October 2010 through June 2011 resulted in greater cost to the school district versus having PSE&G both supply and deliver (see following table). It is recommended that the present electricity supplier be renegotiated.

	Integrys Supply	PSE&G Supply
July-10	-	-
August-10	-	
September-10		
October-10	\$ 26,759	\$ 21,489
November-10	\$ 22,274	\$ 13,755
December-10	\$ 25,074	\$ 15,064
January-11	\$ 30,642	\$ 27,638
February-11	\$ 28,440	\$ 25,299
March-11	\$ 28,294	\$ 20,391
April-11	\$ 27,193	\$ 17,859
May-11	\$ 21,546	\$ 16,513
June-11	\$ 25,482	\$ 22,275
Total	\$ 235,704	\$ 180,283
Additional Cost of Integrys Supply Charge	\$55	,421

A list of approved electrical and natural gas energy commodity suppliers can be found in Appendix A.

### 3.3 HVAC Systems

The systems and equipment described below serve the high school building. Specifics on the mechanical equipment can be found within the equipment inventory located in Appendix B.

#### 3.3.1 Heating Hot Water Systems

The high school building is heated with hot water supplied by two Universal Boiler Works sectional gas fired boilers with Powerflame full modulation gas burners. The boilers were installed in a system upgrade in 1995, and are located in Boiler Room 622J. Operable outside air dampers provide boiler combustion air, and remain open at all times since system currently operates on occupied schedule 24/7. This boiler room is not mechanically ventilated for cooling, and is heated by ceiling mounted hot water unit heaters. It is assumed the boilers are off during the summer, and outside air dampers are likely opened.

The boilers are piped to a primary pumping system with two 20 HP pumps that operate in lead-lag, and one 20 HP pump for stand by. The pumps are constant volume with standard efficiency motors, and 3-way modulating valve for system control. Hot water is provided to the rooftop units, indoor AHUs, classroom unit ventilators (UVs), recessed wall convectors/cabinet heaters, and fintube radiators. All system piping and valves in the mechanical rooms appear to be insulated.

#### 3.3.2 Chilled Water System

A chiller plant building was constructed in 2005 behind the northeast side of the school building. Chilled water is provided by two water cooled chillers. Each 500 ton Trane centrifugal chiller uses R123A refrigerant, and is water cooled by a Baltimore Air Coil cooling tower behind the chiller plant building. Two 20 HP high efficiency condenser water pumps with variable speed drives (VSDs) provide

condenser water to the 2-cell cooling tower with VSDs on each of the two fans, which vary with leaving condenser water temperature.

Three 50 HP high efficiency chilled water pumps with VSDs provide chilled water to a variable flow primary pumping system with a 2-way modulating bypass control valve to the rooftop units and classroom UVs. Two pumps operate in lead-lag operation with one stand-by pump; a glycol solution is used to provide freeze protection down to  $+10^{\circ}$ F. This requires the water to be constantly circulated in the piping during winter months to prevent freezing and pipe bursts at lower temperatures.

The chiller plant room is heated by seven electric wall mounted unit heaters. A refrigerant leak detection system with a dedicated exhaust fan and outside air intakes monitors the space and is also directly connected to the facility building automation system (BAS).

### 3.3.3 Rooftop Cooling & Heating Air Handling Units

Trane T-Series Climate Changer packaged RTUs installed in 2005 serve the majority of the areas, including the auditorium, kitchen, cafeteria, 900 block gyms/lockers/rooms/weight room, media center (library), main offices, and district administration offices. The RTUs contain chilled water cooling and hot water heating; hot water piping is insulated and routed through the roof to the heating hot water system. Chilled water piping is insulated and routed over the top of the roof to each unit. Each RTU is mounted on structural steel beams with vibration isolation springs and front and rear duct connections. Supply and return ductwork is routed across the roof and down to roof penetrations, supported by structural framing, and down to the duct distribution system above the ceilings to each space.

Electric heating coils mounted in the supply ductwork provide temperature control for each zone; in addition to the duct mounted electric heating coils in the 700 Block offices, electric baseboard radiators provide heating.

There are issues with AHUs serving the west gym (AHU-7,8) and the east gym (AHU-9,10), which are large units and are operating at full capacity 24/7. These units have hot water connected to them, but not the chilled water to their coils; they are functioning as heating and ventilation units only. Outside air dampers appeared slightly open, return air dampers were fully opened, and the return air path was from a return grille into a storage room that allowed air to migrate from the gym to the mechanical mezzanine above.

AHUs serving the Maintenance 101 and wood shop 103 areas (AHU-6,14, 26) also have issues. These units, located in a mezzanine above Storage 101C, were partially installed, with missing ductwork, wiring, and pipe insulation, and are not operational. Two older hot water heating and ventilation units serve the wood shop, with a manually controlled sidewall exhaust fan for dust removal and ventilation, and a full dust collection system with ducting to shop equipment. Maintenance 101 is being used for grounds maintenance equipment by the school district. Existing heating-ventilating units and fan appear to be stand alone, and not connected to the BAS.

#### 3.3.4 Ceiling Mounted Blower/Coil Air Handling Units

Air handling units AHU-27 through AHU-50 are duct-mounted fan/cooling coil/hot water coil located above the ceiling space being served. These serve rooms in the 100, 200 and 800 block areas. Outside air for these zones is provided by ductwork to each unit.

### 3.3.5 Rooftop Gas Fired Makeup Air Units

Sterling M-Series gas fired packaged rooftop makeup air units (MAUs) installed in 2005 serve Science Rooms in the 200 and 500 blocks, and kitchen 604. Each MAU is mounted on an extended curb with an outside air intake and downflow duct connection for supply ductwork inside the curb. The MAUs contain an indirect-fired natural gas furnace, with no cooling. These units are interlocked with lab hood exhaust fan operation in the science rooms, and cooking hood operation in the kitchen to provide makeup air; gas heat is used to control supply air temperature during winter months.

### 3.3.6 Unit Ventilators

Block classrooms 100, 300, 500, 600 and 700 and Lobby 901are spaces with exterior exposures, and are cooled and heated by vertical floor mounted cabinet UVs. Outside air is drawn through low sidewall louvers, and separate heating and cooling piping systems provide hot water during the heating season, and chilled water during the cooling season. Unit ventilators are controlled by wall mounted thermostats, and integrated into the BAS for monitoring and sequencing.

#### 3.3.7 Hydronic Heating Systems

Other corridors, offices, and the media center are heated by perimeter hot water fintube radiators with wall mounted thermostats. Some HVAC equipment (AHUs, UVs) provide cooling and outside air for these spaces.

The corridors, entrance vestibules, and restrooms are heated by ceiling mounted hot water cabinet unit heaters controlled by space thermostats.

#### 3.3.8 Rooftop Package DX Ducted Systems

One AAON packaged direct expansion (DX) cooling, natural gas heating rooftop unit, RTU-1, serves wood shop 1000 located in the chiller plant building. One Trane packaged DX cooling, natural gas rooftop unit, RTU-2, serves the chiller plant maintenance room 1001; and one AAON packaged DX cooling, electric heating rooftop unit, RTU-3, serves the chiller plant's woodshop computer room 1000A.

It was reported that the systems listed above are not currently used; this equipment is integrated into the Johnson Controls Metasys BAS, and requires re-commissioning and BAS software upgrade to allow shut down during unoccupied schedules (reference ECM-6).

#### 3.3.9 Kitchen Equipment

The cafeteria kitchen contains a 7'x10' walk-in cooler and 5'x7' walk-in freezer, which have water cooled compressors located in Room 604F. The kitchen also contains an additional 10'x10' walk-in freezer with electric air-cooled compressor.

Kitchen ventilation is provided by a single 16'x8' cooking hood with a 5.0 HP fan mounted inside a penthouse ventilator. The fan is constant volume, and gas fired makeup air units MAU-11 and 12 provide makeup air.

### 3.3.10 Exhaust Systems

The 900 Block locker rooms and surrounding offices are exhausted by fans located within the louvered penthouses, which run 24/7. The AHUs that provide make-up air are also constantly operational; the kitchen exhaust fans are turned on/off by hood mounted switches.

There are two large utility type fans on the roof that are not fully installed and have no power. It was reported that these were originally intended to provide "whole building ventilation".

### 3.4 Control Systems

The high school has a Johnson Controls Metasys building automation system; the hot water system, chilled water system, and AHUs are integrated into the BAS for monitoring and sequencing. However, the BAS uses an outdated version of software and is not reliable, allowing only local control of HVAC systems and equipment.

The BAS system and HVAC systems require complete re-commissioning, and either a software upgrade, or another controls vendor overlaid system. The re-commissioning process should include BAS front end system, software upgrade, graphics interface, BAS controllers/field devices, HVAC equipment controllers/components, and HVAC systems dampers, and valves that are not part of equipment. This should be coordinated with a complete systems Testing and Balancing effort that must occur prior to system re-commissioning efforts.

Spaces with heating or cooling issues should be investigated during the re-commissioning process to establish whether there is a control field devices condition/location issue, or zone control temperature setpoint issue to be resolved.

The following is observed HVAC systems operational issues that upgrading and re-commissioning the BAS is intended to resolve:

- Hot water system operates 24/7 on occupied schedule with no scheduling or system temperature reset
- · Chilled water system operates 24/7 on occupied schedule with no scheduling or system temperature reset
- Rooftop cooling and heating AHUs appear to contain full economizer sections and controls; however, it is unclear if economizer modes are operable
- West Gym AHU-7 and 8 and the east gym AHU-9 and 10 are operating at full capacity 24/7; it is also assumed full occupancy design outside air flow is being provided to space
- · AHU-3, 5, 11, and 12 controls and dampers operate in a stand-alone manner
- · It is unclear if duct mounted fan/coil blowers serving individual classrooms and spaces are providing adequate/proper outside air
- $\cdot$  It is unclear if unit ventilators serving individual classrooms and spaces are providing adequate/proper outside air
- · All exhaust system fans operate 24/7 on occupied schedule with no scheduling or nighttime shutdown

### 3.5 Lighting/Electrical Systems

The facility has reballasted and relamped existing fixtures since the building was originally erected. The facility primarily consist of fixtures with T-8 32 watt bulbs, compact fluorescent twin biaxial bulbs,

compact fluorescent spiral bulbs, and older style incandescent bulbs, metal halides, and T-12 in select areas. The primary source of control for the lights is switches which the teachers and custodial staff turn off at the end of the school day. Magnetic ballasts have been upgraded to electronic units.

Exterior lights consist of pole mounted shoe-box type metal halide lights on daylight sensors, and wall pack high pressure sodium fixtures. It was noticed during the field inspection that some lights were on early during the daytime; these fixtures need to have timers adjusted for dusk to dawn. The wall pack lights are powered by the electrical system. The pole lights are operated, maintained, and paid for by the County and are, therefore, were not assessed to identify ECM measures.

### **3.6** Plumbing Systems

#### 3.6.1 Domestic Hot Water Systems

Natural gas tank-type hot water heaters are located throughout the building. The majority of hot water piping appears to be insulated. Domestic hot water temperature is maintained at 140°F, and chemical disinfection soap is provided at the restrooms.

Room 624 (adjacent to Boiler Room 622J) contains one AO Smith 75 gallon high-efficiency natural gas tank type hot water heater. Water demand is primarily for the cafeteria kitchen 600 Block areas and restrooms in the 700 Block rooms.

Room 507 contains one AO Smith 100 gallon high-efficiency natural gas tank hot water heater. Water demand is primarily for the 500 Block rooms. Room 216 contains one AO Smith 100 gallon high-efficiency natural gas tank hot water heater, and demand is primarily for the 200 and 300 Block rooms, which include the science rooms.

The mezzanine above Room 101C contains one AO Smith 100 gallon high-efficiency natural gas tank hot water heater, primarily to satisfy the 100 Block rooms, which includes home economics, wood shop, music, and art classrooms. Mechanical Room 923 contains one 280 gallon indirectly heated domestic hot water storage tank serving the two gyms and the 900 Block of related facilities. Water demand is primarily for locker room showers, but hot water demand is very low as showers are not used.

#### 3.6.2 Plumbing Fixtures

The original lavatories, water closets, and urinals were replaced with low flow plumbing fixtures during the 2005 renovations. All lavatories are 2.5 GPM with push type faucets, water closets are 1.6 GPF, and urinals are 1.0 GPF.

## 4.0 ENERGY CONSERVATION MEASURES

## 4.1 ECM-1 Lighting Replacement/Upgrades

The classrooms have been upgraded to electronic ballast and utilize mainly 4 foot 32W T-8 fluorescent bulbs. A fluorescent lamp converts electrical power into useful light more efficiently than an incandescent lamp or T-12 bulbs. A comprehensive fixture survey was conducted of the entire building. Each switch and circuit was identified, and the number of fixtures, locations, and existing wattage established (Appendix C). There is an opportunity to continue to further reduce consumption by upgrading the classrooms to a super T-8 fixture and the metal halides to a high bay induction fixture.

Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to estimated times of operation. The difference between energy requirements resulted in a total annual savings of 184,800 kWh with an electrical demand reduction of about 53 kW. Supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture, are provided in Appendix C.

Lighting has an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 2,948,400 kWh and \$423,000.

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

Budgetary Cost		Annual Util	ity Savings		Estimated Maintenance	Total Savings	ROI	* NJBPU	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings			Incentive	incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$	\$	\$	Years	Years
284,600	196,560	57	0	28,200	0	28,200	0.5	62,020	10.0	7.9

#### ECM-1 Lighting Replacement/Upgrades

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

This measure is not recommended in lieu of ECM-3.

### 4.2 ECM-2 Lighting Controls (Occupancy Sensors)

The current lighting is controlled by manual switches. Lights are generally turned on in the morning and shut off at night. During occupied times, there are rooms that are not occupied; however, the lights remain on. Adding occupancy sensors to the individual rooms will control the lights based on occupancy. The occupancy sensor can be wall mounted near the switch or placed at the ceiling for larger room coverage. Occupancy sensors are equipped with a manual override feature. These sensors are generally not recommended in public restrooms.

Using a process similar to that utilized in Section 4.1, the energy savings for this measure were calculated by applying the known fixture wattages in the space to the estimated existing and proposed times of operation for each fixture. The difference between the two values resulted in an annual savings of 133,557 kWh. Wall-mounted occupancy sensors with dimmer control are required for this measure.

Occupancy sensors have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 2,003,355 kWh and \$270,000.

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

Budgetary Cost		Annual Util	ity Savings		Estimated Maintenance	Total Savings	ROI	* NJBPU	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings			Incentive	incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
83,300	133,557	0.0	0	18,000	0	18,000	2.2	9,000	4.6	4.1

ECM-2 Lighting Controls (Occupancy Sensors)

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

This measure is not recommended in lieu of ECM-3.

### 4.3 ECM-3 Lighting Replacements with Controls (Occupancy Sensors)

Due to interactive effects, the energy and cost savings for occupancy sensors and lighting upgrades are not cumulative. This measure is a combination of ECM-1 and ECM-2 to reflect actual expected energy and demand reduction.

The lighting retrofits and controls have an expected lifetime of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 4,611,066 kWh and \$625,500.

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

	8 8	<u> </u>								
Budgetary		Annual Util	ity Savings		Estimated	Total			Payback	Payback
Cost			-	-	Maintenance	Savings	ROI	* Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
367,900	307,404	56.8	0	41,700	0	41,700	0.7	71,020	8.8	7.1

ECM-3 Lighting Replacement with Controls (Occupancy Sensors)

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

This measure is recommended.

### 4.4 ECM-4 HVAC Condensing Boiler Addition

The high school is heated with hot water supplied by two cast iron sectional gas fired boilers. These boilers are noncondensing and have an estimated efficiency of 80%.

Due to relatively low efficiency of the two existing boilers, it is recommended to add one high efficiency condensing boiler to operate as the primary boiler during shoulder months (October-November and March-April) with the existing two boilers operating as secondary boilers. The majority of the savings will be achieved during the shoulder months when the lower return water temperature enables the condensing boiler to achieve the highest efficiencies.

The boiler load was calculated from the natural gas used annually per utility bills and boiler efficiency. The load was then compared to the efficiency of a new condensing boiler at the improved operating efficiency. The difference in fuel usage was the savings.

Natural gas-fired boilers have an expected life of 25 years, according to ASHRAE, and total energy savings over the life of the project are estimated at (167,925) therms of natural gas and \$182,500.

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

Budgetary Cost		Annual Utilit	ty Savings	-	Estimated Maintenance	Total Savings	ROI	* NJBPU	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings			Incentive	incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
120,300	0	0.0	6,717	7,300	0	7,300	0.5	3,000	16.5	16.1

ECM-4 HVAC Condensing Boiler Addition

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

This measure is not recommended.

### 4.5 ECM-5 HVAC Hot Water System Control Temperature Reset

Two water cooled centrifugal chillers with a cooling tower provide cooling chilled water, and two sectional gas fired boilers provide heating hot water to the building. Due to the BAS' poor condition and software, the systems operate 24/7 on occupied schedule, constantly providing peak design chilled water and hot water supply temperatures. System control valves are fully open, and system pumps are operating constantly at full flow. Resetting chilled water system temperature during unoccupied and low cooling load conditions reduces needed cooling capacity and chiller plant power draw. Resetting hot water system temperature during unoccupied and low heating load conditions reduces needed heating capacity and boiler plant natural gas consumption. Savings will be achieved by both systems during unoccupied hours when they are operational. Additional savings will be realized during the shoulder cooling and heating months when reduced cooling and heating loads allow system temperature reset during occupied hours.

Bin data was utilized to obtain the annual hours where the hot and chilled water system setpoints could be reset to an unoccupied setpoint. The BTU/Hr rating is calculated from a simple block load calculation which accounts for envelope, ventilation, and internal gain loads. The annual electric and natural gas usages were then compared for the base case and proposed case. The energy savings is the difference in electric and natural gas utilities' usage.

Controls have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 33,300 therms and \$36,000.

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

Budgetary		Annual Util	ity Savings		Estimated	Total			Payback	Payback
Cost		r		1	Maintenance	Savings	ROI	* NJBPU	(without	(with
	Electric	Electric	Nat Gas	Total	Savings			Incentive	incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
11,000	0	0.0	2,220	2,400	0	2,400	2.3	0	4.6	4.6

ECM-5 HVAC Hot Water System Control Temperature Reset

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

This measure is recommended.

#### 4.6 ECM-6 HVAC Chilled Water System Glycol Replacement

A glycol solution is used in the chilled water system, and the current system per cent of glycol concentration in the solution provides freeze protection to 10°F. After the chiller plant is turned off for the year, the chilled water pumps continue to operate during the heating season; the system fluid is circulated to prevent freezing and pipe burst. It is recommended the glycol solution be replaced with the proper percentage of glycol concentration to provide adequate freeze protection. Shutting down the chilled water pumps during the heating season will prevent unnecessary motor electric power consumption. It is assumed the pumps are properly sized to manage the glycol per cent increase since the freeze protection using glycol was part of the original design intent.

The assumption of this calculation is that the pumps' motor horsepower and capacity stay the same. Savings are calculated from the reduction in chilled water pumps run times during the year, and resulting electrical energy savings.

Chilled water system fluid replacement has an expected life of 10 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 1,610,710 kWh and \$217,000.

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

Budgetary Cost	А	nnual Util	ity Saving	s	Estimated Maintenance	Total Savings	ROI	* NJBPU	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings			Incentive	incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
83,600	161,071	0.0	0	21,700	0	21,700	1.6	0	3.9	3.9

ECM-6 HVAC Chilled Water System Glycol Replacement

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

This measure is recommended.

#### 4.7 ECM-7 Replace HVAC Electric Duct Heating Coils

Electric heating coils mounted in the supply ductwork provide temperature control for each zone in the majority of the areas served by the Trane T-Series packaged RTUs, including auditorium, kitchen, cafeteria, 900 block gyms/lockers rooms/weight room, media center (library), main offices and school district administration offices; in addition to the duct mounted electric heating coils in the 700 Block offices and electric baseboard radiators provide heating. The electric resistive heating equipment

consumes electrical energy; the boiler plant can produce the required heating capacity using boilers and less costly natural gas. It is recommended electric resistive heating equipment be replaced with duct mounted hot water reheat coils.

It is assumed the operating hours, number of units, and capacity stay the same. The energy saving is derived from operating higher efficiency, less costly natural gas compared to electricity.

Hot water heating coils have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 11,924,640 kWh, (508,740) therms (natural gas usage replaces electrical usage) and \$1,060,500.

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

					0					
Budgetary Cost		Annual Util	ity Savings		Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Savings				incentive)	incentive)	
\$	kWh kW Therms \$				\$	\$		\$	Years	Years
131,300	794,976	0.0	(33,916)	70,700	0	70,700	7.0	0	1.9	1.9

ECM-7 Replace HVAC Electric Duct Heating Coils

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

This measure is recommended.

#### 4.8 ECM-8 Install Variable Speed Drives, High Efficiency Motors

The hot water system is served by two 20 HP pumps operating in lead-lag, and one 20 HP pump on stand by. The pumps are constant volume with standard efficiency motors.

Air handling units with constant volume supply fan motors serve the auditorium (AHU-1, 2), library (AHU-19, 20) and offices (AHU-22, 23, 24).

Larger motors operating pumps and fans continuously consume significant electrical energy. The hot water system pumps and AHUs operate at constant speed (water and air flows) even though the building load does not require all the flow to maintain temperatures. By adding VSDs and inverter duty motors, and reducing the flow by slowing the motors down, significant electrical energy can be saved. Pressure actuated controllers are used to measure the water or airflow pressure in the HVAC systems and as valves close, the system pressure increases and the fan or pump speed is reduced. Space temperature and carbon dioxide ( $CO_2$ ) sensors are also used to reduce AHU flow when space conditions permit.

For systems that have pumps and /or fans that cannot be slowed down (due to the nature of the system design), electrical saving can still be obtained by replacing older less efficient motors with new higher efficiency motors.

The assumption of this calculation is that the operating hours, motor horsepower, and capacity stay the same. The energy savings are seen from operating higher efficiency motors and reducing power draw with the variable speed drives compared to the existing units.

Motors and variable speed drives have an expected life of 20 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 2,702,200 kWh and \$364,000.

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

Budgetary Cost	А	nnual Util	ity Savings		Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
100,400	135,110	0.0	0	18,200	0	18,200	2.6	16,568	5.5	4.6

ECM-8 Install Variable Speed Drives, High Efficiency Motors

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

This measure is recommended.

### 4.9 ECM-9 HVAC Building Automation System Upgrade/Re-commissioning

The current controls consists of an outdated and unreliable Johnson Controls Metasys BAS for monitoring and sequencing all HVAC systems and equipment. Due to BAS' poor condition and software, HVAC systems operate 24/7 during on occupied schedules; facility unoccupied setback or scheduling, and system temperature reset controls cannot be used. To reduce the energy used by HVAC systems, the BAS and HVAC systems require complete re-commissioning, testing and balancing of all HVAC systems, and either a software upgrade or another controls vendor overlaid system.

The re-commissioned BAS should be capable of enabling the facility operator to perform the following:

- Schedule the HVAC system to maintain higher/lower temperatures during unoccupied times (occupied/unoccupied setback)
- Schedule the lockers, restrooms, and other exhaust system fans to operate only during occupied times; provide system schedules based on building operational schedule (365 day zone scheduling)
- · Control outdoor air dampers based on actual CO<sub>2</sub> levels (demand control ventilation)
- · Control outdoor air dampers to provide economizer cooling vs. mechanical cooling
- · Control discharge air temperature based on actual internal loads (discharge air reset)
- Control chilled water temperature based on outdoor air temperature (chilled water reset)
- Control hot water system temperature based on outdoor air temperature (hot water reset)
- Prioritize the HVAC system start-up time to reduce peak demand (demand load shedding)
- Control the start/stop times and temperatures to match the actual heat gain/loss that the building experiences based on outdoor temperature (optimum start/stop)
- Monitor energy consumption equipment

Additional benefits of this system are that it can provide useful trending information such as daily, monthly, and seasonal energy usage, and alarm messages via the internet indicating that a piece of equipment needs repair or maintenance. The BAS should also allow the facility to monitor the energy consuming equipment in the building remotely in real-time, track the facility energy performance, and remotely adjust setpoints and schedules to optimize the facility operation. Full color graphics and logical programming functions should also be provided.

The annual electrical and natural gas consumption is taken from the utility bills. Per the U.S. Energy Information Administration, the percent of a building's cooling and heating is 26% and 82%, respectively. Utilizing these numbers, the annual electrical and natural gas usage was found; based on project experience retro-commissioning produces a 10% energy saving.

Re-commissioning can have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 1,229,745 kWh, 153,855 therms and \$331,500. It is also noted that to continue to gain this annual savings proper maintenance of equipment needs to take place. While the payback period for this measure does not fall within the normal parameters for recommendation, to allow other ECMs to be implemented effectively warrants that this measure be recommended.

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

Budgetary Cost		Annual Util	ity Savings		Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
246,200	81,983 0.0 10,257 22,100				0	22,100	0.3	0	11.1	11.1

ECM-9 HVAC Building Automation System Upgrade/Re-commissioning

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

This measure is recommended.

### 4.10 ECM-10 HVAC Demand Control Ventilation

Air handling units serve the auditorium (AHU-1, 2), library (AHU-19, 20) and offices (AHU-22, 23, 24). It is assumed the original system controls provide the full design ventilation outside air flow. Reducing outside air during occupied time periods will reduce heating and cooling energy. The quantity of ventilation will be based on maintaining an acceptable  $CO_2$  level in the space as an indicator of indoor air quality. A limit of 1000 PPM of  $CO_2$  is recommended in ASHRAE Standard 62-1982, Ventilation for Acceptable Indoor Air Quality. Sensors will be installed to measure the building air  $CO_2$  concentration, and the control sequence of operation programmed into the BAS. During unoccupied periods, the outside air dampers should be closed.

Bin data was utilized to obtain the annual operating hours required to maintain the current setpoints of 74°F in summer, and 68°F in winter. The BTU/Hr rating is calculated from the outdoor air conditions and CFM. It is assumed that installing controls will reduce the amount of outdoor air to be conditioned by 50%. The annual electric usage was then calculated for the base case and proposed case using respective cooling efficiencies. The energy savings is the difference in electric usage.

Controls have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 218,490 kWh, 180 therms, and \$30,000.

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

Budgetary Cost	1	Annual Utili	ty Savings		Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
35,500	14,566	0.0	12	2,000	0	2,000	(0.2)	0	17.8	17.8

#### **ECM-10HVAC Demand Control Ventilation**

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

This measure is not recommended.

#### 4.11 ECM-11 CoolTrol Walk-in Controls

The high school contains a 7'x10' walk-in cooler, a 5'x7' walk-in freezer and a 10'x10' walk-in freezer.

These three pieces of equipment currently do not have any controls and run continuously throughout the day. It is recommended that the facility installs a CoolTrol Cooler Control System. The benefits include:

- Evaporator fans run 25% to 80% less, saving electricity and reducing compressor run time
- Door and frame heaters are controlled based on space dew point, reducing run time by up to 95% in coolers and 60% in freezers
- Evaporator fan motors are replaced with hi-efficient fan motors saving 40% to 70% in energy

CoolTrol controls have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 1,157,857 kWh and \$156,300.

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

Budgetary Cost		Annual Utilit	ty Savings		Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric Electric Nat Gas Total				Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
37,500	64,325	0.0	0	8,700	0	8,700	3.2	50	4.3	4.3

#### ECM-11 CoolTrol Walk-in Controls

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

This measure is recommended.

#### 4.12 ECM- 12 Variable Speed Kitchen Hood Controls

The kitchen contains a 16'x8' cooking hood with constant volume 5.0 HP fan, and two makeup air units (MAU-11, 12) with 5 HP supply fan motors. It is recommended a variable speed kitchen hood controller be installed to reduce run time of the exhaust fan.

Upon activation, the hood lights turn on and the fans reach a preset minimum speed of between 10% and 50%. When cooking appliances turn on, the fan speed increases based on exhaust air temperature. During actual cooking, the speed increases to 100% until smoke and heat are removed. The controller will send a signal to the kitchen makeup air units to turn on/off the supply fan motor, or modulate the

speed on the supply fan drive based on exhaust air quantity. Variable speed drives with high efficiency inverter duty motors will need to be installed on the exhaust fan and makeup air units supply fans motors.

Reducing exhaust and make-up fan speed will decrease energy consumption. Reducing the supply of summer hot, humid makeup air during idle cooking periods will increase occupant comfort. The system and equipment can also be utilized as an economizer when indoor and outdoor conditions are appropriate for free cooling. The controls also reduce hood noise in the kitchen by up to 90% when the fans slow down. The controls can improve fire safety by monitoring the exhaust air temperature. If the temperature approaches the fusible link rating of the fire suppression system, an alarm can sound and/or the cooking appliances are shut down. This system should also be integrated into the upgraded and re-commissioned Johnson Metasys BAS. Energy savings result from the reduction of exhaust and make-up fan speed.

Kitchen hood controls have an expected life of 18 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 67,446 kWh and \$16,200.

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

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Budgetary Cost	1	Annual Utilit	y Savings		Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric Electric Nat Gas Total				Savings				incentive)	incentive)
\$	kWh kW Therms \$			\$	\$	\$		\$	Years	Years
42,800	3,747	0.0	369	900	0	900	(0.6)	0	>20	>20

ECM-12 Variable Speed Kitchen Hood Controls

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

This measure is not recommended.

### 4.13 System Improvement Opportunities

The following items are system improvements that can be implemented to provide enhanced system operation, energy conservation, or improved indoor spaces conditions.

It was observed that the boiler room is not mechanically ventilated for cooling; the unit heaters that provide winter heating could be equipped with summer fan switches to provide air movement while opening an outside air intake damper. This would be sufficient to provide improved space comfort. The boiler room's exterior doors bottom seals were also worn. The door seals should be replaced.

Chilled water piping penetrating exterior walls from the rooftop to AHUs located in mechanical mezzanines have penetrations that are not sealed around the piping. It is recommended that the pipe openings be sealed and insulated. These mechanical mezzanines also have exterior wall louvers; the wall louvers have no dampers allowing uncontrolled outside air to come into the space. It is recommended that gravity dampers be added to the exterior wall louvers.

During the field inspection, it was observed that piping to some equipment was not insulated. It is recommended this piping be insulated to save heating or cooling energy from being lost to the surrounding space. This also prevents sweating on chilled water piping.

There are issues with the outside air ductwork to air handling units AHU-3, 5, 11, 12; outside air is provided through roof mounted penthouses with gravity dampers. The gravity dampers do not seal well, allowing cold air to enter. One unit utilizes a powered air intake fan located inside one of the louvered penthouses, which runs 24/7. The dampers should be renovated to provide an air-tight seal and prevent outside air into the building when not called for.

For systems that have pumps and/or fans that cannot be slowed down (due to the nature of the system design), ECM-7, Install Speed Drives, High Efficiency Motors cannot be applied. However, electrical saving can still be obtained by replacing older less efficient motors with new high efficiency motors as the equipment ages and requires replacement.

There are six vending machines in the high school. As an energy saving opportunity, it is recommended that vending misers be added to all district owned vending machines. The high school should also request that vendor owned machines be upgraded or removed if they are not high efficiency equipment.

## 5.0 **PROJECT INCENTIVES**

### 5.1 Incentives Overview

### 5.1.1 New Jersey Pay For Performance Program

The facility will be eligible for incentives from the New Jersey Office of Clean Energy. The most significant incentives will be from the New Jersey Pay for Performance (P4P) Program. The P4P program is designed for qualified energy conservation projects in facilities whose demand in any of the preceding 12 months exceeds 200 kW. However, the 200 kW/month average minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). If the participant is a municipal electric company customer, and a customer of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. Available incentives are as follows:

Incentive #1: Energy Reduction Plan – This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP). The standard incentive pays \$0.10 per square foot, up to a maximum of \$50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an initial 75% incentive toward performance of the energy audit, facilities are only eligible for an additional \$0.05 per square foot, up to a maximum of \$25,000, rather than the standard incentive noted above.

Incentive #2: Installation of Recommended Measures – This incentive is based on projected energy saving and designed to pay approximately 60% of the total performance-based incentive. Base incentives deliver \$0.11/kWh and \$1.10/therm not to exceed 30% of total project cost.

Incentive #3: Post-Construction Benchmarking Report – This incentive is paid after acceptance of a report proving energy savings over one year utilizing the Environmental Protection Agency (EPA) Portfolio Manager benchmarking tool. Incentive #3 base incentives deliver \$0.07/kWh and \$0.70/therm not to exceed 20% of total project cost.

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

Under incentive #1 of the New Jersey Pay for Performance Program, the 232,931 square foot high school building is eligible for about \$1,400 toward development of an Energy Reduction Plan. When calculating the total amount under Incentives #2 and #3, all energy conservation measures are applicable as the amount received is based on site wide energy improvements. Since the overall energy reduction for the complex is estimated to exceed the 15% minimum, the building is eligible to receive monies based on Incentives #2 and #3 as discussed above in section 5.1.1. In total, incentives through the NJ P4P program are expected to total about \$470,384, reducing the total project payback from 4.3 years to 2.5 years. See Appendix D for calculations.

5.1.2 New Jersey Smart Start Program

For this program, specific incentives for energy conservation measures are calculated on an individual basis utilizing the 2011 New Jersey Smart Start incentive program. This program provides incentives dependent upon mechanical and electrical equipment. If applicable, incentives from this program are reflected in the ECM summaries and attached appendices.

If the complex qualifies and enters into the New Jersey Pay for Performance Program, all energy savings will be included in the total site energy reduction, and savings will be applied towards the Pay for Performance incentive. A project is not applicable for both New Jersey incentive programs.

### 5.1.3 Direct Install Program

The Direct Install Program targets small and medium sized facilities where the peak electrical demand does not exceed 150 kW in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility companies. On a case-by-case basis, the program manager may accept a project for a customer that is within 10% of the 150 kW peak demand threshold.

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

The program pays 70% of each project cost up to \$75,000 per electrical utility account; total funding for each year is capped at \$250,000 per customer. Installations must be completed by a Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website at http://www.njcleanenergy.com. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document.

The facility is potentially eligible to receive funding from the Direct Install Program. The total implementation cost for all ECMs potentially eligible for Direct Install funding is \$575,554, and includes demand control ventilation, temperature setback, premium efficiency motors and upgrades to the lighting system. The program normally has a potential to pay 70% of the initial costs, leaving 30% to be paid out of pocket. However, funding is capped at \$250,000 so that would be the maximum amount available. Direct Install funding has the potential to significantly reduce the payback period of Energy Conservation Measures.

## 6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

### 6.1 Solar

#### 6.1.1 Photovoltaic Rooftop Solar Power Generation

The facility was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The building's roof has sufficient room to install a large solar cell array. All rooftop areas have been replaced, and are in good condition making them a suitable candidate for a solar PV array installation.

The PVWATTS solar power generation model was utilized to calculate PV power generation. The closest city available in the model is Atlantic City, New Jersey and a fixed tilt array type was utilized to calculate energy production. The PVWATT solar power generation model is provided in Appendix P.

Federal tax credits are available for renewable energy projects up to 30% of installation cost. Since the facility is a non-profit organization, federal taxes are paid and this project is eligible for this incentive.

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey solar renewable energy certificates program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. Payments that will be received from the PV producer will change from year to year dependent upon supply and demand. Renewable Energy Consultants is a third party SREC broker that has been approved by the New Jersey Clean Energy Program. There is no definitive way to calculate an exact price that will be received by the PV producer per SREC over the next 15 years. The cost of the ACP penalty for 2011 was \$600; this is the amount that must be paid per SREC by the high emission producers. Unfortunately, the dollar amount that will be paid to the PV producer for 2012 has been reduced to only \$95/SREC credit, thus reducing the available incentive to install a PV.

From July 2010 through June 2011, the West Essex Regional School District High School had a maximum electricity demand of 634.2 kW and a minimum of 479.2 kW. The monthly average over the observed 12 month period was 566.7 kW. The existing load justifies the use of 550 kW PV solar array; however, max incentives from the New Jersey SREC program can only be applied to a maximum system size of 50 kW. The system costs for PV installations were derived from contractor budgetary pricing in the state of New Jersey for estimates of total cost of system installation. It should be noted that the cost of installation is currently about \$8.00 per watt or \$8,000 per kW of installed system, for a 50 kW system. Other cost considerations will also need to be considered. PV panels have an approximate 20 year life span; however, the inverter device that converts DC electricity to AC has a life span of 10 to 12 years and will need to be replaced multiple times during the useful life of the PV system.

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

Budgetary Cost	Annu	Annual Utility Savings				Federal Tax Credit *	New Jersey Renewable SREC**	Payback (without incentive)	Payback (with incentives)
	Electricity		Natural Gas	Total					
\$	kW	kWh	Therms	\$	\$	\$	\$	Years	Years
400,000	0 62,516 0 8,400		8,400	0	5900	>20	>20		

Photovoltaic (PV) Rooftop Solar Power Generation – 50 kW System

\* Federal Tax Credit of 30% is only applicable to organizations that pay Federal taxes

\*\* Estimated Solar Renewable Energy Certificate Program (SREC) for 15 years at \$487/1000 kWh

At 100 square feet per kW of PV panels (rule of thumb), the proposed PV power generation system would require 50,000 square feet of open space. This measure is recommended because the PV panels can be installed on the rooftop and transmission lines can be routed to an interior PV equipment room or yard (load bank, inverter, etc.); the distances will be short and have a direct route which will minimize installation cost.

### 6.1.2 Solar Thermal Hot Water Plant

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

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

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

Currently, an incentive is not available for installation of thermal solar systems; a Federal tax credit of 30% of installation cost for the thermal applications is available. This is not recommended since the facility currently uses natural gas, the building is not occupied year-round, and domestic hot water demand is not excessive.

#### 6.2 Demand Response Curtailment

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

Utility Curtailment is an agreement with the utility provider's regional transmission organization and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and utility provider offers incentives to the CSP to participate in this program. Enrolling in the program will require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. Part of the program also will require that program participants reduce their required load or run emergency generators with notice to test the system.

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From July 2010 through June 2011, the West Essex Regional School District High School had a maximum electricity demand of 634.2 kW and a minimum of 479.2 kW. The monthly average over the observed 12 month period was 566.7 kW.

This measure is not recommended because the facility is not operating year round, and the building does not have back up/emergency generator power.

## 7.0 EPA PORTFOLIO MANAGER

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

The Site EUI is the amount of heat and electricity consumed by a building as reflected in utility bills. Site energy may be delivered to a facility in the form of primary energy, which is raw fuel burned to create heat or electricity (such as natural gas or oil), or as secondary energy, which is the product created from a raw fuel (such as electricity or district steam). Site EUI is a measure of a building's annual energy utilization per square foot. Site EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types.

#### Site Energy Intensity = <u>(Electric Usage in kBtu + Natural Gas in kBtu)</u> Building Square Footage

To provide an equitable comparison for different buildings with varying proportions of primary and secondary energy consumption, the Portfolio Manager uses the convention of Source EUIs. The source energy also accounts for all losses incurred in production, storage, transmission, and delivery of energy to the site; which provides an equivalent measure for various types of buildings with different energy sources.

#### Source Energy Intensity = (Electric Usage in kBtu X Site/Source Ratio + Natural Gas in kBtu X Site/Source Ratio) Building Square Footage

Energy Intensity	West Essex RSD High School	National Average
EPA Score	32	50
Site (kBtu/sf/year)	110	94
Source (kBtu/sf/year)	221	189

The EPA Score, Site EUI, and Source EUI for West Essex High School are as follows:

The West Essex High School is considered a higher than average energy consumer by the EPA Portfolio Manager which gives it a lower than average EPA score. For the West Essex High School to qualify for the Energy Star label the EPA score is required to be above 75. There are several energy conservation measures recommended in this report, that if implemented will further reduce the energy use intensity and increase the EPA score of the high school.

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

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

The user name and password for the building's EPA Portfolio Manager Account has been provided to Michael Falkowski, Board Secretary for the West Essex Regional School District.

### 8.0 CONCLUSIONS & RECOMMENDATIONS

The energy audit conducted by CHA at the West Essex Regional School District in North Caldwell, New Jersey identified potential ECMs for lighting and control replacement, water system control temperature reset, chilled water system glycol replacement, and variable speed drives. Building automation system upgrades, re-commissioning and walk-in freezer controls were also assessed. Potential annual savings of \$185,500 may be realized for the recommended ECMs, with a summary of the costs, savings, and paybacks as follows:

Budgetary Cost		Annual Util	ity Savings		Estimated Maintenance	Total Savings	ROI	* Incentive	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
367,900	307,404	56.8	0	41,700	0	41,700	0.7	71,020	8.8	7.1

ECM-3	Lighting Replacement with Controls (Occupancy Sensors)
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\* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities.

#### ECM-5 HVAC Hot Water System Control Temperature Reset

Budgetary Cost		Annual Util	lity Savings		Estimated Maintenance	Total Savings	ROI	* NJBPU	Payback (without	Payback (with
	Electric	Electric Electric Nat Gas Total						Incentive	incentive)	incentive)
\$	kWh kW Therms \$				\$	\$		\$	Years	Years
11,000	0 0.0 2,220 2,400				0	2,400	2.3	0	4.6	4.6

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

#### ECM-6 HVAC Chilled Water System Glycol Replacement

Budgetary Cost	An	Annual Utility Savings			Estimated Maintenance	Total Savings	ROI	* NJBPU	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings			Incentive	incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
83,600	161,071	0.0	0	21,700	0	21,700	1.6	0	3.9	3.9

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

#### ECM-7 Replace HVAC Electric Duct Heating Coils

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
131,300	794,976	0.0	(33,916)	70,700	0	70,700	7.0	0	1.9	1.9

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

#### ECM-8 Install Variable Speed Drives, High Efficiency Motors

Budgetary Cost	Annual Utility Savings		Annual Utility Savings Estimated Maintenance		Total Savings	ROI	*Incentive	Payback (without	Payback (with	
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
100,400	135,110	0.0	0	18,200	0	18,200	2.6	16,568	5.5	4.6

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

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
246,200	81,983	0.0	10,257	22,100	0	22,100	0.3	0	11.1	11.1

ECM-9	HVAC Building	Automation	System I	Ingrade/Re-	commissioning
	II , II C Dunuing	1 acomation	System C	por uuc, ne	commissioning

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

#### ECM-11 CoolTrol Walk-in Controls

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	*Incentive	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
37,500	64,325	0.0	0	8,700	0	8,700	3.2	50	4.3	4.3

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

# APPENDIX A

Utility Usage Analysis

West Essex Schools 65 W Greenbrook Rd North Caldwell, NJ

# Electric Service Delivery - PSEG Supplier - PSEG/INTEGRYS

For Service at:65 W Greenbrook Rd., North Caldwell TWP, NJ, 07006-4758Account No.:42 004 217 04 (High School Building)Meter No.:778017386

				Unit Costs							
	Consumption	Demand	Total	Delivery	Supply	Blen	ded Rate	Cons	sumption	De	emand
Month	(kWh)	(kW)	(\$)	(\$)	(\$)	(\$	/kWh)	(\$	/kWh)	(3	\$/kW)
July-10	262,342	634.20	\$36,988.36	\$13,606.47	\$23,381.89	\$	0.141	\$	0.107	\$	14.06
August-10	271,524	479.20	\$40,918.48	\$12,600.83	\$28,317.65	\$	0.151	\$	0.124	\$	15.16
September-10	250,432	501.50	\$33,101.35	\$12,353.15	\$20,748.20	\$	0.132	\$	0.102	\$	14.96
October-10	268,941	627.10	\$35,293.87	\$8,534.43	\$26,759.44	\$	0.131	\$	0.126	\$	2.23
November-10	223,866	531.30	\$29,458.14	\$7,183.56	\$22,274.58	\$	0.132	\$	0.126	\$	2.34
December-10	252,010	502.70	\$32,989.83	\$7,915.04	\$25,074.79	\$	0.131	\$	0.126	\$	2.38
January-11	307,962	610.30	\$40,356.57	\$9,714.53	\$30,642.04	\$	0.131	\$	0.126	\$	2.58
February-11	285,832	612.40	\$36,827.09	\$8,387.00	\$28,440.09	\$	0.129	\$	0.124	\$	2.24
March-11	284,336	595.10	\$36,617.24	\$8,322.97	\$28,294.27	\$	0.129	\$	0.124	\$	2.26
April-11	273,306	560.70	\$35,256.16	\$8,062.31	\$27,193.85	\$	0.129	\$	0.124	\$	2.30
May-11	216,552	575.00	\$28,614.90	\$7,068.16	\$21,546.74	\$	0.132	\$	0.126	\$	2.28
June-11	256,103	570.70	\$39,813.86	\$14,331.81	\$25,482.05	\$	0.155	\$	0.126	\$	13.19
Total (All)	3,153,206	634.20	\$426,235.85	\$118,080.26	\$308,155.59	\$	0.135	\$	0.122	\$	6.17

	Integrys supply PSEG Supply								
July-10									
August-10									
September-10									
October-10	\$	26,759.44	\$	21,489.61					
November-10	\$	22,274.58	\$	13,755.23					
December-10	\$	25,074.79	\$	15,064.34					
January-11	\$	30,642.04	\$	27,638.03					
February-11	\$	28,440.09	\$	25,299.96					
March-11	\$	28,294.27	\$	20,391.85					
April-11	\$	27,193.85	\$	17,859.64					
May-11	\$	21,546.74	\$	16,513.58					
June-11	\$	25,482.05	\$	22,275.16					
Total	\$	235,707.85	\$	180,287.40					
"Savings"	\$	(55,420.45)							

Utility Data - West Essex HS Electric 778017386, HS Building

### 65 W Greenbrook Rd., North Caldwell TWP, NJ, 07006-4758 High School Building Electric Meter #778017386



West Essex Schools 65 W Greenbrook Rd North Caldwell, NJ Natural Gas ServiceDelivery -PSEGSupplier -PSEG

For Service at:65 W Greenbrook Rd., North Caldwell TWP, NJ, 07006-4758Account No.:64 115 534 03, High School Building

Meter No.:

2807073

	THERMS	Delivery		Supply		Total	Unit Cost
Month							(\$/Therm)
July-10	535.641	\$ 156.91	\$	380.31	\$	692.55	\$1.29
August-10	280.752	\$ 136.13	\$	253.95	\$	390.08	\$1.39
September-10	302.427	\$ 142.05	\$	235.28	\$	377.33	\$1.25
October-10	441.169	\$ 162.87	\$	291.73	\$	454.60	\$1.03
November-10	8,527.884	\$ 5,437.39	\$	5,793.99	\$	11,231.38	\$1.32
December-10	9,165.800	\$ 3,116.37	\$	5,740.18	\$	8,856.55	\$0.97
January-11	38,329.671	\$ 15,091.29	\$	21,230.43	\$	36,321.72	\$0.95
February-11	27,458.858	\$ 9,195.88	\$	19,836.03	\$	29,031.91	\$1.06
March-11	24,766.007	\$ 8,573.69	\$	17,967.88	\$	26,541.57	\$1.07
April-11	17,764.962	\$ 1,986.51	\$	12,128.58	\$	14,115.09	\$0.79
May-11	5,723.828	\$ 705.77	\$	4,161.03	\$	4,866.80	\$0.85
June-11	951.768	\$ 233.29	\$	703.16	\$	936.45	\$0.98
Total (All)	134,249	\$ 44,938.15	88	3722.54511	\$	133,816.033	\$1.08
### 65 W Greenbrook Rd., North Caldwell TWP, NJ, 07006-4758 High School Building NG Meter #2807073



Utility Data - West Essex HS G-Chart 2807073, HS Building

## **APPENDIX B**

**Equipment Inventory** 

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size/Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
Cooling Chilled Water Chillers	2	Trane	Centravac CVHE500	#1: L04J04369 #2: L04K04526	Cooling (R123A) / Electric	500 tons / 20.76 EER	Chiller Plant Building	High School	2005	17	Centrifugal duplex; Good Condition
Cooling Chilled Water Pumps	3	Bell & Gossett	SERIES 1510 Size 5E	-	Primary Loop Pumps / Electric	50 HP / 1,725 RPM / Premium Eff.	Chiller Plant Buildnig	Variable flow chiller CHW loop / High School	2005	13	Good Condition
Cooling Chilled Water Cooling Tower	1	Baltimore Air Coil	3358A-2	U040612901	Cooling / 2-Cell Air- Cooled Tower with VSD Fans	500 tons	Behind Chiller Plant Building	High School	2005	13	Good Condition
Cooling Condenser Water Pumps	3	Bell & Gossett	SERIES 1510 Size 5G	-	Condenser Water Loop Pumps / Electric	20 HP / 1,725 RPM / Premium Eff.	Chiller Plant Building	Variable flow cooling tower condenser water loop	2005	13	Good Condition
Heating Hot Water Boilers	2	Universal Boiler Works	BF250-W4	#1: 15553-1 #2: 15553-2	Heating / Natrual Gas	10,460,000 Btuh / 80% Eff.	Boiler Room 622J	High School	1995	18	Cast-Iron Section; Good Condition
Heating Hot Water Pumps	3	Armstrong	SERIES 4030 6x5x10	#1: 96254 #2: 96255 #3: 96254	Primary Loop Pump / Electric	20 HP / 1,760 RPM / Standard Eff., 86.5%	Boiler Room 622J	Constant Volume boilers HHW loop / High School	1995	3	Good Condition
Domestic Hot Water Heater	1	A.O. Smith	Legend Model C11275	C0611275	Domestic Hot Water Heating / Natural Gas	75 Gallon / 150,000 Btuh / 96% Eff.	Boiler Room 622J	High School 600 & 700 Block Rooms	2005	5	Good Condition
Domestic Hot Water Heater	1	A.O. Smith	Cyclone Model BTH300A100	1028M001868	Domestic Hot Water Heating / Natural Gas	100 Gallon / 300,000 Btuh / 96% Eff.	Room 507	High School 500 Block Rooms	2005	5	Good Condition
Domestic Hot Water Heater	1	A.O. Smith	BTH250A970	K06M003943	Domestic Hot Water Heating / Natural Gas	100 Gallon / 240,000 Btuh / 96% Eff.	Room 216	High School 200 & 300 Block Science Rooms	2005	5	Good Condition
Domestic Hot Water Heater	1	A.O. Smith	BTH250A970	M05000613	Domestic Hot Water Heating / Natural Gas	100 Gallon / 240,000 Btuh / 96% Eff.	Room 216	High School 100 Block Shops, Foods and Maintenance Rooms	2005	5	Good Condition
Domestic Hot Water Storage Tank	1	-	-	-	Domestic Hot Water Storage / Hot Water	~280 Gallon / 6' Round x 10' long	Mech Room 923	High School 900 Block Locker Rooms & Restrooms	1961	-	Good Condition
AHU-1	1	Trane	TSCA021U0C00000 0000A00A166.0	K04D56998	HVAC / Chilled Water Cooling, Hot Water Heating	9000 CFM / CLG: 378.4 MBH, HTG: 264 MBH / 3.0 HP supply fan	100 Block Rooftop	Auditorium 123	2005	8	Fair Condition
AHU-2	1	Trane	TSCA021U0C00000 0000A00A166.0	K04D56978	HVAC / Chilled Water Cooling, Hot Water Heating	9000 CFM / CLG: 378.4 MBH, HTG: 264 MBH / 3.0 HP supply fan	300 Block Rooftop	Auditorium 123	2005	8	Fair Condition
AHU-3	1	Trane	LPCAA08F1D0DAM0 00004FATE01	T04E30878	HVAC / Chilled Water Cooling, Hot Water Heating	3550 CFM / CLG: 120 MBH, HTG: 76.4 MBH / 3.0 HP supply fan	600 Block Mezzanine	Kitchen Areas	2005	8	Good Condition
AHU-4	1	Trane	LPCAA12F1D0CAL0 00004GAFE01	T04E30880	HVAC / Chilled Water Cooling, Hot Water Heating	5550 CFM / CLG: 210 MBH, HTG: 162.8 MBH / 5.0 HP supply fan	600 Block Mezzanine	Pink Café 600	2005	8	Good Condition
AHU-5	1	Trane	LPCAA12F1D0CAL0 00004GAFE01	T04E30880	HVAC / Chilled Water Cooling, Hot Water Heating	5550 CFM / CLG: 198 MBH, HTG: 162.5 MBH / 5.0 HP supply fan	600 Block Mezzanine	Blue Café 606	2005	8	Good Condition

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size/Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
AHU-6	1	Trane	-	-	HVAC / Chilled Water Cooling, Hot Water Heating	2400 CFM / CLG: 90 MBH, HTG: 75 MBH / 1.5 HP supply fan	100 Block Mezzanine	NOT CONNECTED	2005	8	Good Condition
AHU-7	1	Trane	LPCAF17F1D0CAH0 0000004HADB01000 000000	T04F35774	HVAC / Chilled Water Cooling, Hot Water Heating	8000 CFM / CLG: 192 MBH, HTG: 147 MBH / 7.5 HP supply fan	900 Block Mezzanine	West Gym 930	2005	8	Good Condition
AHU-8	1	Trane	LPCAF17F1D0CAH0 0000004HADB01000 000000	T04F35775	HVAC / Chilled Water Cooling, Hot Water Heating	2400 CFM / CLG: 90 MBH, HTG: 75 MBH / 7.5 HP supply fan	900 Block Mezzanine	West Gym 930	2005	8	Good Condition
AHU-9	1	Trane	LPCAF10F1D00CBK 00000004GAN	T04F35776	HVAC / Chilled Water Cooling, Hot Water Heating	10000 CFM / CLG: 240 MBH, HTG: 234 MBH / 10.0 HP supply fan	900 Block Mezzanine	East Gym 900	2005	8	Good Condition
AHU-10	1	Trane	LPCAF21F1D00CBK 00000004GAN	T04F35782	HVAC / Chilled Water Cooling, Hot Water Heating	10000 CFM / CLG: 240 MBH, HTG: 234 MBH / 10.0 HP supply fan	900 Block Mezzanine	East Gym 900	2005	8	Good Condition
AHU-11	1	Trane	LPCAF08F1D0RCK0 0000004GAW	T04F35777	HVAC / Chilled Water Cooling, Hot Water Heating	4200 CFM / CLG: 180 MBH, HTG: 198.3 MBH / 5.0 HP supply fan	900 Block Mezzanine	Girls Locker Room 922 Areas	2005	8	Good Condition Not Connected
AHU-12	1	Trane	LPCAF21F1D00CBK 00000004GAN	T04F35779	HVAC / Chilled Water Cooling, Hot Water Heating	5000 CFM / CLG: 240 MBH, HTG: 266.5 MBH / 5.0 HP supply fan	900 Block Mezzanine	Boy's Locker Room 916 Areas	2005	8	Good Condition
AHU-14	1	Trane	-	-	HVAC / Chilled Water Cooling, Hot Water Heating	3400 CFM / CLG: 120 MBH, HTG: 110 MBH / 3.0 HP supply fan	100 Block Mezzanine	NOT CONNECTED	2005	8	Good Condition
AHU-15	1	Trane	TSCA006U0C00000 0000A00A170.8	K04D56998	HVAC / Chilled Water Cooling, Hot Water Heating	2600 CFM / CLG: 90 MBH, HTG: 75 MBH / 3.0 HP supply fan	100 Block Rooftop	Wood Shop 103	2005	8	Fair Condition
AHU-16	1	Trane	TSCA008U0C00000 0000A00A158.2	K04D57006	HVAC / Chilled Water Cooling, Hot Water Heating	1700 CFM / CLG: 66 MBH, HTG: 40 MBH / 3.0 HP supply fan	100 Block Rooftop	Maintenance 101	2005	8	Fair Condition
AHU-17	1	Trane	TSCA006U0C00000 0000A00A170.8	K04D57014	HVAC / Chilled Water Cooling, Hot Water Heating	4480 CFM / CLG: 180 MBH, HTG: 132.5 MBH / 5.0 HP supply fan	100 Block Mezzanine	Stage 123A	2005	8	Good Condition
AHU-18	1	Trane	TSCA010U0C00000 0000A00A140.5	K04D57015	HVAC / Chilled Water Cooling, Hot Water Heating	2500 CFM / CLG: 90 MBH, HTG: 50 MBH / 2.0 HP supply fan	100 Block Mezzanine	Control Room 111B & Studios 111C	2005	8	Good Condition
AHU-19	1	Trane	TSCA0017U0C0000 00000A00A161.5	K04D57028	HVAC / Chilled Water Cooling, Hot Water Heating	8000 CFM / CLG: 221.4 MBH, HTG: 202 MBH / 7.5 HP supply fan	500 Block Rooftop	Media Center / Hub Room 512	2005	8	Fair Condition
AHU-20	1	Trane	TSCA008U0C00000 0000A00A165.0	K04D57036	HVAC / Chilled Water Cooling, Hot Water Heating	3500 CFM / CLG: 120 MBH, HTG: 68 MBH / 5.0 HP supply fan	500 Block Rooftop	Media Center Areas 502,510,512	2005	8	Fair Condition
AHU-21	1	Trane	TSCA006U0C00000 0000A00A154.5	K04D57049	HVAC / Chilled Water Cooling, Hot Water Heating	3.0 HP supply fan	600 Block Rooftop	Nurse 630 & Gym Lobby 902	2005	8	Fair Condition
AHU-22	1	Trane	TSCA006U0C00000 0000A00A170.8	-	HVAC / Chilled Water Cooling, Hot Water Heating	5000 CFM / CLG: 180 MBH, HTG: 127.6 MBH / 7.5 HP supply fan	300 Block Rooftop	Board of Eduation Office Suites 313,315,317	2005	8	Good Condition
AHU-23	1	Trane	TSCA008U0C00000 0000A00A165.0	K04D56817	HVAC / Chilled Water Cooling, Hot Water Heating	3800 CFM / CLG: 120 MBH, HTG: 71.6 MBH / 7.5 HP supply fan	400 Block Rooftop	Principal's Offices 401	2005	8	Fair Condition
AHU-24	1	Trane	TSCA008U0C00000 0000A00A165.0	K04D56817	HVAC / Chilled Water Cooling, Hot Water Heating	3500 CFM / CLG: 120 MBH, HTG: 87.7 MBH / 5.0 HP supply fan	400 Block Rooftop	Guidance Offices 402	2005	8	Fair Condition

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size/Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
AHU-25	1	Trane	-	-	HVAC / Electric DX Cooling	2600 CFM / CLG: 60 MBH / 3.0 HP supply fan	700 Block Rooftop	Offices 700 thru 704B	2005	8	Good Condition
AHU-26	1	Trane	-	-	HVAC / Chilled Water Cooling, Hot Water Heating	1200 CFM / CLG: 36 MBH, HTG: 28 MBH / 1.5 HP supply fan	100 Block Mezzanine	NOT CONNECTED	2005	8	Good Condition
AHU-27 thru AHU-50 & AHU-55	26	Trane	Duct-mounted fan blower with duct mounted heating and cooling coils	-	HVAC / Chilled Water Cooling, Hot Water Heating	Varies fractional HP fan motors, (2) fans at max of 1.5 HP	Above Ceiling in Space Being Served	Various	2005	8	Good Condition
AHU-51	1	Trane	TSCA006U0C00000 0000A00A143.5	K04D56842	HVAC / Chilled Water Cooling, Hot Water Heating	2100 CFM / CLG: 84 MBH, HTG: 56.3 MBH / 1.5 HP supply fan	900 Block Rooftop	Weight Room 904	2005	8	Fair Condition
AHU-52	1	Trane	TSCA006U0C00000 0000A00A143.5	K04D56849	HVAC / Chilled Water Cooling, Hot Water Heating	2190 CFM / CLG: 100.4 MBH, HTG: 73 MBH / 1.5 HP supply fan	900 Block Rooftop	Locker Rooms 916 & 922	2005	8	Fair Condition
AHU-53	1	Trane	TSCA006U0C00000 0000A00A143.5	K04D56855	HVAC / Chilled Water Cooling, Hot Water Heating	2000 CFM / CLG: 80 MBH, HTG: 91.8 MBH / 1.5 HP supply fan	900 Block Rooftop	Team Rooms 906,924,926,928 & Misc. Areas	2005	8	Fair Condition
AHU-54	1	Trane	TSCA006U0C00000 0000A00A143.5	K04D56862	HVAC / Chilled Water Cooling, Hot Water Heating	2400 CFM / CLG: 108 MBH, HTG: 89 MBH / 2.0 HP supply fan	900 Block Rooftop	Mutilpurpose Room 910	2005	8	Fair Condition
MAU-1	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477914001003	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	500 Block Rooftop	Science 507	2005	8	Fair Condition
MAU-2	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477914001005	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	500 Block Rooftop	Science 509	2005	8	Fair Condition
MAU-3	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477914001004	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	500 Block Rooftop	Science 511	2005	8	Fair Condition
MAU-4	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477914001002	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	500 Block Rooftop	Science 513	2005	8	Fair Condition
MAU-5	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477914001001	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	500 Block Rooftop	Science 515	2005	8	Fair Condition
MAU-6	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477953001005	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	200 Block Rooftop	Science 211	2005	8	Fair Condition
MAU-7	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477953001004	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	200 Block Rooftop	Science 207	2005	8	Fair Condition
MAU-8	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477953001002	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	200 Block Rooftop	Science 208	2005	8	Fair Condition
MAU-9	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477953001003	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	200 Block Rooftop	Science 204	2005	8	Fair Condition
MAU-10	1	Sterling	M1K- RT10C1C01F61K2A B4E1E4F1H3J1	E04477953001001	N.G. Heating / Science Lab Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	200 Block Rooftop	Prep Room 206	2005	8	Fair Condition
MAU-11	1	Sterling	M1K- RT40A1B01F61R2A B4E1E4	E04477914004002	N.G. Heating / Science Kitchen Hood Makeup Air Unit	5000 CFM / HTG: 300 MBH / 5.0 HP supply fan	600 Block Rooftop	Kitchen 604	2005	8	Fair Condition

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size/Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
MAU-12	1	Sterling	M1K- RT40A1B01F61R2A B4E1E4	E04477914004001	N.G. Heating / Science Kitchen Hood Makeup Air Unit	5000 CFM / HTG: 300 MBH / 5.0 HP supply fan	600 Block Rooftop	Kitchen 604	2005	8	Fair Condition
MAU-13	1	Sterling	M1K- RT40A1B01F61R2A B4E1E4	E04477914004001	N.G. Heating / Science Kitchen Hood Makeup Air Unit	770 CFM / HTG: 50 MBH / 0.75 HP supply fan	600 Block Rooftop	Science 201	2005	8	Fair Condition
UV-1 thru UV-51	51	Trane	VUVC	-	HVAC / Hot Water Heating	Fractional HP fan motors, max size 0.25 HP	Vertical unit ventilator floor mounted cabinet	Exterior Classrooms and Spaces	2005	13	Good to Fair Condition
CH-1 thru CH-17	20	Trane	(13) FFEB02 (7) FFEB06	-	HVAC / Hot Water Heating	0.03 HP for size 02 0.12 HP for size 06	Horizontal cabinet heater, ceiling mounted	Corridors, Entrance Vestibules and Toilets	2005	13	Good Condition
FTR-1 thru FTR-11	14	-	-	-	HVAC / Hot Water Heating	410 feet of 3/4" tube size, 40 fins/inch, 180°F HWS & 1300 BTU/hr/ft	Horizontal fin tube radiation, lower walls	Corridors, Offices and Media Center	-	-	Good Condition
RTU-1	1	AAON Inc.	RM-007-3-0-AA01- 222-A000D	200408- AMGG11390	HVAC / Electric DX Cooling, N.G. Heating	2.0 HP supply fan	Chiller Plant Building Roof	Wood Shop 1000	2005	8	Not Used
RTU-2	1	Trane	CRAA10GEFE0N2C D105E0CV5	F04H09481	HVAC / Electric DX Cooling, N.G. Heating	1.5 HP supply fan	Chiller Plant Building Roof	Maintenance 1001	2005	8	Not Used
RTU-3	1	AAON Inc.	RM-002-3-0-AA01- 111-A000A	200408- AMEB03075	HVAC / Electric DX Cooling, N.G. Heating	0.5 HP supply fan	Chiller Plant Building Roof	Woodshop Computer Room1000A	2005	8	Not Used
RTU-4	1		DL-06N12NTAAA3D	N0D9692209	HVAC / Electric DX Cooling, N.G. Heating	0.5 HP supply fan / 9.0 EER	300 Block Rooftop	Special Services Room 313	2005	8	Good Condition
Duct Mounted Electric Heating Coils	14	Indeeco	QUZ (1.5, 2.0, 3.0 & 4.0 KW UNITS)	-	HVAC / Electric Heating	71.0 KW total at 120/1/60	Duct mounted heating coils	Various	2005	3	Good Condition
Duct Mounted Electric Heating Coils	22	Indeeco	QUZ (1.5, 2.0, 3.0 & 4.0 KW UNITS)	-	HVAC / Electric Heating	91.0 KW total at 460/3/60	Duct mounted heating coils	Various	2005	3	Good Condition
Electric Baseboard Heat	4	-	-	-	HVAC / Electric Heating	20.0 KW total at 460/3/60	In Space Being Served	700 Block Offices	2005	3	Good Condition
Cafeteria Kitchen Walk-in Cooler	1	Bally	-	-	7'x10' Walk-in Cooler / Water Cooled	-	Kitchen	-	-	-	Good Condition
Cafeteria Kitchen Walk-in Freezer	1	Bally	-	-	5'x7' Walk-in Freezer / Water Cooled	-	Kitchen	-	-	-	Good Condition
Cafeteria Kitchen Walk-in Freezer	1	Bally	-	-	10'x10' Walk-in Freezer / Electric DX	-	Kitchen	-	-	-	Good Condition
Cafeteria Dishwasher	1	Jackson	AJ44CE	-	Appliance / Hot Water	-	Kitchen	-	-	-	Good Condition
Vending Machines	6	Various	-	-	Vending / Elextric DX	-	Various	-	-	-	Good Condition

Tag	Manufactuer	Model	Elec.	KW
22-1	Indeeco	QUZ	460/3/60	6.0
22-2	Indeeco	QUZ	460/3/60	8.0
22-3	Indeeco	QUZ	460/3/60	8.0
22-4	Indeeco	QUZ	460/3/60	6.0
22-5	Indeeco	QUZ	460/3/60	8.0
22-6	Indeeco	QUZ	460/3/60	4.0
23-1	Indeeco	QUZ	120/1/60	2.0
23-2	Indeeco	QUZ	460/3/60	7.0
23-3	Indeeco	QUZ	120/1/60	5.0
23-4	Indeeco	QUZ	120/1/60	5.0
23-5	Indeeco	QUZ	460/3/60	8.0
23-6	Indeeco	QUZ	120/1/60	5.0
24-1	Indeeco	QUZ	120/1/60	3.0
24-2	Indeeco	QUZ	120/1/60	2.0
24-3	Indeeco	QUZ	120/1/60	3.0
24-4	Indeeco	QUZ	120/1/60	3.0
24-5	Indeeco	QUZ	120/1/60	3.0
24-6	Indeeco	QUZ	120/1/60	4.0
24-7	Indeeco	QUZ	120/1/60	4.0
24-8	Indeeco	QUZ	460/3/60	5.0
24-9	Indeeco	QUZ	120/1/60	4.0
24-10	Indeeco	QUZ	460/3/60	8.0
20-1	Indeeco	QUZ	120/1/60	4.0
20-2	Indeeco	QUZ	120/1/60	1.5
20-3	Indeeco	QUZ	460/3/60	6
20-4	Indeeco	QUZ	460/3/60	6
20-5	Indeeco	QUZ	460/3/60	6
15-1	Indeeco	QUZ	120/1/60	2.0
3-1	Indeeco	QUZ	120/1/60	3.0
13-1	Indeeco	QUZ	120/1/60	4.0
25-1	Indeeco	QUZ	120/1/60	1.0
25-2	Indeeco	QUZ	120/1/60	1.5
25-3	Indeeco	QUZ	460/3/60	5.0
25-4	Indeeco	QUZ	120/1/60	4.0
25-5	Indeeco	QUZ	120/1/60	4.0
25-6	Indeeco	QUZ	120/1/60	3.0

## APPENDIX C

## **ECM Calculations**

### ECM Summary Sheet

### ECM-1 Lighting Replacement/Upgrades

	2 2									
Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$	\$	\$	Years	Years
284,600	196,560	57	0	28,200	0	28,200	0.5	62,020	10.1	7.9

### ECM-2 Lighting Controls (Occupancy Sensors)

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
83,300	133,557	0.0	0	18,000	0	18,000	2.2	9,000	4.6	4.1

### ECM-3 Lighting Replacement with Controls (Occupancy Sensors)

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
367,900	307,404	56.8	0	41,700	0	41,700	0.7	71,020	8.8	7.1

### ECM-4 HVAC Condensing Boiler Addition

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
120,300	0	0.0	6,717	7,300	0	7,300	0.5	3,000	16.5	16.1

## ECM-5 HVAC Hot Water System Control Temperature Reset

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
11,000	0	0.0	2,220	2,400	0	2,400	2.3	0	4.6	4.6

### ECM-6 HVAC Chilled Water System Glycol Replacement

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Savings				incentive)	incentive)		
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
83,600	161,071	0.0	0	21,700	0	21,700	1.6	0	3.9	3.9

### ECM-7 Replace HVAC Electric Duct Heating Coils

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
131,300	794,976	0.0	-33,916	70,700	0	70,700	7.1	0	1.9	1.9

### ECM-8 Install Variable Frequency Drives, High Efficiency Motors

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
100,400	135,110	0.0	0	18,200	0	18,200	2.6	16,568	5.5	4.6

### ECM-9 HVAC Building Automation System Upgrade/Re-commissioning

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$		\$	Years	Years	
246,200	81,983	81,983 0.0 10,257 22,100				22,100	0.3	0	11.1	11.1

## ECM-10 Add HVAC Demand Control Ventilation

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
35,500	14,566	0.0	12	2,000	0	2,000	(0.2)	0	17.8	17.8

### ECM-11 Add CoolTrol Walk-in Controls

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
37,500	64,325	0.0	0	8,700	3.2	50	4.3	4.3		

### ECM-12 Add Variable Speed Kitchen Hood Controls

Budgetary		Annual Utili	ty Savings		Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	*Incentive	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$		\$	Years	Years	
42,800	3,747	0.0	369	900	0	900	(0.6)	0	N/A	N/A

West Essex Regional School District CHA Project #23985 65 West Greenbrook Road North Caldwell, NJ 07006 Engineer: NS

Utility	Costs	Yearly Usage	MTCDE
\$ 0.135	\$/kWh blended		0.00042021
\$ 0.122	\$/kWh consumpti	3,153,206	0.00042021
\$ 6.17	\$/Kw demand	634.2	0
\$ 1.08	\$/Therm	125,083	0.00533471
\$ -	\$/kgals	-	0

# West Essex High School

	Item			Sa	vings			C	Cost	Simple		Life
		kW	kWh	therms	cooling kWh	kgal/yr	\$	1		Payback	MTCDE	Expectancy
ECM-1	Lighting Replacement/Upgrades	57	196,560	0	0	0	\$ 28,200	\$	284,600	10.1	82.6	15
ECM-2	Lighting Controls (Occupancy Sensors)	0	133,557	0	0	0	\$ 18,000	\$	83,300	4.6	56.1	15
ECM-3	Lighting Replacement with Controls (Occupancy Sensors)	57	307,404	0	0	0	\$ 41,700	\$	367,900	8.8	129.2	15
ECM-4	HVAC Condensing Boiler Addition	0	0	6,717	0	0	\$ 7,300	\$	120,300	16.5	35.8	25
ECM-5	HVAC Hot Water System Control Temperature Reset	0	0	2,220	0	0	\$ 2,400	\$	11,000	4.6	11.8	15
ECM-6	HVAC Chilled Water System Glycol Replacement	0	161,071	0	0	0	\$ 21,700	\$	83,600	3.9	67.7	10
ECM-7	Replace HVAC Electric Duct Heating Coils	0	794,976	-33,916	0	0	\$ 70,700	\$	131,300	1.9	153.1	15
ECM-8	Install Variable Frequency Drives, High Efficiency Motors	0	135,110	0	0	0	\$ 18,200	\$	100,400	5.5	56.8	20
ECM-9	HVAC Building Automation System Upgrade/Re-commissioning	0	81,983	10,257	0	0	\$ 22,100	\$	246,200	11.1	89.2	15
ECM-10	Add HVAC Demand Control Ventilation	0	14,566	12	0	0	\$ 2,000	\$	35,500	17.8	6.2	15
ECM-11	Add CoolTrol Walk-in Controls	0	64,325	0	0	0	\$ 8,700	\$	37,500	4.3	27.0	18
ECM-12	Add Variable Speed Kitchen Hood Controls	0	3,747	369	0	0	\$ 900	\$	42,800	47.6	3.5	18

## Existing Facilities Program Replacement Form:

Performance Based

Applicant Name:	West Essex Regional School District
Facility Name:	High School Building
Date:	3/26/2012

						PRE-INSTALL	ATION		POST-IN	STALLATION				]			
Lingtom	Building	Floor	Area Description	Pre Fixt.	Bro Eixt Codo	Pre Watts /	Pre kW /	Existing Control	Post Fixt	Post Fixt	Post Watts/	Post kW /	Proposed Control	kW	Baseline Annual	Proposed Annual	Annual kWh
Integer line	Building Address	Floor fixture	Area Description Description of location that matches site	# of	Code from	Vatts/Fixt from		Pre-installation control	Number of	Code from	<b>FIXL</b> Watts/Fixt from	(Post	Post-installation control device	Pre	Existing	Proposed	(PreFixt
number		is on	map	existing	Wattage Table	Wattage Table	Watts/Fixt) *	device	fixtures	Wattage Table	Wattage Table	Watts/Fixt) *		kW/Space ·	annual	annual hours	#*PreWatts/Fixt *
				fixtures		_	(Pre Fixt		after retrofit		-	(Post Fixt		Post	hours for the	for the usage	(PostFixt#*PostW
							No.)					No.)		kW/Space	usage group	group	atts/Fixt * Proposed Hours)
	195 7th Ave. Swite 1000	10	Man'a Doom			110	0.24	Light Quitch	2	E4011 I		0.10	Mation Concer	0.16	2 000	2 000	477
<i>EX.</i>	485 7111 AVE, Suite 1008	10	Men's Room	3	F44ILL	112	0.34		3	F42ILL		0.10		0.10	3,000	3,000	4//
1	65 West Greenbrook Road, North Caldwell, NJ 07006	1	100	26	F42LL	60	) 1.56	Wall Switch	26	F42SSILL	48	3 1.25	Wall Switch	0.31	3,200	3,200	998
2	65 West Greenbrook Road, North Caldwell, NJ 07006	1	100	2	F41LL	32	2 0.06	Wall Switch	2	F41SSILL	26	6 0.05	Wall Switch	0.01	3,200	3,200	38
3	65 West Greenbrook Road, North Caldwell, NJ 07006	1	102	27	F42LL	60	) 1.62	Wall Switch	27	F42SSILL	48	3 1.30	Wall Switch	0.32	3,200	3,200	1,037
4	65 West Greenbrook Road, North Caldwell, NJ 07006	1	102A 102B	1	F41LL F43LL	32	2 0.03	Wall Switch	1	F41SSILL F43SSILL	26	0.03	Wall Switch	0.01	3,200	3,200	19 67
6	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101	65	F42LL	60	3.90	Wall Switch	65	F42SSILL	48	3.12	Wall Switch	0.78	3,200	3,200	2,496
7	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101A	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	3 0.05	Wall Switch	0.01	3,200	3,200	38
8	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101A	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Wall Switch	0.00	3,200	3,200	0
9	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101A 101B	1	I100/1	100	0.10	Wall Switch	1		29	0.03	Wall Switch	0.07	3,200	3,200	227
10	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101B	8	F42LL F42LL	60	0.24	Wall Switch	4	F42SSILL F42SSILL	40	0.19	Wall Switch	0.03	3,200	3,200	307
12	65 West Greenbrook Road, North Caldwell, NJ 07006	1	104	21	F42LL	60	1.26	Wall Switch	21	F42SSILL	48	3 1.01	Wall Switch	0.25	3,200	3,200	806
13	65 West Greenbrook Road, North Caldwell, NJ 07006	1	103	45	F42LL	60	2.70	Wall Switch	45	F42SSILL	48	3 2.16	Wall Switch	0.54	3,200	3,200	1,728
14	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101 LOFT	21	F41LL	32	2 0.67	Wall Switch	21	F41SSILL	26	0.55	Wall Switch	0.13	3,200	3,200	403
15	65 West Greenbrook Road, North Caldwell, NJ 07006	1	106A 105	24	F42LL F42LL	60	0.06	Wall Switch	1	F42SSILL	48	3 0.05 2 1.15	Wall Switch	0.01	3,200	3,200	38
10	65 West Greenbrook Road, North Caldwell, NJ 07006	1	105 105A	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	0.29	Wall Switch	0.23	3,200	3,200	230
18	65 West Greenbrook Road, North Caldwell, NJ 07006	1	106	18	F41LL	32	2 0.58	Wall Switch	18	F41SSILL	26	6 0.47	Wall Switch	0.11	3,200	3,200	346
19	65 West Greenbrook Road, North Caldwell, NJ 07006	1	106B	6	F41LL	32	2 0.19	Wall Switch	6	F41SSILL	26	6 0.16	Wall Switch	0.04	3,200	3,200	115
20	65 West Greenbrook Road, North Caldwell, NJ 07006	1	108	4	F41LL	32	2 0.13	Wall Switch	4	F41SSILL	26	<u> </u>	Wall Switch	0.02	3,200	3,200	77
21	65 West Greenbrook Road, North Caldwell, NJ 07006	1	110	18	F41LL F42L1	32	0.58	Wall Switch	18	F41SSILL F42SSILL	26 48	0.47	Wall Switch	0.11	3,200	3,200	346 730
23	65 West Greenbrook Road, North Caldwell, NJ 07006	1	107A	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.01	Wall Switch	0.20	3,200	3,200	38
24	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Wall Switch	0.04	3,200	3,200	115
25	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111A	3	F43LL	93	3 0.28	Wall Switch	3	F43SSILL	72	0.22	Wall Switch	0.06	3,200	3,200	202
26	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111B	6	F43LL	93	3 0.56	Wall Switch	6	F43SSILL	72		Wall Switch	0.13	3,200	3,200	403
27	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123A	8	F42LL F42LL	60	0.48	Occ Sensor	8	F42SSILL F42SSILL	48	0.80	Occ Sensor	0.22	3,200	3,200	307
29	65 West Greenbrook Road, North Caldwell, NJ 07006	1	113 MENS TR	2	F43LL	93	3 0.19	Wall Switch	2	F43SSILL	72	2 0.14	Wall Switch	0.04	3,200	3,200	134
30	65 West Greenbrook Road, North Caldwell, NJ 07006	1	115 CUSTODIAN	1	l100/1	100	0.10	Wall Switch	1	CF23/1	29	0.03	Wall Switch	0.07	3,200	3,200	227
31	65 West Greenbrook Road, North Caldwell, NJ 07006	1	117 WOMEN TR	2	F43LL	93	0.19	Wall Switch	2	F43SSILL	72	2 0.14	Wall Switch	0.04	3,200	3,200	134
32	65 West Greenbrook Road, North Caldwell, NJ 07006	1		10	CES20/1	32	0.32	Wall Switch	10	CFS20/1	20	0.20	Wall Switch	0.06	3,200	3,200	192
34	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	49	H250/1	250	) 12.25	Wall Switch	49	Custom Fixture 6	25	5 1.23	Wall Switch	11.03	3,200	3,200	35,280
35	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	15	MH200/1	232	3.48	Wall Switch	15	Custom Fixture 5	165	5 2.48	Wall Switch	1.01	3,200	3,200	3,216
36	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Wall Switch	0.02	3,200	3,200	77
37	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401	8	CFS20/1 CFT40/3-BX	20	0.16	Wall Switch	8	CFS20/1	20	0.16	Wall Switch	0.00	3,200	3,200	0
39	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401C	6	CFT40/3-BX	102	2 0.61	Wall Switch	6	CFT40/3-BX	102	2 0.61	Wall Switch	0.00	3,200	3,200	0
40	65 West Greenbrook Road, North Caldwell, NJ 07006	1	403	4	CFT40/3-BX	102	2 0.41	Wall Switch	4	CFT40/3-BX	102	2 0.41	Wall Switch	0.00	3,200	3,200	0
41	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401D	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	3 0.05	Wall Switch	0.01	3,200	3,200	38
42	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401B	4	CFT40/3-BX	102	2 0.41	Wall Switch	4	CFT40/3-BX	102	2 0.41	Wall Switch	0.00	3,200	3,200	0
43	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401A 401F	4	F42L1	102	0.41	Wall Switch	4	F42SSILL	48	0.41	Wall Switch	0.00	3,200	3,200	115
45	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402A	6	CFT40/3-BX	102	2 0.61	Wall Switch	6	CFT40/3-BX	102	2 0.61	Wall Switch	0.00	3,200	3,200	0
46	65 West Greenbrook Road, North Caldwell, NJ 07006	1	400	1	F43LL	93	3 0.09	Wall Switch	1	F43SSILL	72	2 0.07	Wall Switch	0.02	3,200	3,200	67
47	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402	12	CFT40/3-BX	102	2 1.22	Wall Switch	12	CFT40/3-BX	102	2 1.22	Wall Switch	0.00	3,200	3,200	0
48	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402B	4	CFT40/3-BX	102	0.41	Wall Switch	4	CF140/3-BX	102	0.41	Wall Switch	0.00	3,200	3,200	0
50	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402D	4	CFT40/3-BX	102	2 0.41	Wall Switch	4	CFT40/3-BX	102	2 0.41	Wall Switch	0.00	3,200	3,200	0
51	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402E	3	CFT40/3-BX	102	2 0.31	Wall Switch	3	CFT40/3-BX	102	2 0.31	Wall Switch	0.00	3,200	3,200	0
52	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402F	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Wall Switch	0.00	3,200	3,200	0
53	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402G	6	CFT40/3-BX	102	2 0.61	Wall Switch	6	CFT40/3-BX	102	0.61	Wall Switch	0.00	3,200	3,200	0
54 55	65 West Greenbrook Road, North Caldwell, NJ 07006	1	<u>402</u> 405	4 12	F4211	102 60	0.41	Wall Switch	4	F42SSIL1	102 28	0.41 0.58	Wall Switch	0.00	3,200 <u>3</u> 200	3,200	0 
56	65 West Greenbrook Road, North Caldwell, NJ 07006	1	404	18	F41LL	32	2 0.58	Wall Switch	18	F41SSILL	26	0.47	Wall Switch	0.14	3,200	3,200	346
57	65 West Greenbrook Road, North Caldwell, NJ 07006	1	407	21	F41LL	32	2 0.67	Wall Switch	21	F41SSILL	26	0.55	Wall Switch	0.13	3,200	3,200	403
58 File: 01 23954	65 West Greenbrook Road, North Caldwell, NJ 07006	1	406 WOMENS TR	5	F43LL	93	0.47	Wall Switch	5	F43SSILL	72	0.36	Wall Switch	0.11	3,200	3,200	<u>336</u> 5/24/2012

Worksheet: ECM-1 Lighting Replacement

## **INSTRUCTIONS**

Use one line for each fixture type in a room or area.

						PRE-INSTALL	ATION		POST-IN	STALLATION							
Linekom	Duilding	Floor	Area Decerintian	Pre Fixt.	Dro Fivt Code	Pre Watts /	Pre kW /	Evicting Control	Post Fixt	Post Fixt	Post Watts/	Post kW /	Drepeed Centrel	kW	Baseline Annual	Proposed Annual	Annual kWh
Line item	Building Building Addrose	Floor fixture	Area Description	NO.	Code from	FIXI		Dra installation control	NO.	Code from	FIXI	(Doot	Proposed Control	Saveo	<b>HOUIS</b>	<b>HOUIS</b>	(PreFixt
number	Building Address	is on		# 01	Wattage Table	Walls/Fixt Irom	(Pie Watte/Fixt) *	device		Wattage Table	Walls/Fixt ITOM	(POSI Watte/Fixt) *	Post-installation control device	rie kW/Space	Existing	Proposed	#*PreWatts/Fixt *
number		15 011	Шар	fixtures	wallage Table	Wallaye Table	(Pre Fixt	uevice	after retrofit	wallage Table	wallaye Table	(Post Fixt)		Post	hours for the	for the usage	Baseline Hrs) -
				IIXIUI65			No )					(1 USt Tixt		kW/Space		aroup	(PostFixt#"PostVV atts/Fixt *
							110.)					110.)		KW/Opube	usuge group	group	Proposed Hours)
																	1
50										<b>E</b> 4000	40			0.04	0.000	0.000	
59	65 West Greenbrook Road, North Caldwell, NJ 07006	1	408 CUST	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	3 0.05	Wall Switch	0.01	3,200	3,200	38
60	65 West Greenbrook Road, North Caldwell, NJ 07006	1	501 MENS TR	5	F43LL	93	0.47	Wall Switch	5		12	2 0.36	Wall Switch	0.11	3,200	3,200	336
61	65 West Greenbrook Road, North Caldwell, NJ 07006	1	409	18	F41LL	32	0.58	Wall Switch	18		20	0.47	Wall Switch	0.11	3,200	3,200	346
63	65 West Greenbrook Road, North Caldwell, NJ 07006	1	310 312 WOMEN TP	9	F43LL E41LL	90	0.04	Wall Switch	9		12		Wall Switch	0.19	3,200	3,200	<u> </u>
64	65 West Greenbrook Road, North Caldwell, NJ 07006	1	312 WOMEN TR	3	CES20/1	32		Wall Switch	3	CES20/1	20		Wall Switch	0.02	3,200	3,200	<u> </u>
65	65 West Greenbrook Road, North Caldwell, NJ 07006	1	312 WOWEN TK	10	E/311	20		Wall Switch	10		72	0.02	Wall Switch	0.00	3,200	3,200	672
66	65 West Greenbrook Road, North Caldwell, NJ 07000	1	3134	2	F43LL	90	0.00	Wall Switch	2		72	0.72	Wall Switch	0.21	3,200	3,200	134
67	65 West Greenbrook Road, North Caldwell, NJ 07000	1	313B	2	F43LL	90	0.13	Wall Switch	2		72	0.14	Wall Switch	0.04	3,200	3,200	134
68	65 West Greenbrook Road, North Caldwell, NJ 07006	1	3130	6	F43LL	93	0.15	Wall Switch	6	F43SSILL	72	0.14	Wall Switch	0.04	3 200	3 200	403
69	65 West Greenbrook Road, North Caldwell, NJ, 07006	1	313F	2	F43U	93	0.19	Wall Switch	2		72	0.10	Wall Switch	0.10	3 200	3 200	134
70	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313F	4	F43LL	93	0.37	Wall Switch	4	F43SSILL	72	0.29	Wall Switch	0.08	3,200	3,200	269
71	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313G	9	F43LL	93	0.84	Wall Switch	9	F43SSILL	72	2 0.65	Wall Switch	0.19	3.200	3.200	605
72	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313H STORAGE	3	F41LL	32	2 0.10	Wall Switch	3	F41SSILL	26	0.08	Wall Switch	0.02	3,200	3,200	58
73	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313 I STORAGE	1	F43LL	93	3 0.09	Wall Switch	1	F43SSILL	72	2 0.07	Wall Switch	0.02	3,200	3,200	67
74	65 West Greenbrook Road, North Caldwell, NJ 07006	1	SALAMONE LAB	23	F43LL	93	3 2.14	Wall Switch	23	F43SSILL	72	2 1.66	Wall Switch	0.48	3,200	3,200	1,546
75	65 West Greenbrook Road, North Caldwell, NJ 07006	1	314 MEN TR	3	F43LL	93	3 0.28	Wall Switch	3	F43SSILL	72	2 0.22	Wall Switch	0.06	3,200	3,200	202
76	65 West Greenbrook Road, North Caldwell, NJ 07006	1	314 MEN TR	1	F43LL	93	3 0.09	Wall Switch	1	F43SSILL	72	2 0.07	Wall Switch	0.02	3,200	3,200	67
77	65 West Greenbrook Road, North Caldwell, NJ 07006	1	311	9	F44LL	118	3 1.06	Wall Switch	9	F43SSILL	72	2 0.65	Wall Switch	0.41	3,200	3,200	1,325
78	65 West Greenbrook Road, North Caldwell, NJ 07006	1	309	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	3 0.29	Wall Switch	0.07	3,200	3,200	230
79	65 West Greenbrook Road, North Caldwell, NJ 07006	1	307	9	F44LL	118	3 1.06	Wall Switch	9	F44SSILL	96	6 0.86	Wall Switch	0.20	3,200	3,200	634
80	65 West Greenbrook Road, North Caldwell, NJ 07006	1	305	9	F44LL	118	3 1.06	Wall Switch	9	F44SSILL	96	6 0.86	Wall Switch	0.20	3,200	3,200	634
81	65 West Greenbrook Road, North Caldwell, NJ 07006	1	306	9	F44LL	118	3 1.06	Wall Switch	9	F44SSILL	96	6 0.86	Wall Switch	0.20	3,200	3,200	634
82	65 West Greenbrook Road, North Caldwell, NJ 07006	1	304	9	F44LL	118	3 1.06	Wall Switch	9	F44SSILL	96	6 0.86	Wall Switch	0.20	3,200	3,200	634
83	65 West Greenbrook Road, North Caldwell, NJ 07006	1	303	12	F44LL	118	3 1.42	Wall Switch	12	F44SSILL	96	6 1.15	Wall Switch	0.26	3,200	3,200	845
84	65 West Greenbrook Road, North Caldwell, NJ 07006	1	302	12	F44LL	118	3 1.42	Wall Switch	12	F44SSILL	96	6 1.15	Wall Switch	0.26	3,200	3,200	845
85	65 West Greenbrook Road, North Caldwell, NJ 07006	1	301	9	F44LL	118	3 1.06	Wall Switch	9	F44SSILL	96	6 0.86	Wall Switch	0.20	3,200	3,200	634
86	65 West Greenbrook Road, North Caldwell, NJ 07006	1	300	9	F44LL	118	3 1.06	Wall Switch	9	F44SSILL	96	6 0.86	Wall Switch	0.20	3,200	3,200	634
87	65 West Greenbrook Road, North Caldwell, NJ 07006	1	213A	6	CFS20/1	20	0.12	Wall Switch	6	CFS20/1	20	0.12	Wall Switch	0.00	3,200	3,200	0
88	65 West Greenbrook Road, North Caldwell, NJ 07006	1	217	15	F42LL	60	0.90	Occ Sensor	15	F42SSILL	48	0.72	Occ Sensor	0.18	3,200	3,200	576
89	65 West Greenbrook Road, North Caldwell, NJ 07006	1	215	15	F42LL	60	0.90	Occ Sensor	15	F42SSILL	48	3 0.72	Occ Sensor	0.18	3,200	3,200	576
90	65 West Greenbrook Road, North Caldwell, NJ 07006	1	211	32	F42LL	60	1.92	Occ Sensor	32	F425SILL	48	3 1.54		0.38	3,200	3,200	1,229
91	65 West Greenbrook Road, North Caldwell, NJ 07006	1	208	24	F42LL	60	1.44	Occ Sensor	24	F42SSILL	48	3 1.15		0.29	3,200	3,200	922
92	65 West Greenbrook Road, North Caldwell, NJ 07006	1	206	8	F43LL	93	0.74	Occ Sensor	8		12	2 0.58	Occ Sensor	0.17	3,200	3,200	538
93	65 West Greenbrook Road, North Caldwell, NJ 07006	1	204 210 WOMEN TR	24	CES20/1	00	0.02	Wall Switch	24	CES20/1	40 20		Wall Switch	0.29	3,200	3,200	922
94	65 West Greenbrook Road, North Caldwell, NJ 07006	1		1	E/311	20	0.02	Wall Switch	3		72	0.02	Wall Switch	0.00	3,200	3,200	202
95	65 West Greenbrook Road, North Caldwell, NJ 07000	1		1	CES20/1	30	0.20	Wall Switch	1	CES20/1	20	0.22	Wall Switch	0.00	3,200	3,200	
97	65 West Greenbrook Road, North Caldwell, NJ 07006	1	214 MEN TR	3	F43U	03	0.02	Wall Switch	3	F43SSILL	72	0.02	Wall Switch	0.06	3 200	3 200	202
98	65 West Greenbrook Road, North Caldwell, NJ, 07006	1	207	24	F42L	60	) 1 44	Occ Sensor	24	F42SSILL	48	1 15	Occ Sensor	0.00	3 200	3 200	922
99	65 West Greenbrook Road, North Caldwell, NJ 07006	1	209	4	F43LL	93	0.37	Wall Switch	4	F43SSILL	72	0.29	Wall Switch	0.08	3.200	3.200	269
100	65 West Greenbrook Road. North Caldwell, NJ 07006	1	209A	4	F43LL	.93	0.37	Wall Switch	4	F43SSILL	72	2 0.29	Wall Switch	0.08	3.200	3.200	269
101	65 West Greenbrook Road, North Caldwell, NJ 07006	1	205	24	F42LL	60	1.44	Occ Sensor	24	F42SSILL	48	1.15	Occ Sensor	0.29	3.200	3.200	922
102	65 West Greenbrook Road, North Caldwell, NJ 07006	1	203A	4	F43LL	93	3 0.37	Wall Switch	4	F43SSILL	72	2 0.29	Wall Switch	0.08	3,200	3,200	269
103	65 West Greenbrook Road, North Caldwell, NJ 07006	1	203	4	F43LL	93	3 0.37	Wall Switch	4	F43SSILL	72	2 0.29	Wall Switch	0.08	3,200	3,200	269
104	65 West Greenbrook Road, North Caldwell, NJ 07006	1	201	24	F42LL	60	) 1.44	Occ Sensor	24	F42SSILL	48	3 1.15	Occ Sensor	0.29	3,200	3,200	922
105	65 West Greenbrook Road, North Caldwell, NJ 07006	1	202	8	F42LL	60	0.48	Occ Sensor	8	F42SSILL	48	0.38	Occ Sensor	0.10	3,200	3,200	307
106	65 West Greenbrook Road, North Caldwell, NJ 07006	1	200	9	F42LL	60	0.54	Occ Sensor	9	F42SSILL	48	0.43	Occ Sensor	0.11	3,200	3,200	346
107	65 West Greenbrook Road, North Caldwell, NJ 07006	1	VESTIBULE	2	F42LL	60	0.12	Occ Sensor	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	3,200	77
108	65 West Greenbrook Road, North Caldwell, NJ 07006	1	503	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47	Wall Switch	0.11	3,200	3,200	346
109	65 West Greenbrook Road, North Caldwell, NJ 07006	1	505	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Wall Switch	0.04	3,200	3,200	115
110	65 West Greenbrook Road, North Caldwell, NJ 07006	1	507	10	F42LL	60	0.60	Wall Switch	10	F42SSILL	48	3 0.48	Wall Switch	0.12	3,200	3,200	384
111	65 West Greenbrook Road, North Caldwell, NJ 07006	1	509	24	F42LL	60	) 1.44	Wall Switch	24	F42SSILL	48	3 1.15	Wall Switch	0.29	3,200	3,200	922
112	65 West Greenbrook Road, North Caldwell, NJ 07006	2	502	4	F44LL	118	3 0.47	Wall Switch	4	F44SSILL	96	0.38	Wall Switch	0.09	3,200	3,200	282
113	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	68	F42LL	60	4.08	Wall Switch	68	F42SSILL	48	3 3.26	Wall Switch	0.82	3,200	3,200	2,611
114	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	30	CFS20/1	20	0.60	Wall Switch	30	CFS20/1	20	0.60	Wall Switch	0.00	3,200	3,200	0
115	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	8	F43LL	93	0.74	Wall Switch	8	F43SSILL	72	0.58	Wall Switch	0.17	3,200	3,200	538
116	b5 vvest Greenbrook Road, North Caldwell, NJ 07006	2	510B	2	F43LL	93	0.19	Wall Switch	2	F43SSILL	72	2 0.14	vvall Switch	0.04	3,200	3,200	134
117	b5 vvest Greenbrook Road, North Caldwell, NJ 07006	2	510A	8	F43LL	93	0.74	vvall Switch	8	F43SSILL	72	<u>(</u> 0.58	vvall Switch	0.17	3,200	3,200	538
118	b5 vvest Greenbrook Road, North Caldwell, NJ 07006	2	510C	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	0.22	VVall Switch	0.06	3,200	3,200	202
119	bo vvest Greenbrook Road, North Caldwell, NJ 07006	2	512A	4	F43LL	93	o 0.37	Wall Switch	4	F43SSILL	72	<u>(</u> 0.29		0.08	3,200	3,200	269
120	65 West Greenbrock Road, North Caldwell, NJ 07006	2	DIZ 511	12		60		Wall Switch	12		48		Wall Switch	0.14	3,200	3,200	461
121	65 West Greenbrook Road, North Caldwell, NJ 07006	2	517	24		32		Wall Switch	24		26	0.62	Wall Switch	0.14	3,200	3,200	401
122	65 West Greenbrook Road, North Caldwell, NJ 07006	2	510D	30		118	4.20	Wall Switch	30		90	3.40	Wall Switch	0.79	3,200	3,200	2,034
123	65 West Greenbrook Road, North Caldwell, NJ 07006	2	5100	10		110	0.94	Wall Switch	10		90	0.77	Wall Switch	0.10	3,200	3,200	003 Q/F
124	65 West Greenbrook Road, North Caldwell, NJ 07006	2	513A	0	F42L	71	) 0.54	Wall Switch	0	F42SSILL	3C	ין אין אין אין אין אין אין אין אין אין א	Wall Switch	0.20	3 200	3 200	346
125	65 West Greenbrook Road, North Caldwell, NJ, 07006	2	515	12	F44H	119	3 1 42	Wall Switch	12	F44SSILL		<u> </u>	Wall Switch	0.11	3 200	3 200	845
File: 01 23954	- West Essex RSD HS ECMs (Rev 1)	L		1 12					1 12			1 1.10		0.20	5,200	5,200	-5/24/2012

5/24/2012 7:37 AM

						PRE-INSTALLA	TION		POST-IN	STALLATION							
		-		Pre Fixt.		Pre Watts /	Pre kW /		Post Fixt	Post Fixt	Post Watts/	Post kW /		kW	Baseline Annual	Proposed Annual	Annual kWh
Line Item	Building	Floor	Area Description	<u>No.</u>	Pre Fixt Code	Fixt	Space	Existing Control	No.	Code	Fixt	Space	Proposed Control	Saved	Hours	Hours	Saved
Integer line	Building Address	Floor fixture	Description of location that matches site	# Of	Code from	Watts/Fixt from	(Pre	Pre-installation control	Number of	Code from	Watts/Fixt from	(Post	Post-installation control device	Pre k///Space	Existing	Proposed	#*PreWatts/Fixt *
number		IS ON	пар	fixtures	wallage rable	wallage rable	(Pro Fixt)	device	after retrofit	vvallage rable	wallage rable	(Post Fixt)		RVV/Space -	annuai	for the usage	Baseline Hrs) -
				IIXIUIES										kW/Space		aroup	,PostFixt#*PostW atts/Fixt *
												110.)		KW/Opace	usage group	group	Proposed Hours)
407		<u> </u>	044 75		05000/4		0.00			05000/4				0.00	0.000	0.000	
127	65 West Greenbrook Road, North Caldwell, NJ 07006	2	614 IR	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Vall Switch	0.00	3,200	3,200	0
128	65 West Greenbrook Road, North Caldwell, NJ 07006	2		3	F42LL	60	0.18	Wall Switch	3		48	0.14	Wall Switch	0.04	3,200	3,200	115
129	65 West Greenbrook Road, North Caldwell, NJ 07006	2	610 COSTODIAL	2 1	CES20/1	00	0.12	Wall Switch	<u> </u>	CES20/1	40 20		Wall Switch	0.02	3,200	3,200	
130	65 West Greenbrook Road, North Caldwell, NJ 07006	2	612 TR	1	E42U	20	0.02	Wall Switch	3		20	0.02	Wall Switch	0.00	3,200	3,200	115
131	65 West Greenbrook Road, North Caldwell, NJ 07006	2	608 TR	1	CES20/1	20	0.10	Wall Switch	1	CES20/1		0.14	Wall Switch	0.04	3,200	3 200	0
133	65 West Greenbrook Road, North Caldwell, NJ, 07006	2	608 TR	3	F42LL	60	0.18	Wall Switch	3	F42SSILI	48	0.14	Wall Switch	0.04	3,200	3,200	115
134	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606	15	F44LL	118	1.77	Wall Switch	15	F44SSILL	96	5 1.44	Wall Switch	0.33	3.200	3.200	1.056
135	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606	31	CFS20/1	20	0.62	Wall Switch	31	CFS20/1	20	0.62	Wall Switch	0.00	3,200	3,200	0
136	65 West Greenbrook Road, North Caldwell, NJ 07006	2	600	15	F44LL	118	1.77	Wall Switch	15	F44SSILL	96	5 1.44	Wall Switch	0.33	3,200	3,200	1,056
137	65 West Greenbrook Road, North Caldwell, NJ 07006	2	600	31	CFS20/1	20	0.62	Wall Switch	31	CFS20/1	20	0.62	2 Wall Switch	0.00	3,200	3,200	0
138	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606B	5	F41LL	32	0.16	Wall Switch	5	F41SSILL	26	0.13	Wall Switch	0.03	3,200	3,200	96
139	65 West Greenbrook Road, North Caldwell, NJ 07006	2	618	7	CFT40/3-BX	102	0.71	Wall Switch	7	CFT40/3-BX	102	0.71	Wall Switch	0.00	3,200	3,200	0
140	65 West Greenbrook Road, North Caldwell, NJ 07006	2	602	6	CFT40/3-BX	102	0.61	Wall Switch	6	CFT40/3-BX	102	2 0.61	Wall Switch	0.00	3,200	3,200	0
141	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604	8	CFT40/3-BX	102	0.82	Wall Switch	8	CFT40/3-BX	102	2 0.82	Wall Switch	0.00	3,200	3,200	0
142	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604	9	CFT40/3-BX	102	0.92	Wall Switch	9	CFT40/3-BX	102	2 0.92	Wall Switch	0.00	3,200	3,200	0
143	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604A	15	CFT40/3-BX	102	1.53	Wall Switch	15	6 CFT40/3-BX	102	2 1.53	Wall Switch	0.00	3,200	3,200	0
144	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604A	8	1100/1	100	0.80	Wall Switch	8	CF23/1	29	0.23	Wall Switch	0.57	3,200	3,200	1,818
145	65 West Greenbrook Road, North Caldwell, NJ 07006	2	6041	2	1100/1	100	0.20	Wall Switch	2	CF23/1	29	0.06	Wall Switch	0.14	3,200	3,200	454
146	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604K	2	F42LL	60	0.12	Wall Switch	2	P F42SSILL	48	0.10	Wall Switch	0.02	3,200	3,200	77
147	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604F	1	I100/1	100	0.10	Wall Switch	1	CF23/1	29	0.03		0.07	3,200	3,200	227
148	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604D	1	F42LL	60 100	0.06	Wall Switch	1	F4255ILL	48		Wall Switch	0.01	3,200	3,200	38
149	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604D	2	F41LL	100	0.20	Wall Switch	2		28		Wall Switch	0.14	3,200	3,200	404
150	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604B	1	F41LL F23LL	52	0.22	Wall Switch	1	F4133ILL	47	0.10	Wall Switch	0.04	3,200	3,200	134
152	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604G	2	F42L	52 60	0.03	Wall Switch	2	F42SSILL	47	0.03	Wall Switch	0.01	3,200	3,200	77
153	65 West Greenbrook Road, North Caldwell, NJ 07006	1	604H	1	F43LL	93	0.09	Wall Switch	1	F43SSILL	72	0.07	Wall Switch	0.02	3,200	3,200	67
154	65 West Greenbrook Road, North Caldwell, NJ 07006	1	604L	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	2 0.41	Wall Switch	0.00	3,200	3,200	0
155	65 West Greenbrook Road, North Caldwell, NJ 07006	1	604L	4	CFS20/1	20	0.08	Wall Switch	4	CFS20/1	20	0.08	Wall Switch	0.00	3,200	3,200	0
156	65 West Greenbrook Road, North Caldwell, NJ 07006	1	606A	12	F43LL	93	1.12	Wall Switch	12	F43SSILL	72	2 0.86	Wall Switch	0.25	3,200	3,200	806
157	65 West Greenbrook Road, North Caldwell, NJ 07006	1	620A	8	CFT40/3-BX	102	0.82	Wall Switch	8	GET40/3-BX	102	2 0.82	Wall Switch	0.00	3,200	3,200	0
158	65 West Greenbrook Road, North Caldwell, NJ 07006	1	620	12	CFT40/3-BX	102	1.22	Wall Switch	12	2 CFT40/3-BX	102	2 1.22	Wall Switch	0.00	3,200	3,200	0
159	65 West Greenbrook Road, North Caldwell, NJ 07006	1	616	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Wall Switch	0.02	3,200	3,200	77
160	65 West Greenbrook Road, North Caldwell, NJ 07006	1	701	9	F41LL	32	0.29	Wall Switch	9	F41SSILL	26	6 0.23	Wall Switch	0.05	3,200	3,200	173
161	65 West Greenbrook Road, North Caldwell, NJ 07006	1	700A	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Wall Switch	0.02	3,200	3,200	77
162	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702	7	F42LL	60	0.42	Wall Switch	7	F42SSILL	48	8 0.34	Wall Switch	0.08	3,200	3,200	269
163	65 West Greenbrook Road, North Caldwell, NJ 07006	1	704A	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Wall Switch	0.02	3,200	3,200	
164	65 West Greenbrook Road, North Caldwell, NJ 07006	1	/04B	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	0.29	Wall Switch	0.07	3,200	3,200	230
100	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702A 702B	3	F42LL F42LL	60	0.18	Wall Switch	3		48	0.14		0.04	3,200	3,200	115
100	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702B	2	F42LL	60	0.10	Wall Switch	3	F42SSILL	40	0.14	Wall Switch	0.04	3,200	3,200	77
168	65 West Greenbrook Road, North Caldwell, NJ 07006	1	700 ELECT	<u> </u>	F42LL	60	0.12	Wall Switch	1	F42SSILL	40	0.10	Wall Switch	0.02	3,200	3 200	
169	65 West Greenbrook Road, North Caldwell, NJ, 07006	1	622	14	F42LL	60	0.00	Wall Switch	14	F42SSILL	48	0.03	Wall Switch	0.01	3 200	3 200	538
170	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622G	4	F42LL	60	0.24	Wall Switch	4	F42SSILL	48	0.19	Wall Switch	0.05	3.200	3.200	154
171	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622D STORAGE	5	F42LL	60	0.30	Wall Switch	5	F42SSILL	48	0.24	Wall Switch	0.06	3,200	3,200	192
172	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622F	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	.14	Wall Switch	0.04	3,200	3,200	115
173	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622J	10	F42LL	60	0.60	Wall Switch	10	F42SSILL	48	0.48	Wall Switch	0.12	3,200	3,200	384
174	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622C	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Wall Switch	0.01	3,200	3,200	38
175	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622B	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Wall Switch	0.04	3,200	3,200	115
176	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622A	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Wall Switch	0.04	3,200	3,200	115
177	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622H	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	0.29	Wall Switch	0.07	3,200	3,200	230
178	65 West Greenbrook Road, North Caldwell, NJ 07006	1	624	4	F41LL	32	0.13	Wall Switch	4	F41SSILL	26	6 0.10	Wall Switch	0.02	3,200	3,200	
1/9	65 West Greenbrook Road, North Caldwell, NJ 07006	1	626	2	F41LL	32	0.06	Wall Switch	2	F41SSILL	26	0.05	Wall Switch	0.01	3,200	3,200	38
180	bo west Greenbrook Road, North Caldwell, NJ 07006		628	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26			0.11	3,200	3,200	346
181	65 West Greenbrock Road, North Caldwell, NJ 07006	1	63U	12	E43LL	93	1.12	Wall Switch	12	E4300ILL				0.25	3,200	3,200	806
102	65 West Greenbrook Road, North Caldwell, NJ 07006	1	630 630	1	F43LL F49L1	93	0.09	Wall Switch	1	F4333ILL	/2		Wall Switch	0.02	3,200 2 200	3,200 2,200	20
103	65 West Greenbrook Road, North Caldwell, NJ 07006	1	901	<u>।</u> २	F4311	00	0.00	Wall Switch	2	F43SSILL	40 70	> 0.00 > 0.00	Wall Switch	0.01	3,200	3,200	<u> </u>
185	65 West Greenbrook Road, North Caldwell, NJ 07006	1	901A	1	F4211	90 60	0.20	Wall Switch	1	F42SSILL	<u></u> Δβ	3 0.22	Wall Switch	0.00	3 200	3 200	
186	65 West Greenbrook Road. North Caldwell, NJ 07006	1	902A	15	F43LI	<u>0</u> 3	1.40	Wall Switch	15	F43SSILI	72	2 1 08	Wall Switch	0.32	3.200	3,200	1.008
187	65 West Greenbrook Road. North Caldwell, NJ 07006	1	634	1	F41LL	32	0.03	Wall Switch	1	F41SSILL	26	0.03	Wall Switch	0.01	3.200	3.200	19
188	65 West Greenbrook Road, North Caldwell, NJ 07006	1	632	2	F43LL	93	0.19	Wall Switch	2	F43SSILL	72	0.14	Wall Switch	0.04	3,200	3,200	134
189	65 West Greenbrook Road, North Caldwell, NJ 07006	1	636	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	2 0.22	Wall Switch	0.06	3,200	3,200	202
190	65 West Greenbrook Road, North Caldwell, NJ 07006	1	930	30	MH400/1	458	13.74	Wall Switch	30	Custom Fixture 4	200	6.00	Wall Switch	7.74	4,160	4,160	32,198
191	65 West Greenbrook Road, North Caldwell, NJ 07006	1	930	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	3 0.05	Wall Switch	0.01	3,200	3,200	38
192	65 West Greenbrook Road, North Caldwell, NJ 07006	1	921	7	F41LL	32	0.22	Wall Switch	7	F41SSILL	26	6 0.18	Wall Switch	0.04	3,200	3,200	134
193	65 West Greenbrook Road, North Caldwell, NJ 07006	1	931	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Wall Switch	0.02	3,200	3,200	77
194	65 West Greenbrook Road, North Caldwell, NJ 07006	1	900	30	MH400/1	458	13.74	Wall Switch	30	Custom Fixture 4	200	6.00	Wall Switch	7.74	4,160	4,160	32,198

Worksheet: ECM-1 Lighting Replacement

7:37 AM

				PRE-INSTALLATION POST-INSTA				STALLATION									
L ine Item	Building	Floor	Area Description	Pre Fixt.	Pre Fixt Code	Pre Watts /	Pre kW /	Existing Control	Post Fixt	Post Fixt	Post Watts/	Post kW /	Proposed Control	kW Saved	Baseline Annual Hours	Proposed Annual Hours	Annual kWh Saved
Integer line	Building Address	Floor fixture	Description of location that matches site	# of	Code from	Watts/Fixt from		Pre-installation control	Number of	Code from	Watts/Fixt from	(Post	Post-installation control device	Pro	Existing	Proposed	(PreFixt
number	Duliding Address	is on	map	existing	Wattage Table	Wattage Table	Watts/Fixt) *	device	fixtures	Wattage Table	Wattage Table	Watts/Fixt) *		kW/Space	annual	annual hours	#*PreWatts/Fixt *
			l	fixtures			(Pre Fixt		after retrofit	t	Tranage Table	(Post Fixt		Post	hours for the	for the usage	Baseline Hrs) - (PostFixt#*PostW
							No.)					No.)		kW/Space	usage group	group	atts/Fixt *
							,					,			5 5 1	5 1	Proposed Hours)
																	1
105	65 West Greenbreek Beed North Caldwell, N.L. 07006	1	014	2	E42U	60	0.12	Wall Switch	2		10	0.10	Wall Switch	0.02	2 200	2 200	77
195	65 West Greenbrook Road, North Caldwell, NJ, 07006	1	914 016F	12	F42LL F41LL	32	0.12	Wall Switch	12		40	0.10	Wall Switch	0.02	3,200	3,200	230
190	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916H	12	F41LL	52 60	0.30	Wall Switch	12		2C	0.31	Wall Switch	0.07	3,200	3,200	154
197	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916G	2	F42LL	60	0.12	Wall Switch	2	P F42SSILL	48	3 0.10	Wall Switch	0.02	3,200	3,200	77
199	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916	3	F42LL	60	0.12	Wall Switch	3	F42SSILL	48	0.14	Wall Switch	0.02	3,200	3.200	115
200	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916L	8	F42LL	60	0.48	Wall Switch	8	F42SSILL	48	0.38	Wall Switch	0.10	3,200	3,200	307
201	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916L	5	F41LL	32	0.16	Wall Switch	5	5 F41SSILL	26	0.13	Wall Switch	0.03	3,200	3,200	96
202	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916A	6	F41LL	32	0.19	Wall Switch	6	F41SSILL	26	6 0.16	Wall Switch	0.04	3,200	3,200	115
203	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916	32	F41LL	32	1.02	Wall Switch	32	F41SSILL	26	6 0.83	Wall Switch	0.19	3,200	3,200	614
204	65 West Greenbrook Road, North Caldwell, NJ 07006	1	907	2	F42LL	60	0.12	Wall Switch	2	2 F42SSILL	48	3 0.10	Wall Switch	0.02	3,200	3,200	77
205	65 West Greenbrook Road, North Caldwell, NJ 07006	1	907	18	CFS20/1	20	0.36	Wall Switch	18	B CFS20/1	20	0.36	Wall Switch	0.00	3,200	3,200	0
206	65 West Greenbrook Road, North Caldwell, NJ 07006	1	911	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	3 0.14	Wall Switch	0.04	3,200	3,200	115
207	65 West Greenbrook Road, North Caldwell, NJ 07006	1	913	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	3 0.14	Wall Switch	0.04	3,200	3,200	115
208	65 West Greenbrook Road, North Caldwell, NJ 07006	1	910	30	F42LL	60	1.80	Wall Switch	30	F42SSILL	48	3 1.44	Wall Switch	0.36	3,200	3,200	1,152
209	b5 vvest Greenbrook Road, North Caldwell, NJ 07006	1	916	6	F42LL	60	0.36		6	F42SSILL	48	sj 0.29		0.07	3,200	3,200	230
210	b5 west Greenbrook Road, North Caldwell, NJ 07006	1	904	30	F42LL	60	1.80	Wall Switch	30	F42SSILL	48	5 1.44 5 0.00		0.36	3,200	3,200	1,152
211	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904U	6		60	0.36	Wall Switch	6	CET40/2 DV	48			0.07	3,200	3,200	230
212	65 West Greenbrook Road, North Caldwell, NJ 07006	1				102	0.20	Wall Switch	2	CFT/0/2_PV	102		Wall Switch	0.00	3,200	3,200	0
213	65 West Greenbrook Road, North Caldwell, NJ, 07006	1	904D 922B	2	E42U	60	0.20	Wall Switch	2		102	2 0.20 8 0.14	Wall Switch	0.00	3,200	3,200	115
214	65 West Greenbrook Road, North Caldwell, NJ 07006	1	9220	1	F42LL	60	0.10	Wall Switch	1	F42SSILL	48	3 0.05	Wall Switch	0.04	3 200	3,200	38
216	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922A	4	F43L	93	0.37	Wall Switch	4	F43SSILL	72	0.29	Wall Switch	0.08	3,200	3,200	269
217	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922F	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	0.29	Wall Switch	0.07	3.200	3.200	230
218	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922F	8	F41LL	32	0.26	Wall Switch	8	F41SSILL	26	6 0.21	Wall Switch	0.05	3,200	3,200	154
219	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922	28	F41LL	32	0.90	Wall Switch	28	F41SSILL	26	6 0.73	Wall Switch	0.17	3,200	3,200	538
220	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922H	2	F42LL	60	0.12	Wall Switch	2	2 F42SSILL	48	3 0.10	Wall Switch	0.02	3,200	3,200	77
221	65 West Greenbrook Road, North Caldwell, NJ 07006	1	817	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	3 0.14	Wall Switch	0.04	3,200	3,200	115
222	65 West Greenbrook Road, North Caldwell, NJ 07006	1	819	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	3 0.14	Wall Switch	0.04	3,200	3,200	115
223	65 West Greenbrook Road, North Caldwell, NJ 07006	1	805	12	F42LL	60	0.72	Wall Switch	12	2 F42SSILL	48	3 0.58	Wall Switch	0.14	3,200	3,200	461
224	65 West Greenbrook Road, North Caldwell, NJ 07006	1	808	12	F42LL	60	0.72	Wall Switch	12	F42SSILL	48	0.58	Wall Switch	0.14	3,200	3,200	461
225	65 West Greenbrook Road, North Caldwell, NJ 07006	1	810	8	F42LL	60	0.48	Wall Switch	8	F42SSILL	48	3 0.38	Wall Switch	0.10	3,200	3,200	307
226	65 West Greenbrook Road, North Caldwell, NJ 07006	1	807	12	F42LL	60	0.72	Wall Switch	12	F42SSILL	48	0.58	Wall Switch	0.14	3,200	3,200	461
227	65 West Greenbrook Road, North Caldwell, NJ 07006	1	809	12	F42LL	60	0.72	Wall Switch	12		48	0.58	Wall Switch	0.14	3,200	3,200	461
220	65 West Greenbrook Road, North Caldwell, NJ 07006	1	011	12	F42LL F42LL	60	0.72	Wall Switch	12		40	0.50	Wall Switch	0.14	3,200	3,200	401
229	65 West Greenbrook Road, North Caldwell, NJ 07006	1	815	12	F42LL	60	0.72	Wall Switch	12	F42SSILL	40	0.30	Wall Switch	0.14	3,200	3,200	576
231	65 West Greenbrook Road, North Caldwell, NJ 07006	1	815A	4	F43LL	93	0.30	Wall Switch	4	F43SSILL	72	0.29	Wall Switch	0.08	3,200	3.200	269
232	65 West Greenbrook Road, North Caldwell, NJ 07006	1	803A	4	F43LL	93	0.37	Wall Switch	4	F43SSILL	72	2 0.29	Wall Switch	0.08	3.200	3.200	269
233	65 West Greenbrook Road, North Caldwell, NJ 07006	1	801A	4	F43LL	93	0.37	Wall Switch	4	F43SSILL	72	2 0.29	Wall Switch	0.08	3,200	3,200	269
234	65 West Greenbrook Road, North Caldwell, NJ 07006	1	801	3	CFS20/1	20	0.06	Wall Switch	3	B CFS20/1	20	0.06	Wall Switch	0.00	3,200	3,200	0
235	65 West Greenbrook Road, North Caldwell, NJ 07006	1	801	15	F42LL	60	0.90	Wall Switch	15	5 F42SSILL	48	3 0.72	Wall Switch	0.18	3,200	3,200	576
236	65 West Greenbrook Road, North Caldwell, NJ 07006	1	803	3	CFS20/1	20	0.06	Wall Switch	3	3 CFS20/1	20	0.06	Wall Switch	0.00	3,200	3,200	0
237	65 West Greenbrook Road, North Caldwell, NJ 07006	1	803	15	F42LL	60	0.90	Wall Switch	15	5 F42SSILL	48	3 0.72	Wall Switch	0.18	3,200	3,200	576
238	65 West Greenbrook Road, North Caldwell, NJ 07006	1	731	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	<u>6 0.47</u>	Wall Switch	0.11	3,200	3,200	346
239	b5 west Greenbrook Road, North Caldwell, NJ 07006	1	/30	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47		0.11	3,200	3,200	346
240	65 West Groopbrock Road, North Caldwell, NJ 07006	1	129	18		32	0.58	Wall Switch	18		26		Wall Switch	0.11	3,200	3,200	346
241	65 West Greenbrock Road, North Caldwell, NJ 07006	1	120 707	18	Γ41LL Ε/111	32	. 0.58	Wall Switch	18		20		Wall Switch	0.11	3,200	3,200 2 200	340
242	65 West Greenbrook Road, North Caldwell, NJ 07006	1	726	10	F4111	32	0.00 0.50	Wall Switch	10	F41SSILL	20	) 0.47 ) 0.47	Wall Switch	0.11	3,200	3 200	340
243	65 West Greenbrook Road, North Caldwell, NJ 07006	1	725	18	F4111	32	0.58	Occ Sensor	18	F41SSILL	20	6 0.47 6 0.47	Occ Sensor	0.11	3 200	3 200	346
245	65 West Greenbrook Road. North Caldwell, NJ 07006	1	722	4	F41LL	32	0.13	Occ Sensor	4	F41SSILL	26	6 0.10	Occ Sensor	0.02	3.200	3.200	77
246	65 West Greenbrook Road, North Caldwell, NJ 07006	1	718	1	F42LL	60	0.06	Occ Sensor	1	F42SSILL	48	3 0.05	Occ Sensor	0.01	3,200	3,200	38
247	65 West Greenbrook Road, North Caldwell, NJ 07006	1	720	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Wall Switch	0.00	3,200	3,200	0
248	65 West Greenbrook Road, North Caldwell, NJ 07006	1	720	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	2 0.22	Wall Switch	0.06	3,200	3,200	202
249	65 West Greenbrook Road, North Caldwell, NJ 07006	1	716	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Wall Switch	0.00	3,200	3,200	0
250	65 West Greenbrook Road, North Caldwell, NJ 07006	1	716	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	0.22	Wall Switch	0.06	3,200	3,200	202
251	65 West Greenbrook Road, North Caldwell, NJ 07006	1	721	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	6 0.47	Wall Switch	0.11	3,200	3,200	346
252	65 West Greenbrook Road, North Caldwell, NJ 07006	1	723	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47	Wall Switch	0.11	3,200	3,200	346
253	55 West Greenbrook Road, North Caldwell, NJ 07006	1	/19	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47		0.11	3,200	3,200	346
254	65 West Greenbrook Road, North Caldwell, NJ 07006	1	/1/	18		32	0.58	Wall Switch	18		26			0.11	3,200	3,200	346
200 256	65 West Greenbrook Road, North Caldwell, NJ 07006	1	713	10	F41LL F/111	32	. U.58 0 50	Wall Switch	18		20	0.4/	Wall Switch	0.11	3,200 3,200	3,∠UU 3,200	340
250	65 West Greenbrook Road, North Caldwell, NJ 07006	1	711	10	F4111	32	0.00 0.50	Wall Switch	10	F41SSILL	20	) 0.47 ) 0.47	Wall Switch	0.11	3,200	3,200	340
258	65 West Greenbrook Road. North Caldwell, NJ 07006	1	709	18	F41LL	32	0.58	Wall Switch	18	F41SSILI	20	6 0.47	Wall Switch	0.11	3.200	3.200	346
259	65 West Greenbrook Road. North Caldwell, NJ 07006	1	708	18	F41LL	32	2.0.58	Wall Switch	18	F41SSILL	26	6 0.47	Wall Switch	0.11	3.200	3.200	346
260	65 West Greenbrook Road, North Caldwell, NJ 07006	1	707	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47	Wall Switch	0.11	3,200	3,200	346
261	65 West Greenbrook Road, North Caldwell, NJ 07006	1	706	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	6 0.47	Wall Switch	0.11	3,200	3,200	346
262	65 West Greenbrook Road, North Caldwell, NJ 07006	1	705	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	6 0.47	Wall Switch	0.11	3,200	3,200	346

File: 01 23954 - West Essex RSD HS ECMs (Rev 1) Worksheet: ECM-1 Lighting Replacement 5/24/2012 7:37 AM

						PRE-INSTALL	ATION		POST-IN	STALLATION				1			
				Pre											Baseline	Proposed	Annual
				Fixt.		Pre Watts /	Pre kW /		Post Fixt	Post Fixt	Post Watts/	Post kW /	,	kW	Annual	Annual	kWh
l ine Item	Building	Floor	Area Description	No.	Pre Fixt Code	Fixt	Space	Existing Control	No.	Code	Fixt	Space	Proposed Control	Saved	Hours	Hours	Saved
Integer line	Building Address	Floor fixture	Description of location that matches site	# of	Code from	Watts/Fixt from	(Pre	Pre-installation control	Number of	Code from	Watts/Fixt from	(Post	Post-installation control device	Pre	Existing	Proposed	(PreFixt
number		is on	map	existing	Wattage Table	Wattage Table	Watts/Fixt)	* device	fixtures	Wattage Table	Wattage Table	Watts/Fixt) *	*	kW/Space	annual	annual hours	#*PreWatts/Fixt *
				fixtures	Ū		(Pre Fixt		after retrofit	t		(Post Fixt		Post	hours for the	for the usage	(PostFixt#*PostW
							No.)					No.)		kW/Space	usage group	group	atts/Fixt *
																	Proposed Hours)
263	65 West Greenbrook Road, North Caldwell, NJ 07006	1	701	9	F41LL	32	2 0.29	9 Wall Switch	9	F41SSILL	20	6 0.23	Wall Switch	0.05	3,200	3,200	173
264	65 West Greenbrook Road, North Caldwell, NJ 07006	1	700	1	F43LL	93	3 0.09	Wall Switch	1	F43SSILL	72	2 0.07	Wall Switch	0.02	3,200	3,200	67
265	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	109	FU2LL	60	0 6.54	4 Wall Switch	109	FU2ILL	59	9 6.43	Wall Switch	0.11	3,200	3,200	349
266	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	72	F42LL	60	0 4.32	2 Wall Switch	72	F42SSILL	48	3 3.46	Wall Switch	0.86	3,200	3,200	2,765
267	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	2	F43LL	93	3 0.19	Wall Switch	2	F43SSILL	72	2 0.14	Wall Switch	0.04	3,200	3,200	134
268	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	13	CFS20/1	20	0.26	8 Wall Switch	13	CFS20/1	20	0.26	Wall Switch	0.00	3,200	3,200	0
269	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	24	F44LL	118	8 2.83	3 Wall Switch	24	F44SSILL	96	6 2.30	Wall Switch	0.53	3,200	3,200	1,690
270	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	24	F44LL	118	8 2.83	3 Wall Switch	24	F44SSILL	96	6 2.30	Wall Switch	0.53	3,200	3,200	1,690
271	65 West Greenbrook Road, North Caldwell, NJ 07006	1	906	6	F42LL	60	0.36	8 Wall Switch	6	F42SSILL	48	3 0.29	Wall Switch	0.07	3,200	3,200	230
272	65 West Greenbrook Road, North Caldwell, NJ 07006	1	908	6	F42LL	60	0.36	6 Wall Switch	6	F42SSILL	48	3 0.29	Wall Switch	0.07	3,200	3,200	230
273	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904A	4	F42LL	60	0 0.24	Wall Switch	4	F42SSILL	48	3 0.19	Wall Switch	0.05	3,200	3,200	154
274	65 West Greenbrook Road, North Caldwell, NJ 07006	1	909	6	F42LL	60	0.36	8 Wall Switch	6	F42SSILL	48	3 0.29	Wall Switch	0.07	3,200	3,200	230
275	65 West Greenbrook Road, North Caldwell, NJ 07006	1	924	6	F42LL	60	0.36	8 Wall Switch	6	F42SSILL	48	3 0.29	Wall Switch	0.07	3,200	3,200	230
276	65 West Greenbrook Road, North Caldwell, NJ 07006	1	926	8	F42LL	60	0.48	3 Wall Switch	8	F42SSILL	48	3 0.38	Wall Switch	0.10	3,200	3,200	307
277	65 West Greenbrook Road, North Caldwell, NJ 07006	1	928	6	F42LL	60	0.36	8 Wall Switch	6	F42SSILL	48	3 0.29	Wall Switch	0.07	3,200	3,200	230
278	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1000	20	F42LL	60	0 1.20	) Wall Switch	20	F42SSILL	48	3 0.96	Wall Switch	0.24	3,200	3,200	768
279	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1000A	5	F42LL	60	0.30	Wall Switch	5	5 F42SSILL	48	3 0.24	Wall Switch	0.06	3,200	3,200	192
280	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1001, CLOSET & BATHROOM	20	F42LL	60	0 1.20	Wall Switch	20	F42SSILL	48	3 0.96	Wall Switch	0.24	3,200	3,200	768
281	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1002A	4	F42LL	60	0.24	Wall Switch	4	F42SSILL	48	3 0.19	Wall Switch	0.05	3,200	3,200	154
282	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1002	18	F42LL	60	0 1.08	3 Wall Switch	18	F42SSILL	48	3 0.86	Wall Switch	0.22	3,200	3,200	691
283	65 West Greenbrook Road, North Caldwell, NJ 07006	1	EXTERIOR	50	MH400/1	458	8 22.90	) Light Sensors	50	MH400/1	458	3 22.90	Light Sensors	0.00	4,368	4,368	0
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		ļ											T	1			<b></b>
																	1
						Total Pre kW	V 231.76	5 Total Post Fixt	. 2,896.00		Total Post kW	/  174.98	Total kW Saved	l  56.78	Total Annua	al kWh Saved	196,560.00

## Existing Facilities Program Controls Form:

Performance Based

Facility Name:

Date:

Applicant Name:

West Essex Regional School District High School Building

3/26/2012

						PRE-INSTALLA	TION		POST-INST	ALLATION				1			
				Pre											Baseline	Proposed	
				Fixt.			Pre kW /			Post Fixt	Post Watts/	Post kW /		kW	Annual	Annual	Annual kWh
Line Item	Building	Floor	Area Description	No.	Pre Fixt Code	Pre Watts / Fixt	Space	Existing Control	Post Fixt No.	Code	Fixt	Space	Proposed Control	Saved	Hours	Hours	Saved
Integer line	Building Address	Floor fixture	Description of location that matches site	# of	Code from Wattage	Watts/Fixt from	(Pre	Pre-installation control	Number of	Code from	Watts/Fixt from	(Post	Post-installation control device	Pre	Existing	Proposed	(PreFixt
number		is on	map	existing	Table	Wattage Table	Watts/Fixt) *	device	fixtures after	Wattage Table	Wattage Table	Watts/Fixt) *		kW/Space ·	annual hours	annual hours	#*PreWatts/Fixt * Baseline Hrs) -
				fixtures			(Pre Fixt		retrofit			(Post Fixt		Post	for the usage	for the usage	(PostFixt#*PostWatts/
							NO.)					NO.)		kw/Space	group	group	Hours)
Ex.	485 7th Ave. Suite 1006	10	Men's Room	3	F44ILL	112	0.34	Light Switch	3	F44ILL	112	0.34	Motion Sensor	0.00	3.000	2.000	336
								Ŭ									
1	65 West Greenbrook Road, North Caldwell, NJ 07006	1	100	26	F42LL	60	1.56	Wall Switch	26	F42LL	60	1.56	Occ Sensor	0.00	3,200	2,800	624
2	65 West Greenbrook Road, North Caldwell, NJ 07006	1	100	2	F41LL	32	0.06	Wall Switch	2	F41LL	32	0.06	Occ Sensor	0.00	3,200	2,800	26
3	65 West Greenbrook Road, North Caldwell, NJ 07006	1	102	27	F42LL E41U	60	1.62	Wall Switch	27	F42LL E41LL	60	1.62	Occ Sensor	0.00	3,200	2,800	648
5	65 West Greenbrook Road, North Caldwell, NJ 07000	1	102A	1	F43LL	93	0.03	Wall Switch	1	F43LL	93	0.03	Occ Sensor	0.00	3,200	2,800	37
6	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101	65	F42LL	60	3.90	Wall Switch	65	F42LL	60	3.90	Occ Sensor	0.00	3,200	2,800	1,560
7	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101A	1	F42LL	60	0.06	Wall Switch	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,800	24
8	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101A	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
9	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101A 101P	1	I100/1	100	0.10	Wall Switch	1	I100/1	100	0.10	Occ Sensor	0.00	3,200	2,800	
10	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101B	4	F42LL F42LI	00 60	0.24	Wall Switch	4	F42LL F42LI	60	0.24	Occ Sensor	0.00	3,200	2,800	192
12	65 West Greenbrook Road, North Caldwell, NJ 07006	1	104	21	F42LL	60	1.26	Wall Switch	21	F42LL	60	1.26	Occ Sensor	0.00	3,200	2,800	504
13	65 West Greenbrook Road, North Caldwell, NJ 07006	1	103	45	F42LL	60	2.70	Wall Switch	45	F42LL	60	2.70	Occ Sensor	0.00	3,200	2,800	1,080
14	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101 LOFT	21	F41LL	32	0.67	Wall Switch	21	F41LL	32	0.67	Occ Sensor	0.00	3,200	2,800	269
15	65 West Greenbrook Road, North Caldwell, NJ 07006	1	106A	1	F42LL	60	0.06	Wall Switch	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,800	24
16	65 West Greenbrook Road, North Caldwell, NJ 07006	1	105	24	F42LL E42LL	60	1.44	Wall Switch	24	F42LL	60	1.44	Occ Sensor	0.00	3,200	2,800	576
17	65 West Greenbrook Road, North Caldwell, NJ 07006	1	106	18	F42LL F41LL	32	0.50	Wall Switch	18	F42LL F41LL	32	0.30	Occ Sensor	0.00	3,200	2,800	230
19	65 West Greenbrook Road, North Caldwell, NJ 07006	1	106B	6	F41LL	32	0.19	Wall Switch	6	F41LL	32	0.19	Occ Sensor	0.00	3,200	2,800	77
20	65 West Greenbrook Road, North Caldwell, NJ 07006	1	108	4	F41LL	32	0.13	Wall Switch	4	F41LL	32	0.13	Occ Sensor	0.00	3,200	2,800	51
21	65 West Greenbrook Road, North Caldwell, NJ 07006	1	110	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	0.58	Occ Sensor	0.00	3,200	2,800	230
22	65 West Greenbrook Road, North Caldwell, NJ 07006	1	107	19	F42LL	60	1.14	Wall Switch	19	F42LL	60	1.14	Occ Sensor	0.00	3,200	2,800	456
23	65 West Greenbrook Road, North Caldwell, NJ 07006	1	107A	1	F42LL F42LL	60 60	0.06	Wall Switch	1	F42LL F42LL	60 60	0.06	Occ Sensor	0.00	3,200	2,800	24
24	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111A	3	F43LL	93	0.10	Wall Switch	3	F43LL	93	0.10	Occ Sensor	0.00	3,200	2,800	112
26	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111B	6	F43LL	93	0.56	Wall Switch	6	F43LL	93	0.56	Occ Sensor	0.00	3,200	2,800	223
27	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111C	18	F42LL	60	1.08	Wall Switch	18	F42LL	60	1.08	Occ Sensor	0.00	3,200	2,800	432
28	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123A	8	F42LL	60	0.48	Occ Sensor	8	F42LL	60	0.48	Occ Sensor	0.00	3,200	2,800	192
29	65 West Greenbrook Road, North Caldwell, NJ 07006	1	113 MENS IR	2	F43LL	93	0.19	Wall Switch	2	F43LL	93	0.19	Occ Sensor	0.00	3,200	2,800	
30	65 West Greenbrook Road, North Caldwell, NJ 07006	1	113 COSTODIAN 117 WOMEN TR	2	F43U	93	0.10	Wall Switch	2	F43U	100	0.10	Occ Sensor	0.00	3,200	2,800	40
32	65 West Greenbrook Road, North Caldwell, NJ 07006	1	121/119 ELECT	10	F41LL	32	0.13	Wall Switch	10	F41LL	32	0.13	Occ Sensor	0.00	3,200	2,800	128
33	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CUSTODIAL CLOSET	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
34	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	49	H250/1	250	12.25	Wall Switch	49	H250/1	250	12.25	Occ Sensor	0.00	3,200	2,800	4,900
35	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	15	MH200/1	232	3.48	Wall Switch	15	MH200/1	232	3.48	Occ Sensor	0.00	3,200	2,800	1,392
36	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	2	F42LL CES20/1	60	0.12	Wall Switch	2	F42LL CES20/1	60	0.12	Occ Sensor	0.00	3,200	2,800	48
38	65 West Greenbrook Road, North Caldwell, NJ 07000	1	401	4	CFT40/3-BX	102	0.10	Wall Switch	4	CFT40/3-BX	102	0.10	Occ Sensor	0.00	3,200	2,800	163
39	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401C	6	CFT40/3-BX	102	0.61	Wall Switch	6	CFT40/3-BX	102	0.61	Occ Sensor	0.00	3,200	2,800	245
40	65 West Greenbrook Road, North Caldwell, NJ 07006	1	403	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
41	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401D	1	F42LL	60	0.06	Wall Switch	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,800	24
42	b5 West Greenbrook Road, North Caldwell, NJ 07006	1	401B	4	CET 40/3-BX	102	0.41	Wall Switch	4	CET40/2-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
43 44	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401A 401F	4	F4211		0.41	Wall Switch	4	F4211	102 60	0.41	Occ Sensor	0.00	3,200	2,800	72
45	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402A	6	CFT40/3-BX	102	0.61	Wall Switch	6	CFT40/3-BX	102	0.61	Occ Sensor	0.00	3,200	2,800	245
46	65 West Greenbrook Road, North Caldwell, NJ 07006	1	400	1	F43LL	93	0.09	Wall Switch	1	F43LL	93	0.09	Occ Sensor	0.00	3,200	2,800	37
47	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402	12	CFT40/3-BX	102	1.22	Wall Switch	12	CFT40/3-BX	102	1.22	Occ Sensor	0.00	3,200	2,800	490
48	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402B	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
49	65 West Greenbrook Road, North Caldwell, NJ 07006	1	4020	4	CFT/0/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
51	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402E	3	CFT40/3-BX	102	0.41	Wall Switch	3	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3.200	2,800	103
52	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402F	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
53	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402G	6	CFT40/3-BX	102	0.61	Wall Switch	6	CFT40/3-BX	102	0.61	Occ Sensor	0.00	3,200	2,800	245
54	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402H	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
55	65 West Greenbrook Road, North Caldwell, NJ 07006	1	405	12	F42LL	60	0.72	Wall Switch	12	F42LL	60	0.72	Occ Sensor	0.00	3,200	2,800	288
56	65 West Greenbrook Road, North Caldwell, NJ 07006	1	404 407	18 21	F41LL F41L1	<u>32</u> 32	0.58	Wall Switch	18 21	F41LL F4111	32	0.58	Occ Sensor	0.00	3,200	2,800	230
58	65 West Greenbrook Road, North Caldwell, NJ 07006	1	406 WOMENS TR	5	F43LL	93	0.47	Wall Switch	5	F43LL	93	0.47	Occ Sensor	0.00	3,200	2,800	186
59	65 West Greenbrook Road, North Caldwell, NJ 07006	1	408 CUST	1	F42LL	60	0.06	Wall Switch	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,800	24
60	65 West Greenbrook Road, North Caldwell, NJ 07006	1	501 MENS TR	5	F43LL	93	0.47	Wall Switch	5	F43LL	93	0.47	Occ Sensor	0.00	3,200	2,800	186
61	65 West Greenbrook Road, North Caldwell, NJ 07006	1	409	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	0.58	Occ Sensor	0.00	3,200	2,800	230
62	bo west Greenbrook Road, North Caldwell, NJ 07006	1	318	9	F43LL	93	0.84	vvali Switch	9	F43LL	93	u.84 (	UCC Sensor	0.00	3,200	2,800	335

File: 01 23954 - West Essex RSD HS ECMs (Rev 1) Worksheet: ECM-2 Lighting Controls

## **INSTRUCTIONS**

Use one line for each fixture type in a room or area.

5/24/2012 7:38 AM

						PRE-INSTALLA	TION		POST-INSTA								
				Pre											Baseline	Proposed	
				Fixt.			Pre kW /			Post Fixt	Post Watts/	Post kW /		kW	Annual	Annual	Annual kWh
Line Item	Building	Floor	Area Description	No.	Pre Fixt Code	Pre Watts / Fixt	Space	Existing Control	Post Fixt No.	Code	Fixt	Space	Proposed Control	Saved	Hours	Hours	Saved
Integer line	Building Address	Floor fixture	Description of location that matches site	# of	Code from Wattage	Watts/Fixt from	(Pre	Pre-installation control	Number of	Code from	Watts/Fixt from	(Post	Post-installation control device	Pre	Existing	Proposed	(PreFixt #*PreWatts/Fixt *
number		is on	map	existing	Iable	vvattage lable	(Pre Fixt)	device	Tixtures after	vvattage i able	vvattage Table	(Post Fixt)		KVV/Space - Post	annual nours	for the usage	Baseline Hrs) -
				lixtures			No.)		Terronic			No.)		kW/Space	aroup	group	Fixt * Proposed
							,								3 +	9.001	Hours)
63	65 West Greenbrook Road, North Caldwell, NJ 07006	1	312 WOMEN TR	3	F41LL	32	0.10	Wall Switch	3	F41LL	32	2 0.10	Occ Sensor	0.00	3,200	2,800	38
64	65 West Greenbrook Road, North Caldwell, NJ 07006	1	312 WOMEN TR	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
65	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313	10	F43LL	93	0.93	Wall Switch	10	F43LL	93	3 0.93	Occ Sensor	0.00	3,200	2,800	372
67	65 West Greenbrook Road, North Caldwell, NJ 07000	1	313B	2	F43LL F43LL	93	0.19	Wall Switch	2	F43LL F43LL	93	3 0.19	Occ Sensor	0.00	3,200	2,800	74
68	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313C	6	F43LL	93	0.10	Wall Switch	6	F43LL	93	3 0.56	Occ Sensor	0.00	3,200	2,800	223
69	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313E	2	F43LL	93	0.19	Wall Switch	2	F43LL	93	3 0.19	Occ Sensor	0.00	3,200	2,800	74
70	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313F	4	F43LL	93	0.37	Wall Switch	4	F43LL	93	3 0.37	Occ Sensor	0.00	3,200	2,800	149
71	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313G	9	F43LL	93	0.84	Wall Switch	9	F43LL	93	3 0.84	Occ Sensor	0.00	3,200	2,800	335
72	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313H STORAGE	3	F41LL	32	0.10	Wall Switch	3	F41LL	32	2 0.10	Occ Sensor	0.00	3,200	2,800	38
73	65 West Greenbrook Road, North Caldwell, NJ 07006	1	SALAMONE LAB	23	F43LL F43LI	93	2 14	Wall Switch	23	F43LL F43LI	93	3 2 1 4	Occ Sensor	0.00	3,200	2,800	856
75	65 West Greenbrook Road, North Caldwell, NJ 07006	1	314 MEN TR	3	F43LL	93	0.28	Wall Switch	3	F43LL	93	3 0.28	Occ Sensor	0.00	3,200	2,800	112
76	65 West Greenbrook Road, North Caldwell, NJ 07006	1	314 MEN TR	1	F43LL	93	0.09	Wall Switch	1	F43LL	93	3 0.09	Occ Sensor	0.00	3,200	2,800	37
77	65 West Greenbrook Road, North Caldwell, NJ 07006	1	311	9	F44LL	118	1.06	Wall Switch	9	F44LL	118	3 1.06	Occ Sensor	0.00	3,200	2,800	425
78	65 West Greenbrook Road, North Caldwell, NJ 07006	1	309	6	F42LL	60	0.36	Wall Switch	6	F42LL	60	0.36	Occ Sensor	0.00	3,200	2,800	144
79	65 West Greenbrook Road, North Caldwell, NJ 07006	1	307	9	F44LL	118	1.06	wall Switch	9		118	5 1.06 3 1.06	Occ Sensor	0.00	3,200	2,800	425
81	65 West Greenbrook Road. North Caldwell, NJ 07006	1	306	9	F4411	110	1.00	Wall Switch	9	F4411	110	3 1.00	Occ Sensor	0.00	3,200	2,800	420
82	65 West Greenbrook Road, North Caldwell, NJ 07006	1	304	9	F44LL	118	1.06	Wall Switch	9	F44LL	118	3 1.06	Occ Sensor	0.00	3,200	2,800	425
83	65 West Greenbrook Road, North Caldwell, NJ 07006	1	303	12	F44LL	118	1.42	Wall Switch	12	F44LL	118	3 1.42	Occ Sensor	0.00	3,200	2,800	566
84	65 West Greenbrook Road, North Caldwell, NJ 07006	1	302	12	F44LL	118	1.42	Wall Switch	12	F44LL	118	3 1.42	Occ Sensor	0.00	3,200	2,800	566
85	65 West Greenbrook Road, North Caldwell, NJ 07006	1	301	9	F44LL	118	1.06	Wall Switch	9	F44LL	118	3 1.06	Occ Sensor	0.00	3,200	2,800	425
86	65 West Greenbrook Road, North Caldwell, NJ 07006	1	300	9	F44LL CES20/1	118	1.06	Wall Switch	9	F44LL	118	3 1.06	Occ Sensor	0.00	3,200	2,800	425
88	65 West Greenbrook Road, North Caldwell, NJ 07006	1	217	15	F42LL	60	0.12	Occ Sensor	15	F42LL	60	0.12	Occ Sensor	0.00	3,200	2,800	360
89	65 West Greenbrook Road, North Caldwell, NJ 07006	1	215	15	F42LL	60	0.90	Occ Sensor	15	F42LL	60	0.90	Occ Sensor	0.00	3,200	2,800	360
90	65 West Greenbrook Road, North Caldwell, NJ 07006	1	211	32	F42LL	60	1.92	Occ Sensor	32	F42LL	60	0 1.92	Occ Sensor	0.00	3,200	2,800	768
91	65 West Greenbrook Road, North Caldwell, NJ 07006	1	208	24	F42LL	60	1.44	Occ Sensor	24	F42LL	60	0 1.44	Occ Sensor	0.00	3,200	2,800	576
92	65 West Greenbrook Road, North Caldwell, NJ 07006	1	206	8	F43LL	93	0.74	Occ Sensor	8	F43LL	93	3 0.74	Occ Sensor	0.00	3,200	2,800	298
93	65 West Greenbrook Road, North Caldwell, NJ 07006	1	204 210 WOMEN TR	24	F42LL CES20/1	60 20	1.44	Wall Switch	1	CES20/1	60	1.44	Occ Sensor	0.00	3,200	2,800	5/6
95	65 West Greenbrook Road, North Caldwell, NJ 07006	1	210 WOMEN TR	3	F43LL	93	0.02	Wall Switch	3	F43LL	93	3 0.28	Occ Sensor	0.00	3,200	2,800	112
96	65 West Greenbrook Road, North Caldwell, NJ 07006	1	214 MEN TR	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
97	65 West Greenbrook Road, North Caldwell, NJ 07006	1	214 MEN TR	3	F43LL	93	0.28	Wall Switch	3	F43LL	93	3 0.28	Occ Sensor	0.00	3,200	2,800	112
98	65 West Greenbrook Road, North Caldwell, NJ 07006	1	207	24	F42LL	60	1.44	Occ Sensor	24	F42LL	60	0 1.44	Occ Sensor	0.00	3,200	2,800	576
99	65 West Greenbrook Road, North Caldwell, NJ 07006	1	209	4	F43LL	93	0.37	Wall Switch	4	F43LL	93	$\frac{3}{2}$ 0.37	Occ Sensor	0.00	3,200	2,800	149
100	65 West Greenbrook Road, North Caldwell, NJ 07006	1	209A	24	F43LL F42LI	93	0.37	Occ Sensor	24	F43LL F42LI	93	0.37	Occ Sensor	0.00	3,200	2,800	576
101	65 West Greenbrook Road, North Caldwell, NJ 07006	1	203A	4	F43LL	93	0.37	Wall Switch	4	F43LL	93	3 0.37	Occ Sensor	0.00	3,200	2,800	149
103	65 West Greenbrook Road, North Caldwell, NJ 07006	1	203	4	F43LL	93	0.37	Wall Switch	4	F43LL	93	3 0.37	Occ Sensor	0.00	3,200	2,800	149
104	65 West Greenbrook Road, North Caldwell, NJ 07006	1	201	24	F42LL	60	1.44	Occ Sensor	24	F42LL	60	0 1.44	Occ Sensor	0.00	3,200	2,800	576
105	65 West Greenbrook Road, North Caldwell, NJ 07006	1	202	8	F42LL	60	0.48	Occ Sensor	8	F42LL	60	0.48	Occ Sensor	0.00	3,200	2,800	192
108	65 West Greenbrook Road, North Caldwell, NJ 07006	1	VESTIBUI E	9	F42LL F42LI	60	0.54	Occ Sensor	9	F42LL F42LL	60	0.54	Occ Sensor	0.00	3,200	2,800	48
108	65 West Greenbrook Road, North Caldwell, NJ 07006	1	503	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
109	65 West Greenbrook Road, North Caldwell, NJ 07006	1	505	3	F42LL	60	0.18	Wall Switch	3	F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	72
110	65 West Greenbrook Road, North Caldwell, NJ 07006	1	507	10	F42LL	60	0.60	Wall Switch	10	F42LL	60	0.60	Occ Sensor	0.00	3,200	2,800	240
111	65 West Greenbrook Road, North Caldwell, NJ 07006		509	24	F42LL	60	1.44	Wall Switch	24	F42LL	60		Occ Sensor	0.00	3,200	2,800	576
112	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	4 68	F44LL F42I I	811 00	0.47 4 NR	Wall Switch	4 68	F44LL F42I I	311 1A	) <u>0.47</u> ) <u>4</u> 08	Occ Sensor	0.00	3,200 <u>3</u> 200	2,800 2 800	1 632
114	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	30	CFS20/1	20	0.60	Wall Switch	30	CFS20/1	20	0.60	Occ Sensor	0.00	3,200	2,800	240
115	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	8	F43LL	93	0.74	Wall Switch	8	F43LL	93	3 0.74	Occ Sensor	0.00	3,200	2,800	298
116	65 West Greenbrook Road, North Caldwell, NJ 07006	2	510B	2	F43LL	93	0.19	Wall Switch	2	F43LL	93	3 0.19	Occ Sensor	0.00	3,200	2,800	74
117	65 West Greenbrook Road, North Caldwell, NJ 07006	2	510A	8	F43LL	93	0.74	Wall Switch	8	F43LL	93	3 0.74	Occ Sensor	0.00	3,200	2,800	298
118	65 West Greenbrook Road, North Caldwell, NJ 07006	2	510C 512A	3	F43LL F43LL	93	0.28	wall Switch	3	F43LL F43LL	93	0.28 U.28 ג חיב ח	Occ Sensor	0.00	3,200	2,800	112
120	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512	12	F42LL	60	0.37	Wall Switch	12	F42LL	60	0.37	Occ Sensor	0.00	3.200	2,800	288
121	65 West Greenbrook Road, North Caldwell, NJ 07006	2	511	24	F41LL	32	0.77	Wall Switch	24	F41LL	32	2 0.77	Occ Sensor	0.00	3,200	2,800	307
122	65 West Greenbrook Road, North Caldwell, NJ 07006	2	514	36	F44LL	118	4.25	Wall Switch	36	F44LL	118	3 4.25	Occ Sensor	0.00	3,200	2,800	1,699
123	65 West Greenbrook Road, North Caldwell, NJ 07006	2	510D	8	F44LL	118	0.94	Wall Switch	8	F44LL	118	8 0.94	Occ Sensor	0.00	3,200	2,800	378
124	65 West Greenbrook Road, North Caldwell, NJ 07006	2	513	12	F44LL	118	1.42	wall Switch	12	F44LL	118	5 1.42 D 0.54	Occ Sensor	0.00	3,200	2,800	566
125	65 West Greenbrook Road, North Caldwell, NJ 07006	2	515	12	F42LL F44[1	00 118	0.54	Wall Switch	9 12	F44LI	118	3 0.54 3 1.42	Occ Sensor	0.00	3,200	2,800	566
127	65 West Greenbrook Road, North Caldwell, NJ 07006	2	614 TR	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
128	65 West Greenbrook Road, North Caldwell, NJ 07006	2	614 TR	3	F42LL	60	0.18	Wall Switch	3	F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	72
129	65 West Greenbrook Road, North Caldwell, NJ 07006	2	610 CUSTODIAL	2	F42LL	60	0.12	Wall Switch	2	F42LL	60	0.12	Occ Sensor	0.00	3,200	2,800	48
130	65 West Greenbrook Road, North Caldwell, NJ 07006	2	612 IR		CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
131	65 West Greenbrook Road, North Caldwell, NJ 07006	2	608 TR	1	CFS20/1	20	0.18	Wall Switch	3	CFS20/1	20	) 0.18 ) 0.02	Occ Sensor	0.00	3,200	2,000	/2 8
133	65 West Greenbrook Road, North Caldwell, NJ 07006	2	608 TR	3	F42LL	60	0.18	Wall Switch	3	F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	72
134	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606	15	F44LL	118	1.77	Wall Switch	15	F44LL	118	3 1.77	Occ Sensor	0.00	3,200	2,800	708

<sup>5/24/2012</sup> 7:38 AM

						PRE-INSTALLA	TION		POST-INST	ALLATION				]			
Line Item Integer line number	<b>Building</b> Building Address	Floor Floor fixture is on	Area Description Description of location that matches site map	Pre Fixt. No. # of existing fixtures	<b>Pre Fixt Code</b> Code from Wattage Table	Pre Watts / Fixt Watts/Fixt from Wattage Table	Pre kW / Space (Pre Watts/Fixt) * (Pre Fixt No.)	Existing Control Pre-installation control device	Post Fixt No. Number of fixtures after retrofit	Post Fixt Code Code from Wattage Table	Post Watts/ Fixt Watts/Fixt from Wattage Table	Post kW / Space (Post Watts/Fixt) * (Post Fixt No.)	Proposed Control Post-installation control device	<b>kW</b> <b>Saved</b> Pre kW/Space - Post kW/Space	Baseline Annual Hours Existing annual hours for the usage group	Proposed Annual Hours Proposed annual hours for the usage group	Annual kWh Saved (PreFixt #*PreWatts/Fixt * Baseline Hrs) - e (PostFixt#*PostWatts/ Fixt * Proposed Hours)
135	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606	31	CFS20/1	20	0.62	Wall Switch	31	CFS20/1	20	0.62	Occ Sensor	0.00	3,200	2,80	0 248
136	65 West Greenbrook Road, North Caldwell, NJ 07006	2	600	15	F44LL	118	1.77	Wall Switch	15	F44LL	118	3 1.77	Occ Sensor	0.00	3,200	2,80	0 708
137	65 West Greenbrook Road, North Caldwell, NJ 07006	2	600	31	CFS20/1	20	0.62	Wall Switch	31	CFS20/1	20	0.62	Occ Sensor	0.00	3,200	2,800	0 248
138	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606B	5	F41LL	32	0.16	Wall Switch	5	F41LL	32	2 0.16	Occ Sensor	0.00	3,200	2,800	$\frac{1}{2}$ 64
139	65 West Greenbrook Road, North Caldwell, NJ 07006	2	602	6	CFT40/3-BX	102	0.71	Wall Switch	6	CFT40/3-BX	102	2 0.71	Occ Sensor	0.00	3,200	2,80	0 245
141	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604	8	CFT40/3-BX	102	0.82	Wall Switch	8	CFT40/3-BX	102	2 0.82	Occ Sensor	0.00	3,200	2,800	0 326
142	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604	9	CFT40/3-BX	102	0.92	Wall Switch	9	CFT40/3-BX	102	2 0.92	Occ Sensor	0.00	3,200	2,800	0 367
143	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604A	15	CFT40/3-BX	102	1.53	Wall Switch	15	CFT40/3-BX	102	2 1.53	Occ Sensor	0.00	3,200	2,800	<u>) 612</u>
144	65 West Greenbrook Road, North Caldwell, NJ 07006	2	6047	2	1100/1	100	0.80	Wall Switch	2	1100/1	100	0.80	Occ Sensor	0.00	3,200	2,800	0 80
146	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604K	2	F42LL	60	0.12	Wall Switch	2	F42LL	60	0.12	Occ Sensor	0.00	3,200	2,80	0 48
147	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604F	1	1100/1	100	0.10	Wall Switch	1	1100/1	100	0.10	Occ Sensor	0.00	3,200	2,800	0 40
148	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604C	1	F42LL	60 100	0.06	Wall Switch	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,800	$\frac{3}{0}$ 24
149	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604B	7	F41LL	32	0.20	Wall Switch	7	F41LL	32	2 0.20	Occ Sensor	0.00	3,200	2,80	0 90
151	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604E	1	F23LL	52	0.05	Wall Switch	1	F23LL	52	2 0.05	Occ Sensor	0.00	3,200	2,80	0 21
152	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604G	2	F42LL	60	0.12	Wall Switch	2	F42LL	60	0.12	Occ Sensor	0.00	3,200	2,800	0 48
153	65 West Greenbrook Road, North Caldwell, NJ 07006	1	604H 604I	1	CFT40/3-BX	93	0.09	Wall Switch	1	F43LL CFT40/3-BX	93	0.09	Occ Sensor	0.00	3,200	2,800	$\frac{3}{0}$ $\frac{37}{163}$
155	65 West Greenbrook Road, North Caldwell, NJ 07006	1	604L	4	CFS20/1	20	0.08	Wall Switch	4	CFS20/1	20	0.08	Occ Sensor	0.00	3,200	2,800	0 32
156	65 West Greenbrook Road, North Caldwell, NJ 07006	1	606A	12	F43LL	93	1.12	Wall Switch	12	F43LL	93	3 1.12	Occ Sensor	0.00	3,200	2,800	0 446
157	65 West Greenbrook Road, North Caldwell, NJ 07006	1	620A	8	CFT40/3-BX	102	0.82	Wall Switch	8	CFT40/3-BX	102	2 0.82	Occ Sensor	0.00	3,200	2,800	<u>) 326</u>
158	65 West Greenbrook Road, North Caldwell, NJ 07006	1	616	2	F42LL	60	0.12	Wall Switch	12	F42LL	60	0.12	Occ Sensor	0.00	3,200	2,800	<u> </u>
160	65 West Greenbrook Road, North Caldwell, NJ 07006	1	701	9	F41LL	32	0.29	Wall Switch	9	F41LL	32	2 0.29	Occ Sensor	0.00	3,200	2,80	0 115
161	65 West Greenbrook Road, North Caldwell, NJ 07006	1	700A	2	F42LL	60	0.12	Wall Switch	2	F42LL	60	0.12	Occ Sensor	0.00	3,200	2,800	0 48
162	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702	/	F42LL	60 60	0.42	Wall Switch	/	F42LL F42LL	60	0.42	Occ Sensor	0.00	3,200	2,800	$\frac{168}{0}$
164	65 West Greenbrook Road, North Caldwell, NJ 07006	1	704A	6	F42LL	60	0.12	Wall Switch	6	F42LL	60	0.36	Occ Sensor	0.00	3,200	2,80	0 144
165	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702A	3	, F42LL	60	0.18	Wall Switch	3	F42LL	60	0.18	Occ Sensor	0.00	3,200	2,80	0 72
166	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702B	3	F42LL	60	0.18	Occ Sensor	3	F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	0 72
167	65 West Greenbrook Road, North Caldwell, NJ 07006	1	700B 700 ELECT	2	F42LL F42L1	60 60	0.12	Wall Switch	2	F42LL F42L1	60	0.12	Occ Sensor	0.00	3,200	2,800	$\frac{3}{0}$ 48 0 24
169	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622	14	F42LL	60	0.84	Wall Switch	14	F42LL	60	0.84	Occ Sensor	0.00	3,200	2,80	0 336
170	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622G	4	F42LL	60	0.24	Wall Switch	4	F42LL	60	0.24	Occ Sensor	0.00	3,200	2,800	0 96
171	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622D STORAGE	5	F42LL	60	0.30	Wall Switch	5	F42LL	60	0.30	Occ Sensor	0.00	3,200	2,800	$\frac{120}{2}$
172	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622J	10	F42LL	60	0.60	Wall Switch	10	F42LL	60	0.10	Occ Sensor	0.00	3,200	2,80	0 240
174	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622C	1	F42LL	60	0.06	Wall Switch	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,800	0 24
175	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622B	3	F42LL	60	0.18	Wall Switch	3	F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	<u>) 72</u>
176	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622A 622H	6	F42LL F42LL	60	0.18	Wall Switch	3	F42LL F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	$\frac{1}{2}$ $\frac{72}{144}$
178	65 West Greenbrook Road, North Caldwell, NJ 07006	1	624	4	F41LL	32	0.13	Wall Switch	4	F41LL	32	2 0.13	Occ Sensor	0.00	3,200	2,80	0 51
179	65 West Greenbrook Road, North Caldwell, NJ 07006	1	626	2	F41LL	32	0.06	Wall Switch	2	F41LL	32	2 0.06	Occ Sensor	0.00	3,200	2,800	0 26
180	65 West Greenbrook Road, North Caldwell, NJ 07006	1	628	18	F41LL	32	0.58	Wall Switch	18	F41LL F43U	32	2 0.58	Occ Sensor	0.00	3,200	2,800	$\frac{3}{230}$
181	65 West Greenbrook Road, North Caldwell, NJ 07006	1	630A	12	F43LL	93	0.09	Wall Switch	1	F43LL	93	3 0.09	Occ Sensor	0.00	3,200	2,80	0 37
183	65 West Greenbrook Road, North Caldwell, NJ 07006	1	630	1	F42LL	60	0.06	Wall Switch	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,80	0 24
184	65 West Greenbrook Road, North Caldwell, NJ 07006	1	901	3	F43LL	93	0.28	Wall Switch	3	F43LL	93	3 0.28	Occ Sensor	0.00	3,200	2,800	<u>) 112</u>
185	65 West Greenbrook Road, North Caldwell, NJ 07006	1	902A	1.5	F43LL	93	1.40	Wall Switch	15	F43LL	<u>60</u>	3 0.06 3 1.40	Occ Sensor	0.00	3,200	2,800	0 558
187	65 West Greenbrook Road, North Caldwell, NJ 07006	1	634	1	F41LL	32	0.03	Wall Switch	1	F41LL	32	2 0.03	Occ Sensor	0.00	3,200	2,80	0 13
188	65 West Greenbrook Road, North Caldwell, NJ 07006	1	632	2	F43LL	93	0.19	Wall Switch	2	F43LL	93	3 0.19	Occ Sensor	0.00	3,200	2,800	0 74
189	65 West Greenbrook Road, North Caldwell, NJ 07006	1	<u>636</u> 930	30	F43LL MH400/1	93 458	0.28	Wall Switch Wall Switch	30	F43LL MH400/1	93 458	3 0.28 3 13.74	Occ Sensor	0.00	3,200	2,800	$\frac{112}{0}$
190	65 West Greenbrook Road, North Caldwell, NJ 07006	1	930	1	F42LL	60	0.06	Wall Switch	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,80	0 24
192	65 West Greenbrook Road, North Caldwell, NJ 07006	1	921	7	F41LL	32	0.22	Wall Switch	7	F41LL	32	2 0.22	Occ Sensor	0.00	3,200	2,800	0 90
193	65 West Greenbrook Road, North Caldwell, NJ 07006	1	931	2	F42LL	60	0.12	Wall Switch	2	F42LL	60	0 0.12	Occ Sensor	0.00	3,200	2,800	$\frac{3}{0}$ $\frac{48}{5406}$
194	65 West Greenbrook Road, North Caldwell, NJ 07006	1	914	2	F42LL	60	0.12	Wall Switch	2	F42LL	430	0.12	Occ Sensor	0.00	3,200	2,80	0 48
196	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916F	12	F41LL	32	0.38	Wall Switch	12	F41LL	32	2 0.38	Occ Sensor	0.00	3,200	2,80	0 154
197	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916H	4	F42LL	60	0.24	Wall Switch	4	F42LL	60	0.24	Occ Sensor	0.00	3,200	2,800	<u>) 96</u>
198	65 West Greenbrook Road, North Caldwell, NJ 07006	1	9166	3	F42LL F42LI	60 60	0.12	Wall Switch	2	F42LL F42LI	18	0.12 0 18	Occ Sensor	0.00	3,200	2,800	$\frac{3}{0}$ $\frac{48}{72}$
200	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916L	8	F42LL	60	0.48	Wall Switch	8	F42LL	60	0.48	Occ Sensor	0.00	3,200	2,80	0 192
201	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916L	5	F41LL	32	0.16	Wall Switch	5	F41LL	32	2 0.16	Occ Sensor	0.00	3,200	2,800	<u>) 64</u>
202	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916A 916	6	F41LL F41LL	32	0.19 1 02	wall Switch	6 30	F41LL F4111	32	2 0.19 2 1.02	Occ Sensor	0.00	3,200	2,800	$\frac{1}{0}$ $\frac{77}{10}$
203	65 West Greenbrook Road, North Caldwell, NJ 07006	1	907	2	F42LL	60	0.12	Wall Switch	2	F42LL	60	0.12	Occ Sensor	0.00	3,200	2,80	0 48
205	65 West Greenbrook Road, North Caldwell, NJ 07006	1	907	18	CFS20/1	20	0.36	Wall Switch	18	CFS20/1	20	0.36	Occ Sensor	0.00	3,200	2,800	0 144
206	65 West Greenbrook Road, North Caldwell, NJ 07006	1	911	3	F42LL	60	0.18	Wall Switch	3	F42LL	60	0.18 ע	Occ Sensor	0.00	3,200	2,800	J 72

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						PRE-INSTALLA	TION		POST-INST	ALLATION							
				Pre Fixt			Pro kW /			Post Fixt	Post Watts/	Post kW//		k/M	Baseline	Proposed	Annual kWb
Line Item	Building	Floor	Area Description	No.	Pre Fixt Code	Pre Watts / Fixt	Space	Existing Control	Post Fixt No.	Code	Fixt	Space	Proposed Control	Saved	Hours	Hours	Saved
Integer line	Building Address	Floor fixture	Description of location that matches site	# of	Code from Wattage	Watts/Fixt from	(Pre	Pre-installation control	Number of	Code from	Watts/Fixt from	(Post	Post-installation control device	Pre	Existing	Proposed	(PreFixt
number		is on	map	existing	Table	Wattage Table	Watts/Fixt) *	device	fixtures after	Wattage Table	Wattage Table	Watts/Fixt) *		kW/Space -	annual hours	annual hours	#*PreWatts/Fixt * Baseline Hrs) -
				fixtures			(Pre Fixt		retrofit			(Post Fixt		Post	for the usage	for the usage	(PostFixt#*PostWatts/ Fixt * Proposed
							INO.)					INO.)		kw/Space	group	group	Hours)
207	65 West Greenbrook Road, North Caldwell, NJ 07006	1	913	3	F42LL	60	0.18	Wall Switch	3	F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	72
208	65 West Greenbrook Road, North Caldwell, NJ 07006	1	910	30	F42LL	60	1.80	Wall Switch	30	F42LL	60	1.80	Occ Sensor	0.00	3,200	2,800	720
209	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916	6	F42LL	60	0.36	Occ Sensor	6	F42LL	60	0.36	Occ Sensor	0.00	3,200	2,800	144
210	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904 904C	30	F42LL F42LI	60	0.36	Wall Switch		F42LL F42LI	60	0.36	Occ Sensor	0.00	3,200	2,800	144
212	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904B	2	CFT40/3-BX	102	0.20	Wall Switch	2	CFT40/3-BX	102	2 0.20	Occ Sensor	0.00	3,200	2,800	82
213	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904D	2	CFT40/3-BX	102	0.20	Wall Switch	2	CFT40/3-BX	102	2 0.20	Occ Sensor	0.00	3,200	2,800	82
214	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922B	3	F42LL	60	0.18	Wall Switch	3	F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	72
215	65 West Greenbrook Road, North Caldwell, NJ 07006	1	9220	1	F42LL F43LL	60	0.06	Wall Switch	1	F42LL F43LL	60	0.06	Occ Sensor	0.00	3,200	2,800	24
210	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922F	6	F42LL	60	0.36	Wall Switch	6	F42LL	60	0.36	Occ Sensor	0.00	3,200	2,800	143
218	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922F	8	F41LL	32	0.26	Wall Switch	8	F41LL	32	2 0.26	Occ Sensor	0.00	3,200	2,800	102
219	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922	28	F41LL	32	0.90	Wall Switch	28	F41LL	32	2 0.90	Occ Sensor	0.00	3,200	2,800	358
220	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922H	2	F42LL E42LL	60	0.12	Wall Switch	2	F42LL	60	0.12	Occ Sensor	0.00	3,200	2,800	48
221	65 West Greenbrook Road, North Caldwell, NJ 07006	1	819	3	F42LL F42LL	60	0.18	Wall Switch	3	F42LL F42LL	60	0.18	Occ Sensor	0.00	3,200	2,800	72
223	65 West Greenbrook Road, North Caldwell, NJ 07006	1	805	12	F42LL	60	0.72	Wall Switch	12	F42LL	60	0.72	Occ Sensor	0.00	3,200	2,800	288
224	65 West Greenbrook Road, North Caldwell, NJ 07006	1	808	12	F42LL	60	0.72	Wall Switch	12	F42LL	60	0.72	Occ Sensor	0.00	3,200	2,800	288
225	65 West Greenbrook Road, North Caldwell, NJ 07006	1	810	8	F42LL	60	0.48	Wall Switch	8	F42LL	60	0.48	Occ Sensor	0.00	3,200	2,800	192
226	65 West Greenbrook Road, North Caldwell, NJ 07006	1	807	12	F42LL F42LI	60 60	0.72	Wall Switch	12	F42LL F42LI	60	0.72	Occ Sensor	0.00	3,200	2,800	288
228	65 West Greenbrook Road, North Caldwell, NJ 07006	1	811	12	F42LL	60	0.72	Wall Switch	12	F42LL	60	0.72	Occ Sensor	0.00	3,200	2,800	288
229	65 West Greenbrook Road, North Caldwell, NJ 07006	1	813	12	F42LL	60	0.72	Wall Switch	12	F42LL	60	0.72	Occ Sensor	0.00	3,200	2,800	288
230	65 West Greenbrook Road, North Caldwell, NJ 07006	1	815	15	F42LL	60	0.90	Wall Switch	15	F42LL	60	0.90	Occ Sensor	0.00	3,200	2,800	360
231	65 West Greenbrook Road, North Caldwell, NJ 07006	1	815A 803A	4	F43LL F43LL	93	0.37	Wall Switch	4	F43LL F43LL	93	<u> </u>	Occ Sensor	0.00	3,200	2,800	149
232	65 West Greenbrook Road, North Caldwell, NJ 07006	1	801A	4	F43LL	93	0.37	Wall Switch	4	F43LL	93	0.37 0.37	Occ Sensor	0.00	3,200	2,800	149
234	65 West Greenbrook Road, North Caldwell, NJ 07006	1	801	3	CFS20/1	20	0.06	Wall Switch	3	CFS20/1	20	0.06	Occ Sensor	0.00	3,200	2,800	24
235	65 West Greenbrook Road, North Caldwell, NJ 07006	1	801	15	F42LL	60	0.90	Wall Switch	15	F42LL	60	0.90	Occ Sensor	0.00	3,200	2,800	360
236	65 West Greenbrook Road, North Caldwell, NJ 07006	1	803	3	CFS20/1	20	0.06	Wall Switch	3	CFS20/1	20	0.06	Occ Sensor	0.00	3,200	2,800	24
237	65 West Greenbrook Road, North Caldwell, NJ 07006	1	731	15	F42LL F41LL	60 32	0.90	Wall Switch	15	F42LL F41LL	32	0.58	Occ Sensor	0.00	3,200	2,800	230
239	65 West Greenbrook Road, North Caldwell, NJ 07006	1	730	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
240	65 West Greenbrook Road, North Caldwell, NJ 07006	1	729	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
241	65 West Greenbrook Road, North Caldwell, NJ 07006	1	728	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
242	65 West Greenbrook Road, North Caldwell, NJ 07006	1	726	18	F41LL F41LL	32	0.58	Wall Switch	18	F41LL F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
243	65 West Greenbrook Road, North Caldwell, NJ 07006	1	725	18	F41LL	32	0.58	Occ Sensor	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
245	65 West Greenbrook Road, North Caldwell, NJ 07006	1	722	4	F41LL	32	0.13	Occ Sensor	4	F41LL	32	2 0.13	Occ Sensor	0.00	3,200	2,800	51
246	65 West Greenbrook Road, North Caldwell, NJ 07006	1	718	1	F42LL	60	0.06	Occ Sensor	1	F42LL	60	0.06	Occ Sensor	0.00	3,200	2,800	24
247	65 West Greenbrook Road, North Caldwell, NJ 07006	1	720	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
248	65 West Greenbrook Road, North Caldwell, NJ 07006	1	720	1	CFS20/1	20	0.20	Wall Switch	1	CFS20/1	93	0.28	Occ Sensor	0.00	3,200	2,800	8
250	65 West Greenbrook Road, North Caldwell, NJ 07006	1	716	3	F43LL	93	0.28	Wall Switch	3	F43LL	93	3 0.28	Occ Sensor	0.00	3,200	2,800	112
251	65 West Greenbrook Road, North Caldwell, NJ 07006	1	721	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
252	65 West Greenbrook Road, North Caldwell, NJ 07006	1	723	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
253	65 West Greenbrook Road, North Caldwell, NJ 07006	1	719	18	F41LL F41LI	32	0.58	Wall Switch	18	F41LL F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
255	65 West Greenbrook Road, North Caldwell, NJ 07006	11	715	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	20.58	Occ Sensor	0.00	3,200	2,800	230
256	65 West Greenbrook Road, North Caldwell, NJ 07006	1	713	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	0.58	Occ Sensor	0.00	3,200	2,800	230
257	65 West Greenbrook Road, North Caldwell, NJ 07006	1	711	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	0.58	Occ Sensor	0.00	3,200	2,800	230
258 259	65 West Greenbrook Road, North Caldwell, NJ 07006	1	709	18 18	F41LL F41LL	32	0.58	Wall Switch	18 18	F41LL F41LL	32	2 0.58 2 0.58	Occ Sensor	0.00	3,200	2,800	230
260	65 West Greenbrook Road, North Caldwell, NJ 07006	1	707	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
261	65 West Greenbrook Road, North Caldwell, NJ 07006	1	706	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
262	65 West Greenbrook Road, North Caldwell, NJ 07006	1	705	18	F41LL	32	0.58	Wall Switch	18	F41LL	32	2 0.58	Occ Sensor	0.00	3,200	2,800	230
263	65 West Greenbrook Road, North Caldwell, NJ 07006	1	701	9	F41LL F/311	32	0.29	wall Switch	9	F41LL	32	0.29	UCC Sensor	0.00	3,200	2,800	115
265	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	109	FU2LL		6.54	Wall Switch	109	FU2LL	93 60	) 6.54	Occ Sensor	0.00	3,200	2,800	2.616
266	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	72	F42LL	60	4.32	Wall Switch	72	F42LL	60	4.32	Occ Sensor	0.00	3,200	2,800	1,728
267	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	2	F43LL	93	0.19	Wall Switch	2	F43LL	93	0.19	Occ Sensor	0.00	3,200	2,800	74
268	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	13	CFS20/1	20	0.26	Wall Switch	13	CFS20/1	20	0.26	Occ Sensor	0.00	3,200	2,800	104
269 270	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	24	F44LL F44I I	118 118	2.83	Wall Switch	24	F44LL F44H	118	2.83	Occ Sensor	0.00	3,200	2,800 2 800	1,133
271	65 West Greenbrook Road, North Caldwell, NJ 07006	1	906	6	F42LL	60	0.36	Wall Switch	6	F42LL	60	0.36	Occ Sensor	0.00	3,200	2,800	144
272	65 West Greenbrook Road, North Caldwell, NJ 07006	1	908	6	F42LL	60	0.36	Wall Switch	6	F42LL	60	0.36	Occ Sensor	0.00	3,200	2,800	144
273	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904A	4	F42LL	60	0.24	Wall Switch	4	F42LL	60	0.24	Occ Sensor	0.00	3,200	2,800	96
274	65 West Greenbrook Road, North Caldwell, NJ 07006	1	909	6	F42LL F42LL	60 60	0.36	wall Switch	6	F42LL F42LL	60	0.36	Occ Sensor	0.00	3,200	2,800	144
275	65 West Greenbrook Road, North Caldwell, NJ 07006	1	926	8	F42LL	60	0.30	Wall Switch	8	F42LL	60	0.30	Occ Sensor	0.00	3.200	2,800	192
277	65 West Greenbrook Road, North Caldwell, NJ 07006	1	928	6	F42LL	60	0.36	Wall Switch	6	F42LL	60	0.36	Occ Sensor	0.00	3,200	2,800	144
278	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1000	20	F42LL	60	1.20	Wall Switch	20	F42LL	60	1.20	Occ Sensor	0.00	3,200	2,800	480

<sup>5/24/2012</sup> 7:38 AM

						PRE-INSTALLA	TION		POST-INST	ALLATION				]			
				Pre											Baseline	Proposed	
				Fixt.			Pre kW /			Post Fixt	Post Watts/	Post kW /		kW	Annual	Annual	Annual kWh
Line Item	Building	Floor	Area Description	No.	Pre Fixt Code	Pre Watts / Fixt	Space	<b>Existing Control</b>	Post Fixt No.	Code	Fixt	Space	Proposed Control	Saved	Hours	Hours	Saved
Integer line	Building Address	Floor fixture	Description of location that matches site	# of	Code from Wattage	Watts/Fixt from	(Pre	Pre-installation control	Number of	Code from	Watts/Fixt from	(Post	Post-installation control device	Pre	Existing	Proposed	(PreFixt #*PreW/atts/Fixt *
number		is on	map	existing	Table	Wattage Table	Watts/Fixt) *	device	fixtures after	Wattage Table	Wattage Table	Watts/Fixt) *		kW/Space ·	annual hours	annual hours	Baseline Hrs) -
				fixtures			(Pre Fixt		retrofit			(Post Fixt		Post	for the usage	for the usage	(PostFixt#*PostWatts/ Fixt * Proposed
							INO.)					INO.)		kw/Space	group	group	Hours)
279	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1000A	5	5 F42LL	60	0.30	Wall Switch	5	F42LL	60	0.30	Occ Sensor	0.00	3,200	2,800	120
280	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1001, CLOSET & BATHROOM	20	) F42LL	60	1.20	Wall Switch	20	F42LL	60	1.20	Occ Sensor	0.00	3,200	2,800	480
281	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1002A	2	F42LL	60	0.24	Wall Switch	4	F42LL	60	0.24	Occ Sensor	0.00	3,200	2,800	96
282	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1002	18	F42LL	60	1.08	Wall Switch	18	F42LL	60	1.08	Occ Sensor	0.00	3,200	2,800	432
283	65 West Greenbrook Road, North Caldwell, NJ 07006	1	EXTERIOR	50	) MH400/1	458	22.90	Light Sensors	50	MH400/1	458	22.90	Light Sensors	0.00	4,368	2,184	50,014
		1													4,368	2,184	
				ļ													
														1			
						Total Pre kW	231.76	Total Post Fixt.	2,896.00		Total Post kW	231.76	Total kW Saved		Total Annu	al kWh Saved	133,556.80

## Existing Facilities Program Replacement & Controls Form:

Performance Based

Applicant Name:	West Essex Regional School District
Facility Name:	High School Building
Date:	3/26/2012

						PRE-INSTALLA			POST-IN	STALLATION							
				Pre Fixt.		Pre Watts /	Pre kW /		Post Fixt	Post Fixt	Post Watts/	Post kW /		kW	Baseline Annual	Proposed Annual	Annual kWh
Line Item	Building	Floor	Area Description	NO.	Pre Fixt Code		Space	Existing Control	NO.	Code	FIXt	Space	Proposed Control	Saved	Hours	Hours	Saved (DroEivt
Integer line	Building Address	Floor fixture	Description of location that matches site	# 01 evisting	Code from Wattage Table	Watts/Fixt from	(Pre Watts/Fixt) *	device	fixtures	Code from	Watts/Fixt from	(POSI Watts/Fixt) *	Post-installation control device	Pre kW/Space	Existing	Proposed	#*PreWatts/Fixt *
number		13 011	niap	fixtures	Wallage Table	Wallage Table	(Pre Fixt	device	after retrofit	Wallage Table	Wallage Table	(Post Fixt		Post	hours for the	for the usage	Baseline Hrs) - (PostFixt#*PostW
							No.)					No.)		kW/Space	usage group	group	atts/Fixt *
																	Proposed Hours)
																	1
Ex.	485 7th Ave, Suite 1006	10	Men's Room	3	F44ILL	112	0.34	Light Switch	3	F42ILL	59	0.18	Motion Sensor	0.16	3,000	2,000	654
			100		<b>E</b> (0)		4.50			<b>E</b> (00.011 )				0.04			
1	65 West Greenbrook Road, North Caldwell, NJ 07006	1	100	26	F42LL	60	1.56	Wall Switch	26	F42SSILL	48	1.25	Occ Sensor	0.31	3,200	2,800	1,498
2	65 West Greenbrook Road, North Caldwell, NJ 07006	1	102	27	F41LL F42LL		1.62	Wall Switch	27	F413SILL F42SSILL	20 48	1.30	Occ Sensor	0.01	3,200	2,800	1 555
4	65 West Greenbrook Road, North Caldwell, NJ 07006	1	102A	1	F41LL	32	0.03	Wall Switch	1	F41SSILL	26	0.03	Occ Sensor	0.02	3,200	2,800	30
5	65 West Greenbrook Road, North Caldwell, NJ 07006	1	102B	1	F43LL	93	0.09	Wall Switch	1	F43SSILL	72	0.07	Occ Sensor	0.02	3,200	2,800	96
6	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101	65	F42LL	60	3.90	Wall Switch	65	F42SSILL	48	3.12	Occ Sensor	0.78	3,200	2,800	3,744
7	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101A	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
8	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101A	1	UFS20/1 1100/1	20	0.02	Wall Switch	1	CF520/1 CF23/1	20	0.02	Occ Sensor	0.00	3,200	2,800	230
10	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101B	4	F42LL	60	0.10	Wall Switch	4	F42SSILL	48	0.19	Occ Sensor	0.05	3.200	2,800	233
11	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101C	8	F42LL	60	0.48	Wall Switch	8	F42SSILL	48	0.38	Occ Sensor	0.10	3,200	2,800	461
12	65 West Greenbrook Road, North Caldwell, NJ 07006	1	104	21	F42LL	60	1.26	Wall Switch	21	F42SSILL	48	1.01	Occ Sensor	0.25	3,200	2,800	1,210
13	65 West Greenbrook Road, North Caldwell, NJ 07006	1	103	45	F42LL	60	2.70	Wall Switch	45	F42SSILL	48	2.16	Occ Sensor	0.54	3,200	2,800	2,592
14	65 West Greenbrook Road, North Caldwell, NJ 07006	1	101 LOF I	21	F41LL F42LL	32	0.67	Wall Switch	21	F41SSILL	26	0.55	Occ Sensor	0.13	3,200	2,800	622
15	65 West Greenbrook Road, North Caldwell, NJ 07006	1	105	24	F42LL	60	1.44	Wall Switch	24	F42SSILL	40	1.15	Occ Sensor	0.29	3,200	2,800	1.382
17	65 West Greenbrook Road, North Caldwell, NJ 07006	1	105A	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	0.29	Occ Sensor	0.07	3,200	2,800	346
18	65 West Greenbrook Road, North Caldwell, NJ 07006	1	106	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47	Occ Sensor	0.11	3,200	2,800	533
19	65 West Greenbrook Road, North Caldwell, NJ 07006	1	106B	6	F41LL	32	0.19	Wall Switch	6	F41SSILL	26	0.16	Occ Sensor	0.04	3,200	2,800	178
20	65 West Greenbrook Road, North Caldwell, NJ 07006	1	108	4	F41LL	32	0.13	Wall Switch	4	F41SSILL	26	0.10	Occ Sensor	0.02	3,200	2,800	<u>118</u>
21	65 West Greenbrook Road, North Caldwell, NJ 07006	1	107	18	F41LL F42LL	32	0.58	Wall Switch	18	F415SILL F42SSILL	20 	0.47	Occ Sensor	0.11	3,200	2,800	1 094
23	65 West Greenbrook Road, North Caldwell, NJ 07006	1	107A	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
24	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	173
25	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111A	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	0.22	Occ Sensor	0.06	3,200	2,800	288
26	65 West Greenbrook Road, North Caldwell, NJ 07006	1	111B	6 18	F43LL E42LL	93	0.56	Wall Switch	6 18	F43SSILL E42SSILL	/2	0.43	Occ Sensor	0.13	3,200	2,800	576
28	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123A	8	F42LL	60	0.48	Occ Sensor	8	F42SSILL	48	0.38	Occ Sensor	0.22	3,200	2,800	461
29	65 West Greenbrook Road, North Caldwell, NJ 07006	1	113 MENS TR	2	F43LL	93	0.19	Wall Switch	2	F43SSILL	72	0.14	Occ Sensor	0.04	3,200	2,800	192
30	65 West Greenbrook Road, North Caldwell, NJ 07006	1	115 CUSTODIAN	1	l100/1	100	0.10	Wall Switch	1	CF23/1	29	0.03	Occ Sensor	0.07	3,200	2,800	239
31	65 West Greenbrook Road, North Caldwell, NJ 07006	1	117 WOMEN TR	2	F43LL	93	0.19	Wall Switch	2	F43SSILL	72	0.14	Occ Sensor	0.04	3,200	2,800	192
<u> </u>	65 West Greenbrook Road, North Caldwell, NJ 07006	1		10	F41LL CES20/1	32	0.32	Wall Switch	10	CES20/1	26	0.26	Occ Sensor	0.06	3,200	2,800	296
34	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	49	H250/1	250	12.25	Wall Switch	49	Custom Fixture 6	25	1.23	Occ Sensor	11.03	3,200	2,800	35.770
35	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	15	MH200/1	232	3.48	Wall Switch	15	Custom Fixture 5	165	2.48	Occ Sensor	1.01	3,200	2,800	4,206
36	65 West Greenbrook Road, North Caldwell, NJ 07006	1	123	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	115
37	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401	8	CFS20/1	20	0.16	Wall Switch	8	CFS20/1	20	0.16	Occ Sensor	0.00	3,200	2,800	64
<u> </u>	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401	4	CF140/3-BX	102	0.41	Wall Switch	4	CF140/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
40	65 West Greenbrook Road. North Caldwell, NJ 07006	1	403	4	CFT40/3-BX	102	0.01	Wall Switch	4	CFT40/3-BX	102	0.01	Occ Sensor	0.00	3.200	2,800	163
41	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401D	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
42	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401B	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
43	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401A	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
44	65 West Greenbrook Road, North Caldwell, NJ 07006	1	401E	3	F42LL CET40/2-BX	60 102	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	1/3
45	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402A	1	F43LL	93	0.01	Wall Switch	1	F43SSILL	72	0.07	Occ Sensor	0.00	3,200	2,800	96
47	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402	12	CFT40/3-BX	102	1.22	Wall Switch	12	CFT40/3-BX	102	1.22	Occ Sensor	0.00	3,200	2,800	490
48	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402B	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
49	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402C	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
50 51	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402D 402E	4	CFT40/3-BX	102	0.41	Wall Switch	4 2	CF140/3-BX	102	0.41		0.00	3,200	2,800	163
52	65 West Greenbrook Road. North Caldwell, NJ 07006	1	402E	4	CFT40/3-BX	102	0.31	Wall Switch	4	CFT40/3-BX	102	0.31	Occ Sensor	0.00	3,200	2,800	163
53	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402G	6	CFT40/3-BX	102	0.61	Wall Switch	6	CFT40/3-BX	102	0.61	Occ Sensor	0.00	3,200	2,800	245
54	65 West Greenbrook Road, North Caldwell, NJ 07006	1	402H	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.41	Occ Sensor	0.00	3,200	2,800	163
55	65 West Greenbrook Road, North Caldwell, NJ 07006	1	405	12	F42LL	60	0.72	Wall Switch	12	F42SSILL	48	0.58	Occ Sensor	0.14	3,200	2,800	691
56 57	65 West Greenbrook Road, North Caldwell, NJ 07006	1	404	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47	Ucc Sensor	0.11	3,200	2,800	533
58	65 West Greenbrook Road. North Caldwell, NJ 07006	1	407 406 WOMENS TR	<u>∠1</u> 5	F43LL	93	0.07	Wall Switch		F43SSILL	20 72	0.36	Occ Sensor	0.13	3,200	2,800	480
File 01 23954	What Feeny RSD HS FOME (Roy 1)			, v	· <b>-</b>						: 2			÷	0,200	,500	<u>-5/24/2012</u>

Worksheet: ECM-3 Lighting Rep&Controls

## **INSTRUCTIONS**

Use one line for each fixture type in a room or area.

7:38 AM

						PRE-INSTALLA	TION		POST-INS	STALLATION							
		_		Pre Fixt.		Pre Watts /	Pre kW /		Post Fixt	Post Fixt	Post Watts/	Post kW /		kW	Baseline Annual	Proposed Annual	Annual kWh
Line Item	Building	Floor	Area Description	NO.	Pre Fixt Code			Existing Control	NO.	Code			Proposed Control	Saved	Hours	Hours	(PreFixt
number	Building Address	is on	map	existina	Wattage Table	Wattage Table	Watts/Fixt) *	device	fixtures	Wattage Table	Wattage Table	Watts/Fixt) *		kW/Space -	annual	annual hours	#*PreWatts/Fixt *
				fixtures	5	5	(Pre Fixt		after retrofit	5	5	(Post Fixt		Post	hours for the	for the usage	(PostFixt#*PostW
							No.)					No.)		kW/Space	usage group	group	atts/Fixt *
																	r toposed riours)
59	65 West Greenbrook Road, North Caldwell, NJ 07006	1	408 CUST	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
60	65 West Greenbrook Road, North Caldwell, NJ 07006	1	409	5 18	F43LL F41LL	93	0.47	Wall Switch	5 18	F4355ILL F41SSILL	26	0.30	Occ Sensor	0.11	3,200	2,800	480 533
62	65 West Greenbrook Road, North Caldwell, NJ 07006	1	318	9	F43LL	93	0.84	Wall Switch	9	F43SSILL	72	0.65	Occ Sensor	0.19	3,200	2,800	864
63	65 West Greenbrook Road, North Caldwell, NJ 07006	1	312 WOMEN TR	3	F41LL	32	0.10	Wall Switch	3	F41SSILL	26	0.08	Occ Sensor	0.02	3,200	2,800	89
64	65 West Greenbrook Road, North Caldwell, NJ 07006	1	312 WOMEN TR	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
60 66	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313	10	F43LL F43LL	93	0.93	Wall Switch	10	F43SSILL F43SSILL	72	0.72	Occ Sensor	0.21	3,200	2,800	960
67	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313B	2	F43LL	93	0.19	Wall Switch	2	F43SSILL	72	0.14	Occ Sensor	0.04	3,200	2,800	192
68	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313C	6	F43LL	93	0.56	Wall Switch	6	F43SSILL	72	0.43	Occ Sensor	0.13	3,200	2,800	576
69	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313E	2	F43LL	93	0.19	Wall Switch	2	F43SSILL	72	0.14	Occ Sensor	0.04	3,200	2,800	192
70	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313F	4	F43LL F43LL	93	0.37	Wall Switch Wall Switch	4	F43SSILL F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
71	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313H STORAGE	3	F41LL	32	0.04	Wall Switch	3	F41SSILL	26	0.03	Occ Sensor	0.13	3,200	2,800	89
73	65 West Greenbrook Road, North Caldwell, NJ 07006	1	313 I STORAGE	1	F43LL	93	0.09	Wall Switch	1	F43SSILL	72	0.07	Occ Sensor	0.02	3,200	2,800	96
74	65 West Greenbrook Road, North Caldwell, NJ 07006	1	SALAMONE LAB	23	F43LL	93	2.14	Wall Switch	23	F43SSILL	72	1.66	Occ Sensor	0.48	3,200	2,800	2,208
75	65 West Greenbrook Road, North Caldwell, NJ 07006	1	314 MEN TR	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	0.22	Occ Sensor	0.06	3,200	2,800	288
70	65 West Greenbrook Road, North Caldwell, NJ 07006	1	314 MENTR	9	F43LL F44LL	118	1.06	Wall Switch	9	F43SSILL F43SSILL	72	0.65	Occ Sensor	0.02	3,200	2,800	1.584
78	65 West Greenbrook Road, North Caldwell, NJ 07006	1	309	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	0.29	Occ Sensor	0.07	3,200	2,800	346
79	65 West Greenbrook Road, North Caldwell, NJ 07006	1	307	9	F44LL	118	1.06	Wall Switch	9	F44SSILL	96	0.86	Occ Sensor	0.20	3,200	2,800	979
80	65 West Greenbrook Road, North Caldwell, NJ 07006	1	305	9	F44LL	118	1.06	Wall Switch	9	F44SSILL	96	0.86	Occ Sensor	0.20	3,200	2,800	979
82	65 West Greenbrook Road, North Caldwell, NJ 07006	1	304	9	F44LL F44LL	118	1.06	Wall Switch	9	F44SSILL F44SSILL	90	0.86	Occ Sensor	0.20	3,200	2,800	979
83	65 West Greenbrook Road, North Caldwell, NJ 07006	1	303	12	F44LL	118	1.42	Wall Switch	12	F44SSILL	96	1.15	Occ Sensor	0.26	3,200	2,800	1,306
84	65 West Greenbrook Road, North Caldwell, NJ 07006	1	302	12	F44LL	118	1.42	Wall Switch	12	F44SSILL	96	1.15	Occ Sensor	0.26	3,200	2,800	1,306
85	65 West Greenbrook Road, North Caldwell, NJ 07006	1	301	9	F44LL	118	1.06	Wall Switch	9	F44SSILL	96	0.86	Occ Sensor	0.20	3,200	2,800	979
87	65 West Greenbrook Road, North Caldwell, NJ 07006	1	213A	9	CFS20/1	20	0.12	Wall Switch	9	CFS20/1	96	0.00	Occ Sensor	0.20	3,200	2,800	979
88	65 West Greenbrook Road, North Caldwell, NJ 07006	1	217	15	F42LL	60	0.90	Occ Sensor	15	F42SSILL	48	0.72	Occ Sensor	0.18	3,200	2,800	864
89	65 West Greenbrook Road, North Caldwell, NJ 07006	1	215	15	F42LL	60	0.90	Occ Sensor	15	F42SSILL	48	0.72	Occ Sensor	0.18	3,200	2,800	864
90	65 West Greenbrook Road, North Caldwell, NJ 07006	1	211	32	F42LL	60	1.92	Occ Sensor	32	F42SSILL	48	1.54	Occ Sensor	0.38	3,200	2,800	1,843
91	65 West Greenbrook Road, North Caldwell, NJ 07006	1	208	24	F42LL F43LL	93	0.74	Occ Sensor	24	F42SSILL F43SSILI	48	0.58	Occ Sensor	0.29	3,200	2,800	768
93	65 West Greenbrook Road, North Caldwell, NJ 07006	1	204	24	F42LL	60	1.44	Occ Sensor	24	F42SSILL	48	1.15	Occ Sensor	0.29	3,200	2,800	1,382
94	65 West Greenbrook Road, North Caldwell, NJ 07006	1	210 WOMEN TR	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	Occ Sensor	0.00	3,200	2,800	8
95	65 West Greenbrook Road, North Caldwell, NJ 07006	1	210 WOMEN TR	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	0.22	Occ Sensor	0.06	3,200	2,800	288
90	65 West Greenbrook Road, North Caldwell, NJ 07006	1	214 MEN TR 214 MEN TR	3	F43LL	93	0.02	Wall Switch	3	F43SSILL	20 72	0.02	Occ Sensor	0.00	3,200	2,800	288
98	65 West Greenbrook Road, North Caldwell, NJ 07006	1	207	24	F42LL	60	1.44	Occ Sensor	24	F42SSILL	48	1.15	Occ Sensor	0.29	3,200	2,800	1,382
99	65 West Greenbrook Road, North Caldwell, NJ 07006	1	209	4	F43LL	93	0.37	Wall Switch	4	F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
100	65 West Greenbrook Road, North Caldwell, NJ 07006	1	209A	4	F43LL	93	0.37	Wall Switch	4	F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
101	65 West Greenbrook Road, North Caldwell, NJ 07006	1	203 203A	4	F42LL F43LL	93	0.37	Wall Switch	4	F423SILL F43SSILL	40	0.29	Occ Sensor	0.29	3,200	2,800	384
103	65 West Greenbrook Road, North Caldwell, NJ 07006	1	203	4	F43LL	93	0.37	Wall Switch	4	F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
104	65 West Greenbrook Road, North Caldwell, NJ 07006	1	201	24	F42LL	60	1.44	Occ Sensor	24	F42SSILL	48	1.15	Occ Sensor	0.29	3,200	2,800	1,382
105	65 West Greenbrook Road, North Caldwell, NJ 07006	1	202	8 0	F42LL F42LL	60	0.48	Occ Sensor	8 0	F42SSILL F42SSILL	<u>48</u> ۸۹	0.38	Occ Sensor	0.10	3,200	2,800	461 519
107	65 West Greenbrook Road, North Caldwell, NJ 07006	1	VESTIBULE	2	F42LL	60	0.12	Occ Sensor	2	F42SSILL	48	0.43	Occ Sensor	0.02	3,200	2,800	115
108	65 West Greenbrook Road, North Caldwell, NJ 07006	1	503	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47	Occ Sensor	0.11	3,200	2,800	533
109	65 West Greenbrook Road, North Caldwell, NJ 07006	1	505	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	173
110	65 West Greenbrook Road, North Caldwell, NJ 07006	1	507	10 24	F42LL F42L1	60	0.60	Wall Switch	10 24	F42SSILL F42SSILL	48	0.48	Occ Sensor	0.12	3,200	2,800	5/6
112	65 West Greenbrook Road, North Caldwell, NJ 07006	2	502	4	F44LL	118	0.47	Wall Switch	4	F44SSILL	96	0.38	Occ Sensor	0.09	3,200	2,800	435
113	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	68	F42LL	60	4.08	Wall Switch	68	F42SSILL	48	3.26	Occ Sensor	0.82	3,200	2,800	3,917
114	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	30	CFS20/1	20	0.60	Wall Switch	30	CFS20/1	20	0.60	Occ Sensor	0.00	3,200	2,800	240
115 116	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A 510B	8	F43LL F43LI	93 01	0.74	Wall Switch	8	F4355ILL F4355ILI	/2 72	0.58	Occ Sensor	0.17	3,200	2,800	/68 192
117	65 West Greenbrook Road, North Caldwell, NJ 07006	2	<u>510A</u>	8	F43LL	93	0.74	Wall Switch	8	F43SSILL	72	0.58	Occ Sensor	0.17	3,200	2,800	768
118	65 West Greenbrook Road, North Caldwell, NJ 07006	2	510C	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	0.22	Occ Sensor	0.06	3,200	2,800	288
119	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512A	4	F43LL	93	0.37	Wall Switch	4	F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
120	65 West Greenbrook Road, North Caldwell, NJ 07006	2	512 511	12	F42LL F41I I	32	0.72	Wall Switch	12 24	F41SSILL	48	0.58	Occ Sensor	0.14	3,200	∠,800 2,800	691 710
122	65 West Greenbrook Road, North Caldwell, NJ 07006	2	514	36	F44LL	118	4.25	Wall Switch	36	F44SSILL	96	3.46	Occ Sensor	0.79	3,200	2,800	3,917
123	65 West Greenbrook Road, North Caldwell, NJ 07006	2	510D	8	F44LL	118	0.94	Wall Switch	8	F44SSILL	96	0.77	Occ Sensor	0.18	3,200	2,800	870
124	65 West Greenbrook Road, North Caldwell, NJ 07006	2	513	12	F44LL	118	1.42	Wall Switch	12	F44SSILL	96	1.15	Occ Sensor	0.26	3,200	2,800	1,306
125	65 West Greenbrook Road, North Caldwell, NJ 07006	2	515	12	F44LL	118	1.42	Wall Switch	9 12	F44SSILL	96	1.15	Occ Sensor	0.11	3,200	2,800	1,306
File ni 2305/	- WAST ESSAY RSD HS FLMS (Rev. 1)						age 2 of 5				_	•			· · ·	<i>i</i>	-5/24/2012

File: 01 23954 - West Essex RSD HS ECMs (Rev 1) Worksheet: ECM-3 Lighting Rep&Controls 5/24/2012 7:38 AM

						PRE-INSTALLA	TION		POST-INS	STALLATION							
	Duilding	Floor	Area Decorintian	Pre Fixt.	Dro Firt Codo	Pre Watts /	Pre kW /	Evicting Control	Post Fixt	Post Fixt	Post Watts/	Post kW /	Proposed Control	kW	Baseline Annual	Proposed Annual	Annual kWh
Line item	Building Building Addross	Floor	Area Description	NO.	Code from	FIXt Watte/Fixt from	Space	Existing Control	NO.	Code from	FIXT	Space (Poet	Proposed Control	Saved	Hours Evicting	Broposod	Savea (PreFixt
number	Building Address	is on	map	existing	Wattage Table	Wattage Table	Watts/Fixt) *	device	fixtures	Wattage Table	Wattage Table	Watts/Fixt) *		kW/Space -	annual	annual hours	#*PreWatts/Fixt *
indinio er				fixtures			(Pre Fixt		after retrofit			(Post Fixt		Post	hours for the	for the usage	Baseline Hrs) - I(PostFixt#*PostW
							No.)					No.)		kW/Space	usage group	group	atts/Fixt *
																	Proposed Hours)
																	1
127	65 West Greenbrook Road, North Caldwell, NJ 07006	2	614 TR	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	2 Occ Sensor	0.00	3,200	2,800	8
128	65 West Greenbrook Road, North Caldwell, NJ 07006	2	614 TR	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	173
129	65 West Greenbrook Road, North Caldwell, NJ 07006	2	610 CUSTODIAL	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	115
130	65 West Greenbrook Road, North Caldwell, NJ 07006	2	612 TR	1	CFS20/1	20	0.02	Wall Switch	1	CFS20/1	20	0.02	2 Occ Sensor	0.00	3,200	2,800	8
131	65 West Greenbrook Road, North Caldwell, NJ 07006	2	612 TR	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	173
132	65 West Greenbrook Road, North Caldwell, NJ 07006	2	608 TR	1	CFS20/1	20	0.02	Wall Switch	1		20	0.02	Occ Sensor	0.00	3,200	2,800	172
133	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606	15	F42LL F44LL	118	1 77	Wall Switch		F42SSILL	40	1 44	Occ Sensor	0.04	3,200	2,800	1632
135	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606	31	CFS20/1	20	0.62	Wall Switch	31	CFS20/1	20	0.62	2 Occ Sensor	0.00	3.200	2,800	248
136	65 West Greenbrook Road, North Caldwell, NJ 07006	2	600	15	F44LL	118	1.77	Wall Switch	15	F44SSILL	96	1.44	Occ Sensor	0.33	3,200	2,800	1,632
137	65 West Greenbrook Road, North Caldwell, NJ 07006	2	600	31	CFS20/1	20	0.62	Wall Switch	31	CFS20/1	20	0.62	2 Occ Sensor	0.00	3,200	2,800	248
138	65 West Greenbrook Road, North Caldwell, NJ 07006	2	606B	5	F41LL	32	0.16	Wall Switch	5	F41SSILL	26	0.13	3 Occ Sensor	0.03	3,200	2,800	148
139	65 West Greenbrook Road, North Caldwell, NJ 07006	2	618	7	CFT40/3-BX	102	0.71	Wall Switch	7	CFT40/3-BX	102	0.71	Occ Sensor	0.00	3,200	2,800	286
140	65 West Greenbrook Road, North Caldwell, NJ 07006	2	602	6	CFT40/3-BX	102	0.61	Wall Switch	6	CFT40/3-BX	102	0.61	Occ Sensor	0.00	3,200	2,800	245
141	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604	8	CF140/3-BX	102	0.82	Wall Switch	8	CF140/3-BX	102	0.82	Occ Sensor	0.00	3,200	2,800	326
142	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604A	9	CFT40/3-BX	102	0.92	Wall Switch	9	CFT40/3-BX	102	0.92	Occ Sensor	0.00	3,200	2,800	612
143	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604A	8	1100/1	102	0.80	Wall Switch	8	CF23/1	29	0.23	Occ Sensor	0.57	3,200	2,800	1.910
145	65 West Greenbrook Road, North Caldwell, NJ 07006	2	6041	2	1100/1	100	0.20	Wall Switch	2	CF23/1	29	0.06	6 Occ Sensor	0.14	3,200	2,800	478
146	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604K	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	115
147	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604F	1	l100/1	100	0.10	Wall Switch	1	CF23/1	29	0.03	3 Occ Sensor	0.07	3,200	2,800	239
148	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604C	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
149	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604D	2	1100/1	100	0.20	Wall Switch	2	CF23/1	29	0.06	Occ Sensor	0.14	3,200	2,800	478
150	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604B	/	F41LL	32	0.22	Wall Switch	1	F41SSILL	26	0.18	Occ Sensor	0.04	3,200	2,800	207
151	65 West Greenbrook Road, North Caldwell, NJ 07006	2	604E		FZ3LL FZ3LL	52	0.05	Wall Switch	2	FZ3ILL F42SSILI	47	0.05	Occ Sensor	0.01	3,200	2,800	30
152	65 West Greenbrook Road, North Caldwell, NJ 07006	1	6048 604H	1	F4311	93	0.09	Wall Switch	1	F43SSILL	72	0.10	Occ Sensor	0.02	3,200	2,800	96
154	65 West Greenbrook Road, North Caldwell, NJ 07006	1	604L	4	CFT40/3-BX	102	0.41	Wall Switch	4	CFT40/3-BX	102	0.01	Occ Sensor	0.00	3,200	2,800	163
155	65 West Greenbrook Road, North Caldwell, NJ 07006	1	604L	4	CFS20/1	20	0.08	Wall Switch	4	CFS20/1	20	0.08	Occ Sensor	0.00	3,200	2,800	32
156	65 West Greenbrook Road, North Caldwell, NJ 07006	1	606A	12	F43LL	93	1.12	Wall Switch	12	F43SSILL	72	0.86	Occ Sensor	0.25	3,200	2,800	1,152
157	65 West Greenbrook Road, North Caldwell, NJ 07006	1	620A	8	CFT40/3-BX	102	0.82	Wall Switch	8	CFT40/3-BX	102	0.82	2 Occ Sensor	0.00	3,200	2,800	326
158	65 West Greenbrook Road, North Caldwell, NJ 07006	1	620	12	CFT40/3-BX	102	1.22	Wall Switch	12	CFT40/3-BX	102	1.22	2 Occ Sensor	0.00	3,200	2,800	490
159	65 West Greenbrook Road, North Caldwell, NJ 07006	1	616	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	115
160	65 West Greenbrook Road, North Caldwell, NJ 07006	1	701	9	F41LL F42LL	32 60	0.29	Wall Switch	9	F415SILL F42SSILL	20	0.23	Occ Sensor	0.05	3,200	2,800	<u>∠00</u> 115
161	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702	7	F42LL	60	0.12	Wall Switch	7	F42SSILL	48	0.34	Occ Sensor	0.02	3,200	2,800	403
163	65 West Greenbrook Road, North Caldwell, NJ 07006	1	704A	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	115
164	65 West Greenbrook Road, North Caldwell, NJ 07006	1	704B	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	0.29	Occ Sensor	0.07	3,200	2,800	346
165	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702A	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	173
166	65 West Greenbrook Road, North Caldwell, NJ 07006	1	702B	3	F42LL	60	0.18	Occ Sensor	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	173
167	65 West Greenbrook Road, North Caldwell, NJ 07006	1	700B	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	115
168	65 West Greenbrook Road, North Caldwell, NJ 07006	1	700 ELEC I	1/	F42LL F42LL	60	0.06	Wall Switch	14	F425SILL	48	0.05	Occ Sensor	0.01	3,200	2,800	806
109	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622G	4	F42LL	60	0.84	Wall Switch	14	F42SSILL	40	0.07	Occ Sensor	0.17	3,200	2,800	230
171	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622D STORAGE	5	F42LL	60	0.30	Wall Switch	5	F42SSILL	48	0.24	Occ Sensor	0.06	3,200	2,800	288
172	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622F	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	173
173	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622J	10	F42LL	60	0.60	Wall Switch	10	F42SSILL	48	0.48	Occ Sensor	0.12	3,200	2,800	576
174	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622C	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
175	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622B	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	173
176	65 West Greenbrook Road, North Caldwell, NJ 07006	1	622A	3	F42LL	60	0.18	Wall Switch	3	F42SSILL	48	0.14	Occ Sensor	0.04	3,200	2,800	1/3
177	65 West Greenbrook Road, North Caldwell, NJ 07006	1	624	4	F42LL F41LL	32	0.30	Wall Switch	0	F42SSILL	40	0.28	Occ Sensor	0.07	3,200	2,800	118
179	65 West Greenbrook Road, North Caldwell, NJ 07006	1	626	2	F41LL	32	0.06	Wall Switch	2	F41SSILL	20	0.05	Occ Sensor	0.02	3.200	2,800	59
180	65 West Greenbrook Road, North Caldwell, NJ 07006	1	628	18	F41LL	32	0.58	Wall Switch	18	F41SSILL	26	0.47	Occ Sensor	0.11	3,200	2,800	533
181	65 West Greenbrook Road, North Caldwell, NJ 07006	1	630	12	F43LL	93	1.12	Wall Switch	12	F43SSILL	72	0.86	Occ Sensor	0.25	3,200	2,800	1,152
182	65 West Greenbrook Road, North Caldwell, NJ 07006	1	630A	1	F43LL	93	0.09	Wall Switch	1	F43SSILL	72	0.07	Occ Sensor	0.02	3,200	2,800	96
183	65 West Greenbrook Road, North Caldwell, NJ 07006	1	630	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
184	65 West Greenbrook Road, North Caldwell, NJ 07006		901	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	0.22	Ucc Sensor	0.06	3,200	2,800	288
185	05 West Greenbrook Road, North Caldwell, NJ 07006	1	901A	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05		0.01	3,200	2,800	58
100	65 West Greenbrook Road, North Caldwell, NJ 07006	1	634	10	F43LL F4111	93 93	1.40 0.02	Wall Switch	10	F4333ILL	12 26	1.08	Occ Sensor	0.32	3,200	2,000 2 800	1,440 २०
188	65 West Greenbrook Road. North Caldwell, NJ 07006	1	632	2	F43LL	<u> </u>	0.03	Wall Switch	2	F43SSILL	72	0.14	Occ Sensor	0.04	3.200	2,800	192
189	65 West Greenbrook Road, North Caldwell, NJ 07006	1	636	3	F43LL	93	0.28	Wall Switch	3	F43SSILL	72	0.22	2 Occ Sensor	0.06	3,200	2,800	288
190	65 West Greenbrook Road, North Caldwell, NJ 07006	1	930	30	MH400/1	458	13.74	Wall Switch	30	Custom Fixture 4	200	6.00	Occ Sensor	7.74	4,160	3,760	34,598
191	65 West Greenbrook Road, North Caldwell, NJ 07006	1	930	1	F42LL	60	0.06	Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
192	65 West Greenbrook Road, North Caldwell, NJ 07006	1	921	7	F41LL	32	0.22	Wall Switch	7	F41SSILL	26	0.18	Occ Sensor	0.04	3,200	2,800	207
193	65 West Greenbrook Road, North Caldwell, NJ 07006		931	2	F42LL	60	0.12	Wall Switch	2	F42SSILL	48	0.10	UCC Sensor	0.02	3,200	2,800	115
194	West Essex RSD HS ECMs (Rev i)	1	900	30	IVIH400/1	458	13.74	Wall Switch	30	pusion Fixture 4	200	6.00	Occ Sensor	1.14	4,160	3,760	34,598 <u>-5/24/2012</u>

Worksheet: ECM-3 Lighting Rep&Controls

7:38 AM

						PRE-INSTALLA	TION		POST-INS	STALLATION							
	Desilding	Flags	Area Deceritation	Pre Fixt.	Dro First Co do	Pre Watts /	Pre kW	/	Post Fixt	Post Fixt	Post Watts/	Post kW /	/	kW	Baseline Annual	Proposed Annual	Annual kWh
Line item	Building Address	FIOOr Floor fixture	Area Description	<b>NO.</b>	Code from	FIXI Watts/Fixt from		Pre-installation control	NO.	Code from	FIXI Watts/Fixt from	(Post	Proposed Control Post-installation control device	Saveo Pro	<b>HOUIS</b> Existing	Proposed	(PreFixt
number	Dullaring / dulless	is on	map	existing	Wattage Table	Wattage Table	Watts/Fixt)	) * device	fixtures	Wattage Table	Wattage Table	Watts/Fixt) '	*	kW/Space -	annual	annual hours	#*PreWatts/Fixt *
				fixtures			(Pre Fixt	Í	after retrofit			(Post Fixt		Post	hours for the	for the usage	(PostFixt#*PostW
							No.)					No.)		kW/Space	usage group	group	atts/Fixt * Proposed Hours)
(05					<b>E</b> (0) 1						10					0.000	
195	65 West Greenbrook Road, North Caldwell, NJ 07006	1	914	2	F42LL	60	0.1	12 Wall Switch	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	255
190	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916H	4	F41LL F42LL	60	0.2	24 Wall Switch	4	F42SSILL	48	0.19	Occ Sensor	0.07	3,200	2,800	230
198	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916G	2	F42LL	60	0.1	12 Wall Switch	2	F42SSILL	48	0.10	) Occ Sensor	0.02	3,200	2,800	115
199	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916l	3	F42LL	60	0.1	18 Wall Switch	3	F42SSILL	48	0.14	1 Occ Sensor	0.04	3,200	2,800	173
200	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916L	8	F42LL	60	0.4	48 Wall Switch	8	F42SSILL	48	0.38	3 Occ Sensor	0.10	3,200	2,800	461
201	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916L 916A	5	F41LL F41LL	32	0.1	16 Wall Switch	5	F41SSILL F41SSILL	26	0.13	S Occ Sensor	0.03	3,200	2,800	148
202	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916	32	F41LL	32	1.0	02 Wall Switch	32	F41SSILL	26	0.83	3 Occ Sensor	0.19	3,200	2,800	947
204	65 West Greenbrook Road, North Caldwell, NJ 07006	1	907	2	F42LL	60	0.1	12 Wall Switch	2	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	115
205	65 West Greenbrook Road, North Caldwell, NJ 07006	1	907	18	CFS20/1	20	0.3	36 Wall Switch	18	CFS20/1	20	0.36	Occ Sensor	0.00	3,200	2,800	144
206	65 West Greenbrook Road, North Caldwell, NJ 07006	1	911	3	F42LL	60	0.1	18 Wall Switch	3	F42SSILL	48	0.14	Ucc Sensor	0.04	3,200	2,800	173
207	65 West Greenbrook Road, North Caldwell, NJ 07006	1	910	30	F42LL F42LL	60	1.8	80 Wall Switch	30	F42SSILL F42SSILL	48	1.44	4 Occ Sensor	0.04	3,200	2,800	1.728
209	65 West Greenbrook Road, North Caldwell, NJ 07006	1	916	6	F42LL	60	0.3	36 Occ Sensor	6	F42SSILL	48	0.29	9 Occ Sensor	0.07	3,200	2,800	346
210	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904	30	F42LL	60	1.8	80 Wall Switch	30	F42SSILL	48	1.44	1 Occ Sensor	0.36	3,200	2,800	1,728
211	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904C	6	F42LL	60	0.3	36 Wall Switch	6	F42SSILL	48	0.29	Occ Sensor	0.07	3,200	2,800	346
212	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904B	2	CF140/3-BX	102	0.2	20 Wall Switch	2	CF140/3-BX	102	0.20	Occ Sensor	0.00	3,200	2,800	82
213	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922B	3	F42LL	60	0.2	18 Wall Switch	3	F42SSILL	48	0.20	4 Occ Sensor	0.00	3,200	2,800	173
215	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922C	1	F42LL	60	0.0	06 Wall Switch	1	F42SSILL	48	0.05	Occ Sensor	0.01	3,200	2,800	58
216	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922A	4	F43LL	93	0.3	37 Wall Switch	4	F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
217	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922F	6	F42LL	60	0.3	36 Wall Switch	6	F42SSILL	48	0.29	Occ Sensor	0.07	3,200	2,800	346
218	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922F	8 28	F41LL F41LL	32	0.2	26 Wall Switch	8 28	F41SSILL F41SSILL	20	0.2	3 Occ Sensor	0.05	3,200	2,800	829
219	65 West Greenbrook Road, North Caldwell, NJ 07006	1	922H	20	F42LL	60	0.0	12 Wall Switch	20	F42SSILL	48	0.10	Occ Sensor	0.02	3,200	2,800	115
221	65 West Greenbrook Road, North Caldwell, NJ 07006	1	817	3	F42LL	60	0.1	18 Wall Switch	3	F42SSILL	48	0.14	1 Occ Sensor	0.04	3,200	2,800	173
222	65 West Greenbrook Road, North Caldwell, NJ 07006	1	819	3	F42LL	60	0.1	18 Wall Switch	3	F42SSILL	48	0.14	4 Occ Sensor	0.04	3,200	2,800	173
223	65 West Greenbrook Road, North Caldwell, NJ 07006	1	805	12	F42LL F42LL	60 60	0.7	72 Wall Switch	12	F42SSILL	48	0.58	3 Occ Sensor	0.14	3,200	2,800	691
224	65 West Greenbrook Road, North Caldwell, NJ 07006	1	810	8	F42LL	60	0.4	48 Wall Switch	8	F42SSILL	48	0.30	3 Occ Sensor	0.14	3,200	2,800	461
226	65 West Greenbrook Road, North Caldwell, NJ 07006	1	807	12	F42LL	60	0.7	72 Wall Switch	12	F42SSILL	48	0.58	3 Occ Sensor	0.14	3,200	2,800	691
227	65 West Greenbrook Road, North Caldwell, NJ 07006	1	809	12	F42LL	60	0.7	72 Wall Switch	12	F42SSILL	48	0.58	B Occ Sensor	0.14	3,200	2,800	691
228	65 West Greenbrook Road, North Caldwell, NJ 07006	1	811	12	F42LL	60	0.7	72 Wall Switch	12	F42SSILL	48	0.58	3 Occ Sensor	0.14	3,200	2,800	691
229	65 West Greenbrook Road, North Caldwell, NJ 07006	1	815	12	F42LL F42LL	60	0.9	90 Wall Switch	12	F42SSILL F42SSILL	48	0.50	2 Occ Sensor	0.14	3,200	2,800	864
231	65 West Greenbrook Road, North Caldwell, NJ 07006	1	815A	4	F43LL	93	0.3	37 Wall Switch	4	F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
232	65 West Greenbrook Road, North Caldwell, NJ 07006	1	803A	4	F43LL	93	0.3	37 Wall Switch	4	F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
233	65 West Greenbrook Road, North Caldwell, NJ 07006	1	801A	4	F43LL	93	0.3	37 Wall Switch	4	F43SSILL	72	0.29	Occ Sensor	0.08	3,200	2,800	384
234	65 West Greenbrook Road, North Caldwell, NJ 07006	1	801	3 15	F4211	20	0.0	90 Wall Switch	ى 15	F42SSILI	20 48	0.00	2 Occ Sensor	0.00	3,200	2,800	864
236	65 West Greenbrook Road, North Caldwell, NJ 07006	1	803	3	CFS20/1	20	0.0	06 Wall Switch	3	CFS20/1	20	0.06	6 Occ Sensor	0.00	3,200	2,800	24
237	65 West Greenbrook Road, North Caldwell, NJ 07006	1	803	15	F42LL	60	0.9	90 Wall Switch	15	F42SSILL	48	0.72	2 Occ Sensor	0.18	3,200	2,800	864
238	65 West Greenbrook Road, North Caldwell, NJ 07006	1	731	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	Occ Sensor	0.11	3,200	2,800	533
239 240	65 West Greenbrook Road, North Caldwell, NJ 07006	1	730	18 18	F41LL F41LL	32	0.5	58 Wall Switch	18 18	F41SSILL	26 26	0.47	7 Occ Sensor	0.11	3,200	2,800 2 800	533
241	65 West Greenbrook Road, North Caldwell, NJ 07006	1	728	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
242	65 West Greenbrook Road, North Caldwell, NJ 07006	1	727	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
243	65 West Greenbrook Road, North Caldwell, NJ 07006	1	726	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
244	65 West Greenbrook Road, North Caldwell, NJ 07006	1	/25 700	18	F41LL F/111	32	0.5	DO UCC SENSOR	18	F41SSILL F41SSILL	26	0.47	Occ Sensor	0.11	3,200	2,800	533
245	65 West Greenbrook Road, North Caldwell, NJ 07006	1	718	4	F42LL	60	0.0	06 Occ Sensor	1	F42SSILL	48	0.05	5 Occ Sensor	0.02	3,200	2,800	58
247	65 West Greenbrook Road, North Caldwell, NJ 07006	1	720	1	CFS20/1	20	0.0	02 Wall Switch	1	CFS20/1	20	0.02	2 Occ Sensor	0.00	3,200	2,800	8
248	65 West Greenbrook Road, North Caldwell, NJ 07006	1	720	3	F43LL	93	0.2	28 Wall Switch	3	F43SSILL	72	0.22	2 Occ Sensor	0.06	3,200	2,800	288
249	65 West Greenbrook Road, North Caldwell, NJ 07006	1	716	1	CFS20/1	20	0.0	UZ Wall Switch	1		20		2 Occ Sensor	0.00	3,200	2,800	8 200
250	65 West Greenbrook Road. North Caldwell, NJ 07006	1	721	18	F41LL	32	0.2	58 Wall Switch	3 18	F41SSILL	26	0.22	7 Occ Sensor	0.00	3,200	2,800	<u>∠08</u> 533
252	65 West Greenbrook Road, North Caldwell, NJ 07006	1	723	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
253	65 West Greenbrook Road, North Caldwell, NJ 07006	1	719	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
254	65 West Greenbrook Road, North Caldwell, NJ 07006	1	717	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	Occ Sensor	0.11	3,200	2,800	533
255 256	65 West Greenbrook Road, North Caldwell, NJ 07006	1	713	18	F41LL F41LI	<u> </u>	0.5	58 Wall Switch	18	F41SSILL	20 26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
257	65 West Greenbrook Road, North Caldwell, NJ 07006	1	711	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
258	65 West Greenbrook Road, North Caldwell, NJ 07006	1	709	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
259	65 West Greenbrook Road, North Caldwell, NJ 07006	1	708	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	Occ Sensor	0.11	3,200	2,800	533
26U 261	65 West Greenbrook Road, North Caldwell, NJ 07006	1	707	18 18	F41LL F41LI	32	0.5	58 Wall Switch	18 18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800 2,800	533
262	65 West Greenbrook Road, North Caldwell, NJ 07006	1	705	18	F41LL	32	0.5	58 Wall Switch	18	F41SSILL	26	0.47	7 Occ Sensor	0.11	3,200	2,800	533
																	5/2/1/2019

File: 01 23954 - West Essex RSD HS ECMs (Rev. 1) Worksheet: ECM-3 Lighting Rep&Controls 5/24/2012 7:38 AM

						PRE-INSTALLA	TION		POST-IN	STALLATION				]			
				Pre											Baseline	Proposed	Annual
				Fixt.		Pre Watts /	Pre kW /		Post Fixt	Post Fixt	Post Watts/	Post kW /		kW	Annual	Annual	kWh
Line Item	Building	Floor	Area Description	No.	Pre Fixt Code	Fixt	Space	Existing Control	No.	Code	Fixt	Space	Proposed Control	Saved	Hours	Hours	Saved
Integer line	Building Address	Floor fixture	Description of location that matches site	# of	Code from	Watts/Fixt from	(Pre	Pre-installation contro	Number of	Code from	Watts/Fixt from	(Post	Post-installation control device	Pre	Existing	Proposed	(PreFixt
number		is on	map	existing	Wattage Table	Wattage Table	Watts/Fixt) *	device	fixtures	Wattage Table	Wattage Table	Watts/Fixt) *		kW/Space	annual	annual hours	#*PreWatts/Fixt *
				fixtures	-		(Pre Fixt		after retrofit	_	_	(Post Fixt		Post	hours for the	for the usage	(PostFixt#*PostW
							No.)					No.)		kW/Space	usage group	group	atts/Fixt *
																	1
263	65 West Greenbrook Road, North Caldwell, NJ 07006	1	701	9	F41LL	32	0.29	Wall Switch	9	F41SSILL	26	6 0.23	Occ Sensor	0.05	3,200	2,800	266
264	65 West Greenbrook Road, North Caldwell, NJ 07006	1	700	1	F43LL	93	0.09	Wall Switch	1	F43SSILL	72	2 0.07	Occ Sensor	0.02	3,200	2,800	96
265	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	109	FU2LL	60	6.54	Wall Switch	109	FU2ILL	59	9 6.43	Occ Sensor	0.11	3,200	2,800	2,921
266	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	72	F42LL	60	4.32	Wall Switch	72	F42SSILL	48	3 3.46	Occ Sensor	0.86	3,200	2,800	4,147
267	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	2	F43LL	93	0.19	Wall Switch	2	F43SSILL	72	2 0.14	Occ Sensor	0.04	3,200	2,800	192
268	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	13	CFS20/1	20	0.26	Wall Switch	13	CFS20/1	20	0.26	Occ Sensor	0.00	3,200	2,800	104
269	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	24	F44LL	118	2.83	Wall Switch	24	F44SSILL	96	6 2.30	Occ Sensor	0.53	3,200	2,800	2,611
270	65 West Greenbrook Road, North Caldwell, NJ 07006	1	CORRIDOR	24	F44LL	118	2.83	Wall Switch	24	F44SSILL	96	6 2.30	Occ Sensor	0.53	3,200	2,800	2,611
271	65 West Greenbrook Road, North Caldwell, NJ 07006	1	906	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	3 0.29	Occ Sensor	0.07	3,200	2,800	346
272	2 65 West Greenbrook Road, North Caldwell, NJ 07006	1	908	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	3 0.29	Occ Sensor	0.07	3,200	2,800	346
273	65 West Greenbrook Road, North Caldwell, NJ 07006	1	904A	4	F42LL	60	0.24	Wall Switch	4	F42SSILL	48	3 0.19	Occ Sensor	0.05	3,200	2,800	230
274	65 West Greenbrook Road, North Caldwell, NJ 07006	1	909	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	3 0.29	Occ Sensor	0.07	3,200	2,800	346
275	65 West Greenbrook Road, North Caldwell, NJ 07006	1	924	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	3 0.29	Occ Sensor	0.07	3,200	2,800	346
276	65 West Greenbrook Road, North Caldwell, NJ 07006	1	926	8	F42LL	60	0.48	Wall Switch	8	F42SSILL	48	3 0.38	Occ Sensor	0.10	3,200	2,800	461
277	65 West Greenbrook Road, North Caldwell, NJ 07006	1	928	6	F42LL	60	0.36	Wall Switch	6	F42SSILL	48	3 0.29	Occ Sensor	0.07	3,200	2,800	346
278	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1000	20	F42LL	60	1.20	Wall Switch	20	F42SSILL	48	3 0.96	Occ Sensor	0.24	3,200	2,800	1,152
279	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1000A	5	F42LL	60	0.30	Wall Switch	5	F42SSILL	48	3 0.24	Occ Sensor	0.06	3,200	2,800	288
280	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1001, CLOSET & BATHROOM	20	F42LL	60	1.20	Wall Switch	20	F42SSILL	48	3 0.96	Occ Sensor	0.24	3,200	2,800	1,152
281	65 West Greenbrook Road, North Caldwell, NJ 07006	1	1002A	4	F42LL	60	0.24	Wall Switch	4	F42SSILL	48	3 0.19	Occ Sensor	0.05	3,200	2,800	230
282	2 65 West Greenbrook Road, North Caldwell, NJ 07006	1	1002	18	F42LL	60	1.08	Wall Switch	18	F42SSILL	48	3 0.86	Occ Sensor	0.22	3,200	2,800	1,037
283	65 West Greenbrook Road, North Caldwell, NJ 07006	1	EXTERIOR	50	MH400/1	458	3 22.90	Light Sensors	50	MH400/1	458	3 22.90	Light Sensor & Timer	0.00	4,368	2,184	50,014
																	·
				2,274													
					50												·
				92										1			
																	1
						Total Pre kW	231.76	Total Post Fixt	2,896.00		Total Post kW	174.98	Total kW Saved	56.78	Total Annua	I kWh Saved	307,404.40

## West Essex Regional School District CHA Project #23985

### West Essex High School

## Cost Table

	Material Cost (\$/fixture)	Labor Cost (\$/fixture)	Disposal Cost (\$/fixture)	Retrofit Cost (\$/fixture)	Quantity	Total Cost
Single fixture retrofit						
New electronic ballast installation	\$42	\$42	\$0	\$84	2408	
New Super T8 lamp installation	\$2	\$4	\$0	\$6 <b>\$90</b>	2408	
Troffer lighting retrofit						
New electronic ballast installation	\$42	\$42	\$0	\$84	2408	\$202.272
New super T8 lamp installation	\$24	\$8	\$0	\$32	2408	\$78.019
sub-total	<b>*</b>			\$116		<i></i>
Photo cell installation	\$98	\$53	\$0	\$150		
	·	·	·	\$150		\$280,291
Auditorium PAR 38 Q250 recessed can downlight retrofit						
New LED lamp installation	\$55	\$20	\$0	\$75	49	\$3,675
sub-total				\$75		
Incandescent lighting retrofit						
Existing incandescent bulb removal	\$0	\$0	\$4	\$4	15	\$63
New compact fluorescent installation	\$32	\$4	\$0	\$36	15	\$536
				\$40		
Motion sensor installation	\$100	\$85	\$0	\$185	450	\$83,250
Additonal wiring for few permanent lights	\$47	\$26	\$0	\$74		
				\$259		

#### ECM-4: HVAC Condensing Boiler Addition

#### **ECM Description Summary**

One (1) high efficiency condensing boiler will be added to operate as the primary boiler during the milder winter months (October-November and March-April) with the existing two boilers operating as secondary boilers. Boiler installation location/space to be determined since there is not enough room in the existing boiler room. Space will have to be provided in existing building or constructed.

Existing Fuel	Nat.Gas	-
Proposed Fuel	Nat.Gas	•

Item	<u>Value</u>	<u>Units</u>	Formula/Comments
Baseline Fuel Cost	\$ 1.08	/ Therm	
Proposed Fuel Cost	\$ 1.08	/ Therm	
Baseline Fuel Use	51,500	Therms	Based on historical utility data.
Existing Boiler Plant Efficiency	80%		Estimated or Measured
Baseline Boiler Load	4,120,000	Mbtu/yr	Baseline Fuel Use x Existing Efficiency x 100 Mbtu/Therms
Baseline Fuel Cost	\$ 55,620		
Proposed Boiler Plant Efficiency	92%		New Condensing Boiler Efficiency
Proposed Fuel Use	44,783	Therms	Baseline Boiler Load / Proposed Efficiency / 100 Mbtu/Therms
Proposed Fuel Cost	\$ 48,365		
Annual Utility Savings	6,717	Therms	
Annual Savings	\$ 7,255		
Boiler Addition Project Cost	\$ 120,279		
Simple Payback	17	Years	

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

West Essex Regional School District		
CHA Project #23985	Multipliers	
High School Building	Material:	1.10
	Labor:	1.35
ECM-12: Replace Electric Kitchen Equipment with Natural	Gas Equir quipment:	1.10

Description	ΟΤΛ		L	JNIT COST	S	SUE	STOTAL CO	STS	Т	OTAL	DEMARKS
Description	QTT	UNIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	C	COST	REMARKS
						\$-	\$-	\$-	\$	-	
3,000 MBH NG Condensing Boiler	1	EA	\$ 45,000	\$ 500		\$ 49,500	\$ 675	\$-	\$	50,175	
Flue Installation	25	LF	\$ 7.5	\$ 6.50		\$ 206	\$ 219	\$-	\$	426	
Reprogram DDC system	1	EA	\$ 100.0	\$ 350.00		\$ 110	\$ 473	\$-	\$	583	
Miscellaneous Electrical	1	LS	\$ 500	\$ 250		\$ 550	\$ 338	\$-	\$	888	
Miscellaneous HW Piping	1	LS	\$ 2,000	\$ 1,000		\$ 2,200	\$ 1,350	\$-	\$	3,550	
Boiler room/space construction	1	LS	\$ 20,000	\$ 10,000		\$ 22,000	\$ 13,500	\$-	\$	35,500	
						\$-	\$-	\$ -	\$	-	

\$ 91,121	Subtotal
\$ 9,112.06	10% Contingency
\$20,046.54	20% Contractor O&P
\$-	0% Engineering
\$ 120,279	Total

### ECM-5: HVAC Hot Water System Control Temperature Reset

Notes:

- 1. Building heat is proposed to be provided by one condensing gas-fired hot water boiler.
- 2. Boiler currently does not have hot water reset control, boiler water temprature remains constant throughout the year.
- 3. Recommend installation of condensing boiler and controls to allow for automatic boiler water reset based on OA temperature.
- 4. This measure has been interracted with the 'Boiler Replacement' measure.

#### BOILER WATER TEMPERATURE RESET:

- 88.0% ...BOILER COMBUSTION EFFICIENCY (OLDEFF)
- 5.0% ... BOILER/PIPING RADIANT& MISC. HEAT LOSSES (OLDLOSS)
  - 80 ... AMBIENT ROOM TEMPERATURE (AMBTEMP)
- 180 ...CURRENT BOILER TEMPERATURE (OLDTEMP)
- 160 ...NEW BOILER TEMPERATURE (NEWTEMP)
- 20 ...AVERAGE REDUCTION IN BOILER TEMP (AVGRED) = (OLDTEMP-NEWTEMP)
- 0.50% ...REDUCTION IN COMBUSTION LOSSES BY RESET (COMBRED) = AVGRED/40/100
- 1.00% ...REDUCTION IN RADIANT LOSSES (RADRED)=(OLDLOSS-(OLDLOSS\*(NEWTEMP-AMBTEMP)/(OLDTEMP-AMBTEMP)))
- 1.50% ...NET IMPROVEMENT IN BOILER FUEL-TO-HEAT EFFICIENCY (NETEFF) = COMBRED+RADRED
- THERMS ... TYPE OF FUEL (GAS MCF, OIL GAL, COAL TONS)
- 1.08 ... COST / UNIT OF FUEL

\$

- 2,500,000 ... BTUs / UNIT (BTUs/UNIT)
  - 125,083 ... ANNUAL TOTAL FUEL CONSUMPTION FROM BILLS (TOTFUEL)
  - 0.00 ... ESTIMATED NON-BOILER FUEL CONSUMPTION (OTHFUEL)
  - 125,083 ...ANNUAL BOILER FUEL CONSUMPTION (HEATFUEL) = TOTFUEL-OTHFUEL
  - 83.0% ...CURRENT BOILER FUEL-TO-HEAT EFFICIENCY (CEFF) = OLDEFF-OLDLOSS
  - 84.5% ...RETROFIT BOILER FUEL-TO-HEAT EFFICIENCY (REFF) = CEFF+NETEFF
- 2,220.41 ...CALCULATED ANNUAL FUEL SAVINGS (FUELSAVE) = ANNFUEL (ANNFUEL\*CEFF/REFF)

2,220 THERMS SAVINGS \$2,398 COST SAVINGS \$10,982 4.6 YEARS West Essex Regional School District

CHA Project #23985

High School Building

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-5: HVAC Water Systems Control Temperature Reset - Cost

Description	ΟΤΛ			UNIT COSTS			S	SUBTOTAL COSTS					TOTAL	DEMARKS
Description	QIT	UNIT	M	IAT.	L	ABOR	EQUIP.		MAT.	L	ABOR	EQUIP.	COST	REIMARKS
								\$	-	\$	-	\$-	\$ -	
Hot water temperature sensor/transmitter	2	ea	\$	350	\$	150	\$-	\$	770	\$	405	\$-	\$ 1,175	
Chilled water temperature sensor/transmitter	2	ea	\$	350	\$	150	\$-	\$	770	\$	405	\$-	\$ 1,175	
Reprogram DDC system	2	ea	\$	100	\$	350	\$-	\$	220	\$	945	\$-	\$ 1,165	per temperature program
Miscellaneous Electrical	2	LS	\$	150	\$	250	\$-	\$	330	\$	675	\$-	\$ 1,005	
Miscellaneous HW Piping	2	LS	\$	500	\$	1,000	\$-	\$	1,100	\$	2,700	\$-	\$ 3,800	
								\$	-	\$	-	\$-	\$ -	

\$ 8,320	Subtotal
\$ 832.00	10% Contingency
\$ 1,830.40	20% Contractor O&P
\$ -	0% Engineering
\$ 10,982	Total

### ECM-6: HVAC Chilled Water System Glycol Replacement

### ECM Description Summary

The % concentration glycol solution currently used in the chilled water systemonly provides freeze protection down to 10°F. After the chiller plant is turned off for the year, the chilled water pumps continue to operate during the heating season to circulate the system fluid ito prevent freezing and pipe burst. It is recommended the glycol solution be replaced with the proper % glycol concentration to provide adequate freeze protection. Shutting down the chilled water pumps during the heating season will prevent unnecessary motor electric power consumption.

Item	<u>Value</u>	<u>Units</u>	Formula/Comments
Baseline Electric Cost	\$ 0.135	/ kWh	
Existing Chilled Water System Pumps Motor HP	50.0	HP	Based on equipment nameplate data.
Existing Pump Motor Hours of Operation	8,760	hours	Current system operates 24/7 in occupied mode.
Existing Pump Motor Electrical usage	261,293	kWh	
Existing Pump Motor Electrical Cost	\$ 35,275		
Proposed Pump Motor Hours of Operation	3,360	hours	Pump motor will be turned off for 6 months, October thru April.
Proposed Pump Motor Electrical usage	100,222	kWh	
Proposed Pump Motor Electrical Cost	\$ 13,530		
Annual Electrical Utility Savings	161,071	kWh	
Annual Electrical Cost Savings	\$ 21,745		
Chilled water system glycol fluid replacment cost	\$ 83,589		
Simple Payback	4	years	

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

Multipliers		
	Material:	1.10
	Labor:	1.35
	Equipment:	1.10

ECM-6: HVAC Chilled Water System Glycol Replacement - Cost

Description	ΟΤΥ		l	JNIT COSTS		SUB	TOTAL CO	STS	TOTAL COST	DEMARKS	
Description		UNIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	TOTAL COST	REWARKS	
						\$-	\$-	\$-	\$-		
Existing System Fluid Removal	1	LS	\$ 500	\$ 2,000		\$ 550	\$ 2,700	\$-	\$ 3,250		
New System Fluid, 30% Propylene Glycol	1	LS	\$ 54,000.0	\$ 500.00		\$ 59,400	\$ 675	\$-	\$ 60,075	4,500 gallons at \$12 per gallon	
						\$-	\$-	\$-	\$-		

\$ 63,325	Subtotal
\$ 6,332.50	10% Contingency
\$ 13,931.50	20% Contractor O&P
\$ -	0% Engineering
\$ 83,589	Total

#### ECM-7: Electric Duct Heating Coil Replacement

#### **ECM Description Summary**

Electric heating coils mounted in the supply ductwork provide temperature control for each zone in the majority of the high school building areas served by the Trane T-Series Packaged rooftop air handling units, including the Auditorium, Kitchen, Cafeteria, 900 Block Gyms/Lockers Rooms/weight room, Media Center (Library), Main Offices and School District Administration Offices. In addition to the duct mounted electric heating coils in the 700 Block offices, electric baseboard radiators provide heating. The electric resistive heat equipment consumes electrical energy; the boiler plant can produce the heating capacity needed using boilers and less costly natural gas.

Existing Fuel	Electric	•
Proposed Fuel	Nat.Gas	•

Item	<u>Value</u>	<u>Units</u>	Formula/Comments
Baseline Electric Utility Cost	\$ 0.14	/ kWh	
Proposed Fuel Cost	\$ 1.08	/ Therm	
Existing Electric Duct Coils Connected Load	182	kW	Based on scheduled equipment data
Annual Hours of Operation	4,368	hours	
Existing Electric Duct Coil Electric Usage	794,976	kWh	Baseline Fuel Use x Existing Efficiency x 3.413 Mbtu/kWh
Baseline Electric Cost	\$ 107,322	/year	
Hot Water System Plant Efficiency	80%		
Hot Water Heating Coil Gas Usage	33,916	Therms	
Proposed Fuel Cost	\$ 36,629		
Annual Electric Utility Savings	794,976	kWh	
Annual Cost Savings	\$ 70,693		
Electric Duct Heating Coil Replacment Cost	\$ 131,333		
Simple Payback	2	years	

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

Mult	ipliers	
	Material:	1.10
	Labor:	1.35
nont -	CostEquipment:	1 10

ECM-12: Replace Electric Kitchen Equipment with Natural Gas Equipment - Cost Equipment: 1.10

Description	ΟΤΥ		UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	DEMARKS	
Description	QTT	UNIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	TOTAL COST	REMARKS	
						\$-	\$-	\$-	\$-		
Electric Duct Coils and Electrical Demolition	36	EA	\$ 75	\$ 100		\$ 2,970	\$ 4,860	\$-	\$ 7,830		
Hot Water Coils Cost & Installation	36	EA	\$ 750.0	\$ 75.00		\$ 29,700	\$ 3,645	\$-	\$ 33,345	Based on 2012 Means	
Hot Water Valves & Piping Installation	36	EA	\$ 500	\$ 250		\$ 19,800	\$ 12,150	\$-	\$ 31,950		
Reprogram DDC system	36	LS	\$ 75	\$ 150		\$ 2,970	\$ 7,290	\$-	\$ 10,260		
Miscellaneous Electrical Wiring for Controls	36	EA	\$ 100	\$ 250		\$ 3,960	\$ 12,150	\$-	\$ 16,110		
						\$-	\$-	\$-	\$-		

\$ 99,495	Subtotal
\$ 9,949.50	10% Contingency
\$ 21,888.90	20% Contractor O&P
\$ -	0% Engineering
\$ 131,333	Total

### ECM-8: Install Variable Speed Drives - HW Pump

## Variable Inputs

Blended Electric Rate	\$0.14	
Heating System "On" Point	55	
VFD Efficiency	98.5%	

### ECM Description Summary

Hot Water Pumps P#1,#2,#3 provide heating hot water to the high school building. These pumps currently operate in lead/lag fashion with a third pump for standby; only one pump operates at a time but all three pump motors will be replaced. The hot water coils on the air handlers and other hydronic heating equipment served by these pumps are equipped with 2-way control valves. The intent is to install a two VFDs (for redundancy) with bypass and selector switch to control the three pumps based on pressure. New motors will have to be installed since the existing motors do not have adequate insulation to handle a VFD retrofit.

PUMP SCHEDULE										
Pump ID	Qty	HP	Total HP	Existing Motor Motor Eff.	New Motor Motor Eff.	Exist. Motor kW Note 1	New Motor kW Note 2			
P#1,#2,#3	1	20.0	20.0	86.5%	93.6%	13.80	12.75			
			0.0			0.00	0.00			
					Total:	13.80	12.75			

	SAVINGS ANALYSIS									
OAT - DB	OAT - WB	Annual	Heating	Pump	Existing	Proposed	Speed	Proposed	Proposed	
Avg	Avg	Hours in	Hours	Load	Pump	Pump	efficiency	Pump	Savings	
Temp F	Temp F	Bin	Bin	%	kWh	kW	%	kWh	kWh	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	
			=IF(A>TP,0,C)	=0.5+0.5*	=D*AA	=BB*E^2.5/CC		=D*G	=F-H	
				(50-A)/(50-10))						
See Note 3	See Note 3	See Note 3		See Note 4		See Note 5				
07.5		<u> </u>		00/	<u> </u>		0.00/	0	0	
97.5	75	3	0	0%	0	0.0	0.0%	0	0	
92.5	74	34	0	0%	0	0.0	0.0%	0	0	
87.5	72	131	0	0%	0	0.0	0.0%	0	0	
82.5	69	500	0	0%	0	0.0	0.0%	0	0	
77.5	67	620	0	0%	0	0.0	0.0%	0	0	
72.5	64	664	0	0%	0	0.0	0.0%	0	0	
67.5	62	854	0	0%	0	0.0	0.0%	0	0	
62.5	58	927	0	0%	0	0.0	0.0%	0	0	
57.5	53	600	0	0%	0	0.0	0.0%	0	0	
52.5	47	610	610	53%	8,417	2.6	84.1%	1,900	6,518	
47.5	43	611	611	58%	8,431	3.4	88.8%	2,314	6,117	
42.5	38	656	656	64%	9,052	4.2	92.7%	2,988	6,064	
37.5	34	1,023	1,023	69%	14,116	5.2	95.9%	5,552	8,564	
32.5	30	734	734	75%	10,128	6.3	98.2%	4,714	5,414	
27.5	25	334	334	81%	4,609	7.5	99.8%	2,525	2,084	
22.5	20	252	252	86%	3,477	8.9	100.0%	2,245	1,232	
17.5	16	125	125	92%	1,725	10.4	100.0%	1,302	423	
12.5	11	47	47	97%	649	12.1	99.7%	569	80	
7.5	6	22	22	100%	304	12.9	99.0%	288	16	
2.5	2	13	13	100%	179	12.9	99.0%	170	9	
-2.5	-3	0	0	0%	0	0.0	0.0%	0	0	
-7.5	-8	0	0	0%	0	0.0	0.0%	0	0	
		8,760	4,427		61,087			24,566	36,521	

Notes:

1) Existing motor power based on operation with existing motor efficiency, operating at 80% load factor when at full load. Formula: Motor HP x 0.746 x 0.8 / Exist. Motor Eff.,

New motor power is based on same formula using the new motor efficiency.

2) New motor power is the same as existing motor power adjusted for the new efficiency, if a new motor is proposed.

3) Weather data from NOAA for Newark, New Jersey.

4) The pump load is estimated at 100% at X deg. OAT and 50% at X deg. OAT and varies linearly in between.

5) The required VFD motor draw is based on a 2.5 power relationship to load.

Annual Utility Savings	36,521	kWh
Annual Savings	\$ 4,930	
Install Variable Speed Drives	\$ 33,485	
- HW Pump Cost		
Simple Payback	7	Years
West Essex Regional School District		
---	-------------	------
CHA Project #23985	Multipliers	
High School Building	Material:	1.10
	Labor:	1.35
ECM-8: Install Variable Speed Drives - HW Pump - Cost	Equipment:	1.10

Description	ΟΤΥ			UNIT COSTS	S	SUB	TOTAL CO	STS	TOTAL COST	DEMARKS
Description	QII	UNIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	TOTAL COST	REMARKS
						\$-	\$-	\$-	\$-	
20 HP VFD	3	ea	\$ 3,465	\$ 772		\$ 11,435	\$ 3,126	\$-	\$ 14,560	
20 HP Motors	3	ea	\$ 1,500	\$ 200		\$ 4,950	\$ 810	\$-	\$ 5,760	
Reprogram DDC system	3	ea	\$ 100	\$ 350		\$ 330	\$ 1,418	\$-	\$ 1,748	
Electrical - misc.	3	ls	\$ 200	\$ 150		\$ 660	\$ 608	\$-	\$ 1,268	
Pipe pressure sensor/transmitter	1	ea	\$ 850	\$ 500		\$ 935	\$ 675	\$-	\$ 1,610	
Misc. piping modification	1	ea	\$ 200	\$ 150		\$ 220	\$ 203	\$-	\$ 423	
						\$-	\$-	\$-	\$ -	

\$ 25,368	Subtotal
\$ 2,537	10% Contingency
\$ 5,581	20% Contractor O&P
\$ -	0% Engineering
\$ 33,485	Total

## ECM-8B: Install Variable Speed Drives - AHU Fans

\$0.14

Blended Electric Rate	

AIR HANDLER	AREA SERVED	FAN MOTOR HP			
AHU-1	Auditorium	3.0			
AHU-2	Auditorium	3.0			
AHU-19	Library	7.5			
AHU-20	Library	5.0			
AHU-22	Offices	7.5			
AHU-23	Offices	7.5			
AHU-24	Offices	5.0			
Total Combined M	38.5				

## ECM Description Summary

Air handling units with constant volume supply fan motors serve the Auditorium (AHU-1,2), Library (AHU-19,20) and Offices (AHU-22,23,24); these are spaces with intermittent large occupancy loads. By adding Variable Frequency Drives (VFD's) to reducing the air flow by slowing the motors down, significant electrical energy can be saved. The fan motors will also be replaced with a premium efficiency motor. System static pressure will be permitted to float with fan speed, and pressure will not be controlled or monitored. Control strategy is to program the EMCS system to permit the AHU fan to ramp speed linearly between 100% and 50% as OAT varies between the design heating load and building balance point

UNIT	HP	Existing Motor Eff (Note 1)	New Motor Eff (Note 1)	Existing Motor kW	New Motor	kW		Building Balance Point
Combined Motor Horsepower	38.5	84.0%	93.0%	27.35	24.71			55.0
				27.35	24.71		VFD Eff. (CC)	98.5%

OAT - DB		Occupied	AHU	Existing	Existing	Fan	Proposed	Speed	Proposed	Savings
Avg	Bin Hours	Hours in	Hours in	Fan	Fan	Load	Fan	efficiency	Fan	Fan
Temp F		Bin	Bin	Kw	kWh	%	kW	%	kWh	kWh
(A)	(B)	(C )	(D)	(F)	(F)	(E)	(G)	(H)	(I)	(J)
100 5										
102.5	0	0	0	27.4	0	50%	3.14	81.5%	0	0
97.5	3	2	2	27.4	43	50%	3.14	81.5%	6	37
92.5	34	18	18	27.4	487	50%	3.14	81.5%	69	419
87.5	131	69	69	27.4	1,877	50%	3.14	81.5%	264	1,613
82.5	500	262	262	27.4	7,164	50%	3.14	81.5%	1008	6,156
77.5	620	325	325	27.4	8,883	50%	3.14	81.5%	1249	7,634
72.5	664	348	348	27.4	9,514	50%	3.14	81.5%	1338	8,176
67.5	854	447	447	27.4	12,236	50%	3.14	81.5%	1721	10,515
62.5	927	486	486	27.4	13,282	50%	3.14	81.5%	1868	11,414
57.5	600	314	314	27.4	8,597	50%	3.14	81.5%	1209	7,388
52.5	610	320	320	27.4	8,740	52%	3.58	83.7%	1368	7.372
47.5	611	320	320	27.4	8.754	57%	4.60	87.6%	1680	7.074
42.5	656	344	344	27.4	9.399	61%	5.80	91.1%	2187	7.212
37.5	1.023	536	536	27.4	14.657	66%	7.18	94.0%	4096	10.562
32.5	734	384	384	27.4	10,517	70%	8.77	96.3%	3501	7.016
27.5	334	175	175	27.4	4 786	75%	10.58	98.2%	1885	2,900
22.5	252	132	132	27.4	3 611	80%	12.62	99.5%	1674	1,936
17.5	125	65	65	27.4	1 791	84%	14 91	100.0%	977	814
12.5	47	25	25	27.4	673	89%	17.47	100.0%	430	243
7.5	22	12	12	27.4	315	03%	20.20	100.0%	234	240 81
2.5	13	7	7	27.4	186	08%	20.23	99.6%	160	26
2.5	0			27.4	0	1000/	25.41	99.0 /0	0	20
-2.3	0	0	0	27.4	0	100%	25.00	99.0%	0	0
-7.5	U	U	U	27.4	U	100%	25.08	99.0%	U	U
TOTALS		4,589	4,589	629	125,513				26,924	98,588

Notes:

1) Existing motor power based on operation with existing motor efficiency, operating at 80% load factor when at full load. Formula: Motor HP x 0.746 x 0.8 / Exist. Motor Eff., New motor power is based on same formula using the new motor efficiency.

2) Weather data from NOAA for Newark, NJ International Airport.

3) Occupied & AHU Bin Hours are based upon current Owner reported occuped schedule.

4) The required VFD motor power draw is based on a 3.0 power relationship to load, since system static pressure will not be controlled.

Annual Electrical Utility Savings	98,588	kWh
Annual Savings	\$ 13,309	
Install Variable Speed Drives	\$ 66,956	
- AHU Fans Cost		
Simple Payback	5	Years

West Essex Regional School District	
CHA Project #23985	
High School Building	

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

## ECM-8B: Install Variable Speed Drives - AHU Fans - Cost

Description			UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	DEMARKS
Description	QII	UNIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	TOTAL COST	REMARKS
3.0 HP VFD	2	ea	\$ 1,335	\$ 490		\$ 2,937	\$ 1,323	\$	\$ 4,260	
3.0 HP Motors	2	ea	\$ 465	\$85		\$ 1,023	\$ 230	\$-	\$ 1,253	
5.0 HP VFD	2	ea	\$ 1,485	\$ 490		\$ 3,267	\$ 1,323	\$-	\$ 4,590	
5.0 HP Motors	2	ea	\$ 525	\$85		\$ 1,155	\$ 230	\$	\$ 1,385	
7.5 HP VFD	3	ea	\$ 3,465	\$ 772		\$ 11,435	\$ 3,126	\$-	\$ 14,560	
7.5 HP Motors	3	ea	\$ 1,500	\$ 200		\$ 4,950	\$ 810	\$-	\$ 5,760	
Reprogram DDC system	7	ea	\$ 100	\$ 1,000		\$ 770	\$ 9,450	\$	\$ 10,220	
Electrical - misc.	7	ls	\$ 200	\$ 150		\$ 1,540	\$ 1,418	\$-	\$ 2,958	
Duct pressure sensor/transmitter	7	ea	\$ 500	\$ 200		\$ 3,850	\$ 1,890	\$-	\$ 5,740	

\$ 50,725	Subtotal
\$ 5,072	10% Contingency
\$ 11,159	20% Contractor O&P
\$ -	0% Engineering
\$ 66,956	Total

## ECM-9: HVAC Building Automation System Upgrade/Re-commissioning

#### ECM Description Summary

The exiting HVAC Building Automation System (BAS) controls is outdated and unreliable. Due to BAS condition and software, HVAC systems operate 24/7 during on occupied schedules; facility unoccupied set-back or scheduling, and system temperature reset controls cannot be used. To reduce the energy used by HVAC systems, the BAS and HVAC systems require complete re-commissioning, Testing and Balancing of all HVAC systems, and either a software upgrade or another controls vendor overlaid system. This cost analysis provides simple payback time period by reducing HVAC system energy consumption during unoccupied hours.

Item	Value	<u>Units</u>	Formula/Comments
Baseline Electric Cost	\$ 0.135	/ kWh	
Baseline Natrual Gas Cost	\$ 1.08	/ Therm	
Existing Facility Total Electric Usage	3,153,206	kWh	Based on historical utility data.
Existing Facility Total Gas usage	125,083	Therms	Based on historical utility data.
% of facility total electricity dediated to HVAC cooling systems	26%		Source: E source, data from U.S. Energy Information Administration; See graph below.
% of facility total natural gas dedicated to HVAC heating systems	82%		Source: E source, data from U.S. Energy Information Administration; See graph below.
Existing Facility Cooling Electric usage	819,834	kWh	
Existing Facility Heating Natural Gas usage	102,568	Therms	
Typical savings associated with Retro-Commissioning of controls based on previous project experience	10%		
Re-commissioning Facility Cooling Electric Savings	81,983	kWh	
Re-commissioning Facility Natural Gas Savings	10,257	Therms	
Annual Utility Savings	\$ 22,145	/year	
BAS Upgrade/Re-commissioning total cost	\$ 246,180		
Simple Payback	11	years	

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



Multipliers		
	Material:	1.10
	Labor:	1.35
	Equipment:	1.10

ECM-9: HVAC Building Automation System Upgrade/Re-commissioning - Cost

Description	ΟΤΥ			UN	IT COSTS		SUE	BTC	DTAL COS	TS			DEMARKS
Description		UNIT	MAT.		LABOR	EQUIP.	MAT.		LABOR	EQUIP.		101AL 0031	REMARKS
							\$ -	\$	-	\$	- [	\$-	
Re-commissioning project total cost	1	LS	\$ -	\$	115,000.00	\$-	\$ -	\$	155,250	\$	- [	\$ 155,250	@ \$0.50 per SF (230,000 SF)
Building Automation System Upgrade	1	LS	\$ 10,000	\$	15,000	\$-	\$ 11,000	\$	20,250	\$	-	\$ 31,250	
							\$ -	\$	-	\$	- [	\$-	

\$ 186,500	Subtotal
\$ 18,650.00	10% Contingency
\$ 41,030.00	20% Contractor O&P
\$ -	0% Engineering
\$ 246,180	Total

### Upper Township School District - NJBPU CHA project #23985 West Essex High School Building

		FAN			
		MOTOR		OA	
AIR HANDLER	AREA SERVED	HP	CFM	CFM	
AHU-1	Auditorium	3.0	9,000	3,060	
AHU-2	Auditorium	3.0	9,000	3,060	
AHU-19	Library	7.5	8,000	480	
AHU-20	Library	5.0	3,500	510	
AHU-22	Offices	7.5	5,000	1,420	
AHU-23	Offices	7.5	3,800	620	
AHU-24	Offices	5.0	3,500	980	
		38.5	HP	10,130	CFM

## ECM-10: Add HVAC Demand Control Ventilation

## **ECM Description Summary**

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

Electric Cost	<mark>\$ 0.14</mark> /kWh
Natural Gas Cost	\$ 0.12 /therm
Facility Ventilation Heating Load	3,829 BTU/Hour <sup>1,2,3</sup>
Facility Ventilation Cooling Load	1,094 BTU/Hour <sup>1,2,3</sup>
Existing Ventilation Heating Usage	58 therms <sup>5</sup>
Existing Ventilation Cooling Usage	485 kWh⁵
Proposed Ventilation Heating Usage	46 therms <sup>6</sup>
Proposed Ventilation Cooling Usage	388 kWh <sup>6</sup>
Proposed Ventilation Fan Savings	14,470 kWh <sup>7</sup>
Total heating savings	12 therms
Total cooling savings	14,566 kWh
Total cost savings	\$1,968
Estimated Total Project Cost	\$35,532 <sup>8</sup>
Simple Payback	18 years

## Assumptions

- 1 10,130 CFM, OA AHU airflow based exsiting design drawing schedules
- 2 35 °F, Assumed average heating  $\Delta t$  (mixed air and supply)
- 3 10 °F, Assumed average cooling  $\Delta t$  (mixed air and supply)
- 4 28.7 kW of existing supply fan motor calculated based on electrical data from nameplate
- 5 1,512 AHU run time per heating/cooling seasons [12 hours/day, 21 days/month, 6 months/year]
- 6 20% Estimated savings for DCV based on reducing unit run time from 12 hours to 10 hours per day
- 7 504 Assumed supply fan run time reduction based on 2 hours/day fan is "off" due to DCV
- 8 \$ 35,532 estimated measure cost for installation of sensors and associated controls

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

## ECM-10: Add HVAC Demand Control Ventilation - Cost

Description	ΟΤΥ			UN	IIT COSTS	6	5	SUE	BTOTAL COS	STS	Т		PEMARKS
Description	QTT	UNIT	MAT.		LABOR	EQUIP.	MAT.		LABOR	EQUIP.		01AL 0031	
CO2 sensor	7	ea	\$ 500	\$	150	\$-	\$ 3,850	\$	1,418	\$-	\$	5,268	
Replace damper actuators	21	ea	\$ 250	\$	50	\$-	\$ 5,775	\$	1,418	\$-	\$	7,193	
Reprogram DDC system	7	ea	\$ 150	\$	350	\$-	\$ 1,155	\$	3,308	\$-	\$	4,463	
Miscellaneous electrical/wiring	7	ls	\$ 300	\$	750	\$-	\$ 2,310	\$	7,088	\$-	\$	9,398	

\$ 26,320	Subtotal
\$ 5,264	10% Contingency
\$ 3,948	20% Contractor O&P
\$ -	0% Engineering
\$ 35,532	Total

## ECM-11: Add CoolTrol Walk-In Controls

## ECM Description Summary

The kitchen ontains a 7'x10' walk-in cooler, a 5'x7' walk-in freezer and a 10'x10' walk-in freezer. CoolTrol is a walk-in controller that reduces energy consumption by controlling off of dewpoint temperature. Compressor cycling is reduced and the evaporator fans run 25% to 80% less. Door and frame heaters are also installed and controlled by store dew point temperature; this can reduce run time by up to 95% in coolers and 60% in freezers. The evaporator fan motors are also replaced with hi-efficient fan motors saving 40% to 70% in energy. The proposed system comprises of an anti-sweat door controller, evaporator fan motor replacement and CoolTrol Cooler Control System.

Item	<u>Value</u>	<u>Units</u>	Formula/Comments
Baseline Electric Cost	<b>\$</b> 0.135	/kWh	
Existing Facility Total Electric Usage	3,153,206	kWh	Based on historical utility data.
% of facility total electricity attributable to refrigeration	6%		Source: E source, data from U.S. Energy Information Administration; See graph below.
Existing Facility Refrigeration Electric usage	189,192	kWh	Source: E source, data from U.S. Energy Information Administration; See graph below.
% refrigeration attributable to walk-in based on site observations	85%		Source: E source, data from U.S. Energy Information Administration; See graph below.
Existing Facility Walk-In Electric usage	160,814	kWh	Baseline Fuel Use x Existing Efficiency x 3.413 Mbtu/kWh
Existing Facility Walk-In Electric cost	\$ 21,710	/year	
% electric load reduction typical for walk-in controllers	40%		
Proposed Walk-in Electric usage	96,488	kWh	
Proposed Walk-in Electric cost	\$ 13,026	/year	
Annual Electric Utility Savings	64,325	kWh	
Annual Savings	\$ 8,684	/year	
Add CoolTrol Walk-In Controls project cost	<b>\$</b> 37,500		Based on (3) "Cooltrol" walk-in controls systems, \$12,500 per walk-in
Simple Payback	4	years	

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



## ECM-12: Add Variable Speed Kitchen Hood Controls

## ECM Description Summary

Reduced Financial Savings =

The Kitchen contains a 16'x8' cooking hood with a constant volume 5.0 HP fan, and two (2) makeup air units (MAU-11,12) with 5.0 HP supply fan motors. It is recommended a variable speed kitchen hood controller be installed to reduce run time of the exhaust fan.

Upon activation, the hood lights turn on and the fans reach a preset minimum speed of between 10% and 50%. When cooking appliances turn on, the fan speed increases based on exhaust air temperature. During actual cooking, the speed increases to 100% until smoke and heat are removed. The controller will also send a signal to the kitchen makeup air units to turn on/off the supply fan motor, or to modulate the speed on the supply fan drive based on exhaust air quantity. Variable speed drives with high efficiency motors will need to be installed on the exhaust fan and makeup air units supply fans motors.

Reducing exhaust and make-up fan speed reduces energy consumption. The system and equipment can also act as an economizer when indoor and outdoor conditions are right for free cooling. Finally, the controls reduce hood noise in the kitchen by up to 90% when the fans slow down.

 $\Box$ 

Motor Operatir	ng Savings						
Hours of Operat Days/Year Weeks/Year Motor HP Equivalent KW Cost of Electrici Total Time/Year Total KWH/YR	tion (per day) ty				190 38 15 9.33 \$0.14 760 708	4 5 5 3 KW 4 KWh 0 hrs/year 7 KWh	A B C D E F G H
% Rated RPM	% Run Time J	Time K	Output L	KWH/YR M			
100%	0%	J " G 68	1 E A 2.5	L "K 638	-		
90%	978 11%	84	9.323 7 166	599			
80%	14%	106	5 338	568			
70%	35%	266	3 823	1 017			
60%	18%	137	2.600	356			
50%	13%	99	1.648	163			
40%	0%	0	0.944	0			
30%	0%	0	0.460	0			
20%	0%	0	0.167	0			
10%	0%	0	0.029	0			
				3,340	Ν		
Total Savings	.= H - N	3,747	KWh				
Reduced Elect	ricity Savings	=	3,747	kWh	1		
Reduced Fuel	Savings =		369	therms	1		

Previous New Net Ex Previous nemew net heat Design Indo Average Or Heating Ho Total Thern	et Exhaust khaust Volu et heat load oor Conditio utdoor Air T urs ns Savings	Volume ume d ons Femp (during	Heating)	10,000 7,190 329,400 236,839 68 37.5 4,589 369	CFM CFM BTU/hr BTU/hr F F hrs/yr Therms	Note 1	
% Rated	% Run						
RPM	Time	H * J					
I	J						
100%	9%	9.00%					
90%	11%	9.90%					
80%	14%	11.20%					
70%	35%	24.50%					
60%	18%	10.80%					
50%	13%	6.50%					
40%	0%	0.00%					
30%	0%	0.00%					
20%	0%	0.00%					
10%	0%	0.00%					
Avg RPM		71.90%					
Cost of Fue	el =	\$1.08	/ therm				

Annual Electric Utility Savings	3,747	kWh
Annual Natural Gas Utility Savings	369	Therms
Annual Savings	\$ 904	
Add Variable Speed Kitchen Hood Controls Cost	\$ 42,803	
Simple Payback	47	Years

\$904

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

## ECM-12: Add Variable Speed Kitchen Hood Controls - Cost

Description	ΟΤΥ			UNIT COSTS		SUBTOTAL COSTS			TOTAL	DEMARKS
	QIT	UNIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	COST	REWARKS
						\$-	\$-	\$-	\$-	
Me-Link Kitchen Hood Control System	1	ea	\$ 15,000	\$ 2,000		\$ 16,500	\$ 2,700	\$-	\$ 19,200	
5.0 HP VFDs (1-exhaust fan, 2-MAU fans)	3	ea	\$ 1,485	\$ 490		\$ 4,901	\$ 1,985	\$-	\$ 6,885	
5.0 HP Motors	3	ea	\$ 525	\$85		\$ 1,733	\$ 344	\$-	\$ 2,077	
Reprogram DDC system	1	ea	\$ 100	\$ 1,200		\$ 110	\$ 1,620	\$-	\$ 1,730	
Electrical - misc.	1	ls	\$ 200	\$ 500		\$ 220	\$ 675	\$-	\$ 895	
Remote bulb thermostat	2	ea	\$ 500	\$ 200		\$ 1,100	\$ 540	\$-	\$ 1,640	
						\$-	\$-	\$ -	\$-	

\$ 32,427	Subtotal
\$ 3,243	10% Contingency
\$ 7,134	20% Contractor O&P
\$ -	0% Engineering
\$ 42,803	Total

## APPENDIX D

New Jersey Pay For Performance Incentive Program



## New Jersey Pay For Performance Incentive Program

**Note:** The following calculation is based on the New Jersey Pay For Performance Incentive Program per 2012. Building must have a minimum average electric demand of 200 kW. This minimum is waived for buildings owned by local governements or non-profit organizations.

		Incentive	e #1	
Total Building Area (Square Feet)	232,931	Audit not funded by NJ BPU	\$0.10	\$/sqft
Is this audit funded by the NJ BPU (Y/N)	Yes	Audit is funded by NJ BPU	\$0.05	\$/sqft
Board of Public Utilites (BPU)				

	Annual Utilities					
	kWh	Therms	#2 Fuel Oil	LPG		
Existing Cost (from utility)	\$426,236	\$45,073	<b>\$</b> 0	<mark>\$</mark> 0		
Existing Usage (from utility)	3,153,206	134,272	0	0		
Proposed Savings	1,544,870	-14,721	0	0		
Existing Total MMBtus	24,189					
Proposed Savings MMBtus	3,801					
% Energy Reduction	15.7%					
Proposed Annual Savings	\$192,800					

	Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
	\$/kWh	\$/therm	\$/kWh	\$/therm	\$/kWh	\$/therm	\$/kWh	\$/therm
Incentive #2	\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.09	\$0.94
Incentive #3	\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.09	\$0.94

	Incentives \$				
	Elec	Gas	Total		
Incentive #1	\$0	\$0	\$11,647		
Incentive #2	\$144,537	-\$13,773	\$130,764		
Incentive #3	\$144,537	-\$13,773	\$130,764		
Total All Incentives	\$289,073	-\$27,546	\$273,174		

Total Project Cost \$1,098,200

		Allowable
		Incentive
% Incentives #1 of Utility Cost*	2.5%	\$11,647
% Incentives #2 of Project Cost**	11.9%	\$130,764
% Incentives #3 of Project Cost**	11.9%	\$130,764
Total Eligible Incentives***	\$273	3,174
Project Cost w/ Incentives	\$825	5,026

Project Payback (years)						
w/o Incentives	w/ Incentives					
5.7	4.3					

 $^{\ast}$  Maximum allowable incentive is 50% of annual utility cost if not funded by NJ BPU, and %25 if it is.

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

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

\*\*\* Maximum allowable amount of Incentive #1 is \$50,000 if not funded by NJ BPU, and \$25,000 if it is.

Maximum allowable amount of Incentive #2 & #3 is \$1 million per gas account and \$1 million per electric account

## **APPENDIX E**

•

Photovoltaic (PV) Rooftop Solar Power Generation



Station Identification				
City:	Atlantic_City			
State:	New_Jersey			
Latitude:	39.45° N			
Longitude:	74.57° W			
Elevation:	20 m			
PV System Specifications				
DC Rating:	50.0 kW			
DC to AC Derate Factor:	0.770			
AC Rating:	38.5 kW			
Array Type:	Fixed Tilt			
Array Tilt:	39.5°			
Array Azimuth:	180.0°			
Energy Specifications				
Cost of Electricity:	13.5 ¢/kWh			

	Results						
Month	Solar Radiation (kWh/m <sup>2</sup> /day)	AC Energy (kWh)	Energy Value (\$)				
1	3.61	4473	603.86				
2	4.20	4659	628.97				
3	4.78	5621	758.84				
4	5.23	5773	779.36				
5	5.44	6056	817.56				
6	5.48	5664	764.64				
7	5.55	5857	790.70				
8	5.41	5775	779.62				
9	5.23	5530	746.55				
10	4.60	5171	698.09				
11	3.59	4105	554.18				
12	3.17	3832	517.32				
Year	4.69	62516	8439.66				

#### About the Hourly Performance Data

Saving Text from a Browser

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

 $\label{eq:product} Please \ {\tt send} \ {\tt questions} \ {\tt and} \ {\tt comments} \ {\tt regarding} \ {\tt PVWATTS} \ {\tt to} \ {\tt Webmaster}$ 

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

## NJBPU CHA project #23985

## West Essex HS

Cost of Electricity	\$0.135	/kWh
System Capacity	50.0	kW
System Unit Cost	\$8,000	/kW

## Photovoltaic (PV) Rooftop Solar Power Generation

Budgetary	Annual Utility Savings		Estimated	Total	* Endered Tax	New Jersey Renewable	Payback	Payback		
							Federal Tax		(without	(with
Cost					Maintenance	Savings	Credit	** SREC	incentive)	incentive)
					Savings					
\$	kW	kWh	therms	\$	\$	\$	\$	\$	Years	Years
\$400,000	0.0	62,516	0	\$8,400	0	\$8,400	\$0	\$5,900	>20	>20

\*\* Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= \$95/1000kwh

Estimated Solar Renewable Energy Certificate Program (SREC) payments for 15 Years from RR Renewable Energy Consultants

2012 SREC	95

WEST ESSBY HS



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to develop a personal profile of your own energy use.

Carbon Pollution Calculator Electric Power Pollution Calculator PV System Economics Solar Water Heating What's a Watt?

**Solar Water Heating Calculator** 

Water heating is a major energy consumer. Although the energy consumed daily is often less than for air conditioning or heating, it is required year round, making it a good application of solar energy. Use this calculator to explore the energy usage of your water heater, and to estimate whether a solar water heater could save you money.

Wa	ater Heat	er Characteristics		
Physical Thermal				
2 Diameter (feet)	5.0	Water Inlet Temperature (Degrees F)	58	
Capacity (gallons)	275	Ambient Temperature (Degrees F)	75	
2 Surface Area (calculated - sq ft)	68.68	Hot Water Temperature (Degrees F)	140	
? Effective R-value	5	? Hot Water Usage (Gallons per Day)	3500	
	En	ergy Use		
98180 ? Heat Delivered in Hot Water (BTU/hr)			U/hr)	
892.8		? Heat loss through insulation (BTU/hr)		

Gas vs. Electric Water Heating					
Gas		Electric			
86.07	2 Overall Efficiency	0.9712			
86.85	2 Conversion Efficiency	0.98			
1141 BTU/hr	Power Into Water Heater	101100 BTU/hr			
	Cost				
\$ 1.08 /Therm	? Utility Rates	\$ 0.135 /kWh			
\$ 107.947,	\$ 107.9477, ? Yearly Water Heating Cost \$				
	How Does Solar Compare?				
C So	olar Water Heater Cost: \$ 20000	Percentage Solar: 70			
264.678; years for gas	Payback Time for Solar System	0.81594/years for electric			

More information on solar water heating:

Fact sheet - <u>Solar Water Heaters</u> Fact sheet - <u>Solar Water Heaters for Swimming Pools</u> Kids fact sheet - Heat from the Sun

Return to Top of Page

Multipliers	
Material:	1
Labor:	1
Equipment:	1

Description			UNIT COSTS		SUBTOTAL COSTS				STS	T	TOTAL	DEMADKS	
Description	QTT	UNIT	MAT.	LABOR	EQUIP.	Ν	MAT.	LA	BOR	EQUIP.	(	COST	REMARKS
Synergy Solar Thermal System	2	EA	\$ 2,400	\$ 1,200		\$	4,800	\$	2,400	\$-	\$	7,200	
Piping modifications	1	LS	\$ 1,500	\$ 2,000		\$	1,500	\$	2,000	\$-	\$	3,500	
Electrical modifications	1	LS	\$ 400	\$ 500		\$	400	\$	500	\$ -	\$	900	
2000 GallonStorage Tank	1	EA	\$ 4,600	\$ 281		\$	4,600	\$	281	\$-	\$	4,881	
10 Gallon Drip Tank	1	EA	\$ 100	\$ 80		\$	100	\$	80	\$ -	\$	180	
						\$	-	\$	-	\$-	\$	-	

1	
1	
1	

\$16,661	Subtotal
\$ 1,666	10% Contingency
\$ 1,666	10% Contractor O&P
\$-	10% Engineering
\$19,993	Total

## **APPENDIX F**

**EPA Portfolio Manager** 



## STATEMENT OF ENERGY PERFORMANCE West Essex High School

West Essex Regional School District

65 West Greenbrook Road

North Caldwell, NJ 07006

Building ID: 3129003 For 12-month Period Ending: June 30, 20111 Date SEP becomes ineligible: N/A

**Facility Owner** 

Date SEP Generated: May 03, 2012

Primary Contact for this Facility

N/A

L,

Facility West Essex High School 65 West Greenbrook Road North Caldwell, NJ 07006

Year Built: 1960 Gross Floor Area (ft2): 232,931

Energy Performance Rating<sup>2</sup> (1-100) 32

Site Energy Use Summary <sup>3</sup> Electricity - Grid Purchase(kBtu) Natural Gas (kBtu) <sup>4</sup> Total Energy (kBtu)	10,758,739 14,851,175 25,609,914
Energy Intensity <sup>4</sup> Site (kBtu/ft²/yr) Source (kBtu/ft²/yr)	110 221
<b>Emissions</b> (based on site energy use) Greenhouse Gas Emissions (MtCO <sub>2</sub> e/year)	2,314
Electric Distribution Utility Public Service Electric & Gas Co	

## National Median Comparison

Adequate Illumination

Notes:

National Median Site EUI	94
National Median Source EUI	189
% Difference from National Median Source EUI	17%
Building Type	K-12
	School

Meets Industry Standards <sup>5</sup> for Indoor Environme Conditions:	ntal
Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A

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

**Certifying Professional** N/A

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

N/A

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

## ENERGY STAR<sup>®</sup> Data Checklist for Commercial Buildings

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	$\square$
Building Name	West Essex High School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		
Туре	K-12 School	Is this an accurate description of the space in question?		
Location	65 West Greenbrook Road, North Caldwell, NJ 07006	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of a hospital, k-12 school, hotel and senior care facility) nor can they be submitted as representing only a portion of a building.		
Building (K-12 School)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	$\overline{\mathbf{V}}$
Gross Floor Area	232,931 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		
Open Weekends?	Yes	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		
Number of PCs	850	Is this the number of personal computers in the K12 School?		
Number of walk-in refrigeration/freezer units	3	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		
Months	12(Optional)	Is this school in operation for at least 8 months of the year?		

High School?   Yes   Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.	
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# ENERGY STAR<sup>®</sup> Data Checklist for Commercial Buildings

## Energy Consumption

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

Fuel Type: Electricity				
Meter: Electric 778017386 (kWh (thousand Watt-hours)) Space(s): Building Generation Method: Grid Purchase				
Start Date	Start Date End Date Energy Use (kWh (thousand Wat			
06/01/2011	06/30/2011	256,103.00		
05/01/2011	05/31/2011	216,552.00		
04/01/2011	04/30/2011	273,306.00		
03/01/2011	03/31/2011	284,336.00		
02/01/2011	02/28/2011	285,832.00		
01/01/2011	01/31/2011	307,962.00		
12/01/2010	12/31/2010	252,010.00		
11/01/2010	11/30/2010	223,866.00		
10/01/2010	10/31/2010	268,941.00		
09/01/2010	09/30/2010	250,432.00		
08/01/2010	08/31/2010	271,524.00		
07/01/2010	07/31/2010	262,342.00		
Electric 778017386 Consumption (kWh (thous	and Watt-hours))	3,153,206.00		
Electric 778017386 Consumption (kBtu (thous	and Btu))	10,758,738.87		
Total Electricity (Grid Purchase) Consumption	Fotal Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))     10,758,738.87			
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?				
Fuel Type: Natural Gas				
	Meter: Natural Gas 2807073 (therms) Space(s): Building			
Start Date	End Date	Energy Use (therms)		
06/01/2011	06/30/2011	951.77		
05/01/2011	05/31/2011	5,723.83		
04/01/2011	04/30/2011	17,764.96		
03/01/2011	03/31/2011	24,766.01		
02/01/2011	02/28/2011	27,458.86		
01/01/2011	01/31/2011	38,329.67		
12/01/2010	12/01/2010 12/31/2010 23,428.78			
11/01/2010	11/01/2010 11/30/2010 8,527.88			
10/01/2010 10/31/2010 441.17				
10/01/2010	10/31/2010	441.17		

08/01/2010	280.75		
07/01/2010	535.64		
Natural Gas 2807073 Consumption (therms)	148,511.75		
Natural Gas 2807073 Consumption (kBtu (thousand Btu))		14,851,175.00	
Total Natural Gas Consumption (kBtu (thousand Btu))		14,851,175.00	
Is this the total Natural Gas consumption at this building including all Natural Gas meters?			

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

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

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

Name: \_\_\_\_\_\_ Date: \_\_\_\_\_\_

Signature: \_\_\_\_\_

Signature is required when applying for the ENERGY STAR.

## FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

#### Facility

West Essex High School 65 West Greenbrook Road North Caldwell, NJ 07006

#### **Facility Owner**

West Essex Regional School District 65 West Greenbrook Road North Caldwell, NJ 07006

## Primary Contact for this Facility N/A

#### **General Information**

West Essex High School	
Gross Floor Area Excluding Parking: (ft <sup>2</sup> )	232,931
Year Built	1960
For 12-month Evaluation Period Ending Date:	June 30, 2011

## **Facility Space Use Summary**

Building			
Space Туре	K-12 School		
Gross Floor Area (ft2)	232,931		
Open Weekends?	Yes		
Number of PCs	850		
Number of walk-in refrigeration/freezer units	3		
Presence of cooking facilities	Yes		
Percent Cooled	100		
Percent Heated	100		
Months °	12		
High School?	Yes		
School District °	West Essex		

## **Energy Performance Comparison**

	Evaluation Periods		Comparisons		ons
Performance Metrics	Current (Ending Date 06/30/2011)	Baseline (Ending Date 06/30/2011)	Rating of 75	Target	National Median
Energy Performance Rating	32	32	75	N/A	50
Energy Intensity					
Site (kBtu/ft <sup>2</sup> )	110	110	74	N/A	94
Source (kBtu/ft <sup>2</sup> )	221	221	148	N/A	189
Energy Cost					
\$/year	\$ 560,051.88	\$ 560,051.88	\$ 375,099.78	N/A	\$ 479,673.36
\$/ft²/year	\$ 2.40	\$ 2.40	\$ 1.61	N/A	\$ 2.06
Greenhouse Gas Emissions					
MtCO <sub>2</sub> e/year	2,314	2,314	1,550	N/A	1,982
kgCO <sub>2</sub> e/ft <sup>2</sup> /year	10	10	7	N/A	9

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

Notes:

o - This attribute is optional.

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

# Statement of Energy Performance

# 2011

West Essex High School 65 West Greenbrook Road North Caldwell, NJ 07006

Portfolio Manager Building ID: 3129003

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



Date Generated: 05/03/2012