Energy Audit

Prepared For:
Lakeland Regional High School

Contact :
Michael D. Leary
School Business Administrator

Prepared By:
Dome – Tech, Inc.

Prepared Under the Guidelines of the State of NJ Local Government Energy Audit Program

October, 2009

Dome-Tech, Inc.

510 Thornall Street, Suite 170
Edison, NJ 08837
Phone: 732-590-0122
Fax: 732-590-0129

Dome-Tech, Inc.

www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

LAKELAND REGIONAL HIGH SCHOOL
ENERGY AUDIT REPORT
TABLE OF CONTENTS

Dome-Tech, Inc.

www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837

Tel: 732.590.0122
Fax: 732.590.0129

October 2, 2009

Mr. Michael Leary
School Business Administrator
205 Conklintown Road
Wanaque, NJ 07465

Re: EXECUTIVE SUMMARY FOR LAKELAND REGIONAL HIGH SCHOOL BOARD OF EDUCATION STATE OF NEW JERSEY LOCAL GOVERNMENT ENERGY AUDIT

Dear Mr. Leary:

Dome-Tech was retained by Lakeland Regional High School Board of Education, as a pre-qualified participant in the New Jersey Local Government Energy Audit Program, to perform an energy audit. The objective of the energy audit was to evaluate the schools' energy consumption, establish baselines for energy efficiency and identify opportunities to reduce the amount of energy used and/or its cost.

The scope of the audit is standardized under the Program, and consisted of the following:

- Benchmarking historic energy consumption utilizing EPA Energy Star's Portfolio Manager
- Characterizing building use, occupancy, size, and construction
- Providing a detailed equipment list including estimated service life and efficiency
- Identifying and quantifying energy conservation measures (ECMs)
- Evaluating the economic viability of various renewable/distributed energy technologies
- Performing a utility tariff analysis and assessing savings potential from energy procurement strategies
- Providing the method of analyses

Based upon data received for the period Jan 2008 – Feb 2009, Lakeland Regional High School had an annual expenditure of:

- Electricity: 2,246,000 kWh at a total cost of $375,665
- Natural Gas: 110,677 therms at a total cost of $174,437

Please refer to Section 2 of this report for a detailed list of identified Energy Conservation Measures (ECMs), along with a summary of their preliminary economics (estimated project cost, estimated annual energy savings, applicable rebate(s), etc.) In this report, all identified ECMs are ranked and presented according to their simple payback; however, please note that the master ECM table can also be sorted by building, by measure type, cost, etc.

If all identified ECMs were to be implemented, they would provide the following estimated benefits to Lakeland Regional High School Board of Education:

- Total annual electrical savings: 366,400 kilowatt-hours; 16.3%
- Total annual natural gas savings: 48,400 therms, 43%
- Total annual cost savings: $132,570; 26.5%
- Total annual CO_2 emissions reduction: 404 tons
- Total estimated gross implementation cost: $628,500
- Rebates: $40,370
- Total estimated net implementation cost: $588,130
- Total average simple payback: 4.4 yrs

The projects that are recommended for implementation include: optimizing the temperature setpoints, upgrading lighting, installing high efficiency modular condensing boilers, implementing economizers and demand control ventilation, installing solar photovoltaics, and instituting an energy awareness program.

The Lakeland Regional High School data was entered into the US EPA ENERGY STAR's Portfolio Manager database program. The school attained a score of 26. Buildings with scores of 75 or higher may qualify for the ENERGY STAR Building Label.

Distributed/Renewable Energy Systems were reviewed for the school with the following conclusions:

- A Ground Source Heat Pump (GSHP) installation is not recommended as an immediate retrofit project. However, a detailed life cycle analysis of a GSHP system versus a traditional HVAC system is recommended once the existing equipment exceeds the estimated equipment service life.
- Dome-Tech considered three different types of wind turbine technologies that consisted of both building-mounted and traditional ground-mounted variety. Due to attractive payback and high potential for energy reduction, the 50 kilowatt ground mounted wind turbine project appears to be the most attractive option. Should Lakeland Regional High School BOE decide to pursue a wind turbine project, Dome-Tech recommends commissioning a more detailed study.
- A roof-mounted 380 kw dc photovoltaic system that could provide 18% of the school's annual energy usage was assessed for implementation.
- CHP, Fuel Cells, and Micro-turbines were also researched, but are not recommended due to the lack of thermal requirements in the summertime.

Regarding the procurement of utilities, Dome-Tech understands that Lakeland Regional High School BOE is served by three electric accounts behind Jersey Central Power & Light, under General Service rate class. Dome-Tech understands that Lakeland Regional High School BOE has Basic Generation Service Fixed Price accounts that are currently not contracted with a retail energy supplier. The district is also served by four natural gas meters behind Public Service Electric and Gas Company. Now is an ideal time to seek longer-term rate stability through a fixed price arrangement through a retail supplier.

During the development of this audit, Dome-Tech was assisted by facility personnel, who were both knowledgeable and very helpful to our efforts. We would like to acknowledge and thank those individuals.

Sincerely,

John Butterly
Senior Energy Engineer

Lakeland Regional HS
ECO/ECM Summary

Prepared by Dome-Tech, Inc.

	Energy Conservation Measures (ECM)	Building/ Area	Energy Savings			Gross Installation Costs*	Rebates/ Incentives	Net Implementation Costs	Annual Energy Cost Savings*	Annual Operating Cost Savings*	Total Annual Cost Savings*	Simple Pay Back*	Annual Avoided CO_2 Emissions	Return on Investment (ROI)	Lifecycle Cost Savings*
			kWh	KW	Therms										
1	Temperature Set point Optimization	Main Bldg	2,400	0	1,100	$ 960	$ -	$ 960	$ 2,100	$ -	$ 2,100	0.5	7	NA	NA
2	Lighting	All	340,000	76	0	$ 210,000	$ 24,000	$ 186,000	$ 52,000	$ -	$ 52,000	3.6	112	NA	NA
3	Install High Efficiency Modular Condensing Boilers	New Bldg	0	0	45,000	$ 290,000	$ 15,000	$ 275,000	$ 71,000	$ -	$ 71,000	3.9	263	804%	$ 2,485,000
4	Install Premium Efficiency Motors	All	15,000	10	0	$ 17,400	$ 1,370	$ 16,030	$ 2,400	$ -	$ 2,400	6.6	5	169%	$ 43,200
5	Install Fan Controls on Walk-in Cooler Evaporators	Main Bldg	2,200	0	0	$ 4,000	$ -	$ 4,000	$ 370	$ -	$ 370	10.8	1	NA	NA
6	Implement economizer & DCV modes	New Bldg	6,800	0	2,300	$ 106,140	$ -	$ 106,140	$ 4,700	$ -	$ 4,700	22.6	16	NA	NA
Totals			366,400	86	48,400	$ 628,500	$ 40,370	$ 588,130	$ 132,570	$ -	$ 132,570	4.4	404	330%	$ 2,528,200

Energy Audit Purpose & Scope

Purpose:

- The objectives of the energy audit are to evaluate the site's energy consumption, establish baselines for energy consumption and identify opportunities to reduce the amount of energy used and/or its cost.

Scope:

I. Historic Energy Consumption: Benchmark energy use using Energy Star Portfolio Manager

II. Facility Description – characterize building usage, occupancy, size and construction.

III. Equipment Inventory – detailed equipment list including useful life and efficiency.

IV. Energy Conservation Measures: Identify and evaluate opportunities for cost savings and economic returns.

V. Renewable/Distributed Energy Measures: evaluate economic viability of various renewable/distributed energy technologies.

VI. Energy Purchasing and Procurement Strategies: perform utility tariff analysis and assess potential for savings from energy procurement strategies.

VII. Method of Analysis: Appendices

Historic Energy Consumption

Utility Usage and Costs Summary Time-period: Jan. 2008 – Feb. 2009

SCHOOL	Electric			Natural Gas		
	Annual kWh	Annual Cost	$ / kWh	Annual Therms	Annual Cost	$ / Therm
LAKELAND HIGH SCHOOL	2,246,000	$375,665	$0.17	110,677	$174,437	$1.58

Please see Appendix for full utility data and consumption profile.

Historic Energy Consumption

ENERGY STAR SCORES

- Energy Star Score is calculated to establish a facility-specific energy intensity baseline.
- Energy Star can be used to compare energy consumption to other similar facilities and to gauge the success of energy conservation and cost containment efforts.
- Buildings with an Energy Star score of 75 or above are eligible to apply for an official Energy Star Building label.

Facility Name	Total Floor Area	Energy Star Score	Eligible to Apply for ENERGY STAR	Current Site Energy Intensity (kBtu/SF)	Current Source Energy Intensity (kBtu/SF)
Lakeland Regional HS	204337	26	NA	87.9	177.1

Historic Energy Consumption (continued)

Portfolio Manager Sign-In

- An account has been created for Lakeland Regional High School in the EPA's energy tracking system known as the Energy Star "Portfolio Manager". You will receive an email from Energy Star notifying you of the creation of this account by Dome-Tech. Your facility's information is currently shared as read only. We would ask that you leave the sign-in information unchanged until the Dome-Tech report is finalized and accepted. Once the report is finalized the access will be changed so that you can edit the information as you wish.
- Dome-Tech highly recommends you continue to use Portfolio Manager to track your energy usage in the future.
- Website link to sign-in: https://www.energystar.gov/istar/pmpam/index.cfm?fuseaction=login.Login
  - Username: LakelandHS
  - Password: DTLakelandHS
  - Email for account: mleary@lakeland.k12.nj.us

Facility Information

- **Building Name:** **Lakeland Regional HS**

Address:	205 Conklintown Road
	Wanaque, NJ
Gross Floor Area:	204,337 SF
Year Built:	1958 (main bldg)
	1974/1975 (new bldg)
Grades:	9-12
# Students/ # Staff:	1176/200

- **Construction Features:**

Facade:	Masonry, steel frame
Roof Type:	flat, built-up, in good to fair condition
Windows:	Dual pane, operable; in good condition
Exterior Doors:	metal clad with some glazing, in good condition

Facility Information (cont.)

Major Mechanical Systems:

General Description:

- Both the Main and the New buildings are served by central air handling units (AHUs) and unit ventilators (univents) equipped with hot water coils supplied from central boiler plants. Both systems are constant volume.
- Some of the Main building AHUs are equipped with direct expansion (Dx) cooling coils supplied by remote compressors on the roof (i.e. “split systems”). Most of the New building AHUs and univents are equipped with chilled water coils supplied from a central chiller plant located outdoors in the rear of the New building.
- The equipment servicing the Main building was replaced relatively recently (with the exception of the built-up AHUs in the fan rooms) and is in good condition. The systems are controlled by a centralized, Automated Logic, digital building management system (BMS).
- The equipment servicing the New building is mostly original to the building and is approximately 30 years old. ASHRAE estimates the useful service life of this kind of equipment to be about 25 years. There is no central control system and the equipment is currently controlled by antiquated, distributed pneumatic control systems and timers. While obsolete, the pneumatic controls are in serviceable condition and seemed to be functioning. The operating staff at Lakeland RHS should be commended on its diligent maintenance of this equipment.

Facility Information (cont.)

Air Handlers / AC Systems / Ventilation Systems

Main Building:

- Thirteen (13) Trane, built-up, heating-ventilating (HV) units equipped with hot-water coils. Supply fans range from 1,400 to 6,000 cfm. All appeared in good condition, however, many appeared to be at least 25 years old. ASHRAE estimates the useful service life of this equipment to be about 25 years.
- Twelve (12) Trane, built-up, heating-ventilating-air conditioning units (HVAC). Some with Dx cooling coils. Some with chilled water coils that are not connected (in anticipation of chilled water eventually being available?) Supply fans range from 400 to 3,200 cfm. All appeared in good condition, however, many appeared to be at least 25 years old.
- Three (3) Trane, 7.5 ton, packaged roof-top air handling units (PRTUs) equipped with Dx cooling coils and natural gas, direct-fired, heating coils. All were approximately seven years old and appeared in good condition.
- Eighteen (18) Trane unit ventilators in various classrooms and offices. Fans range from 750 to 1,500 CFM.

New Building:

- Seven (7) Trane, built-up, HVAC units with hot water heating coils and chilled water cooling coils. Supply fans range from 5,700 to 16,000 cfm. All appeared in serviceable condition, however, many appeared to be at least 25 years old.
- Twenty-six (26) Nesbitt unit ventilators in various classrooms and offices. Fans range from 750 to 1,850 CFM.

Facility Information (cont.)

Boilers / Heating Systems

Main Building:

- Six (6) Patterson-Kelley, 1.7 MMBtu, natural gas fired, direct vent, hot water boilers. 5 – 10 years old and in good condition.

New Building:

- Two (2) Cleaver-Brooks natural gas fired, direct vent boilers approximately 35 years old and in serviceable condition. ASHRAE estimates the useful service life of this kind of equipment to be about 25 years.

Domestic Hot Water (DHW) Heating Systems

New Building:

- Two (2) A.O. Smith 140 gallon natural gas fired hot water heaters approximately 10 years old and in good condition.

Facility Information (cont.)

Chillers

New Building:

- Two (2) Carrier, 100 ton, air-cooled chillers with scroll compressors and R-601 refrigerant. The equipment appeared 20 - 25 years old and in serviceable condition. ASHRAE estimates the useful service life of this kind of equipment to be about 20 years.
- One (1) McQuay, 100 ton, air-cooled chiller with scroll compressors and R-22 refrigerant. The equipment appeared to be approximately 10 years old and in good condition.

Greenhouse Gas Emission Reduction

Implementation of all the identified ECOs will yield:

- 366,400 kilowatt-hours of annual avoided electric usage.
- 48,400 therms of annual avoided natural gas usage.
- This equates to the following ***annual*** reductions:

- 404 tons of CO_2;

  -OR-

- 70 cars removed from road;

  -OR-

- 110 acres of trees planted annually

The Energy Information Administration (EIA) estimates that power plants in the state of New Jersey emit 0.66 lbs CO_2 per kWh generated.

The Environmental Protection Agency (EPA) estimates that one car emits 11,560 lbs CO_2 per year.

The EPA estimates that reducing CO_2 emissions by 7,333 pounds is equivalent to planting an acre of trees.

Notes and Assumptions

- Project cost estimates were based upon industry accepted published cost data, rough order of magnitude cost estimates from contractors, and regional prevailing wage rates. The cost estimates presented in this report should be used to select projects for investment grade development. **The cost estimates presented in this report <u>should not</u> be used for budget development or acquisition requests.**
- The following utility prices provided were used within this study:
  - *Electricity Cost ($/kWh):* *$0.167*
  - *Natural Gas Cost ($/Therm):* *$1.58*
- The average CO_2 emission rate from power plants serving the facilities within this report was obtained from the Environmental Protection Agency's (EPA) eGRID2007 report. It states that power plants within the state of NJ emit 0.66 lbs of CO_2 per kWh generated.
- The EPA estimates that burning one therm of natural gas emits 11.708 lbs CO_2.
- The EPA estimates that one car emits 11,560 lbs CO_2 per year.
- The EPA estimates that reducing CO_2 emissions by 7,333 pounds is equivalent to planting an acre of trees.

Energy Conservation Measure ("ECM") # 1: Optimize Space Temperature Setpoints

Estimated Annual Savings:	$2,100
Gross Estimated Implementation Cost:	$960
NJ Smart Start Rebate:	-
Net Estimated Implementation Costs:	$960
Simple Payback (yrs):	0.5
Annual Avoided CO_2 Emissions (tons):	7

- A review of the building management system controlling the HVAC equipment in the Main Building revealed room temperature setpoint inconsistencies. Heating temperature setpoints ranged from 65 - 76°F. Cooling temperature setpoints ranged from 68 - 80°F. Incorrect setpoints can waste energy through over-cooling or over-heating. Sometimes additional energy is wasted by running other systems to compensate for this over-cooling or over-heating.
- Setpoints tend to migrate over time for various reasons. Often they are changed to compensate for temporary conditions but then are not returned to the correct values when the temporary conditions are no longer present. Setpoints that always must be moved beyond standard values are indicative of other HVAC problems that should be investigated and corrected.

ECM # 1: Optimize Space Temperature Setpoints (cont.)

- Dome-Tech recommends that Lakeland RHS adopt standard setpoints of 70°F for heating and 74°F for cooling. Operating staff should institute a regular schedule to review and reset all setpoints.
- Accordingly, Dome-Tech also recommends the following setpoints be changed :

Unit	Current Heating Setpoint (deg F)	Proposed Heating Setpoint (deg F)
Music Room	73	70
HVAC-1	71	70
HVAC-8	73	70
UV_C_B	71	70
HVAC-9	73	70
UV_Erase	73	70
UV_Faculty	73	70
RTU-1	71	70
UV_Teachers	76	70
HV-13	72	70

Unit	Current Cooling Setpoint (deg F)	Proposed Cooling Setpoint (deg F)
RTU-2	73	74
RTU-3	73	74

ECM # 2: Lighting Upgrade

Estimated Annual Energy Cost Savings:	$52,000
Gross Estimated Implementation Cost:	$210,000
NJ Smart Start Rebate:	$24,000
Net Estimated Implementation Costs:	$186,000
Simple Payback (yrs): (with rebate)	3.6
Annual Avoided CO_2 Emissions (tons):	112

- Although many of the current light fixtures have higher efficiency T-8 fluorescent lamps and ballasts, improved light fixture designs will further reduce lighting energy costs by reducing the total number of lamps and fixtures while maintaining the minimum lighting output as per state codes.

- Many areas were observed to have lights on regardless of occupancy. Installing occupancy sensors in these areas will automatically turn lights on/off according to actual occupancy by sensing the presence of people in the room. Occupancy sensors will reduce lighting energy costs by approximately 30%*.

*Source: Turner, Wayne, Energy Management Handbook, 1999.

ECM # 3: Replace Firetube Boilers with Modular High Efficiency Condensing Boilers

- The new building has two (2) 250 HP, 10,460,000 Btu/hr Cleaver Brooks boilers.
- These boilers are 35 years old and beyond their expected service life (ASHRAE states the service life of similar equipment to be 25 years).
- The boilers' age, size, type and configuration do not lend themselves to cost-efficient operation.
- If the existing boilers were replaced with modular, high efficiency, gas-fired condensing boilers, savings will be realized in multiple ways:
  - First, when the old boiler starts a good deal of energy is used just to reheat the boiler's massive structure. In modular boiler applications, multiple, smaller boilers are installed to meet the overall building load. The smaller, less massive structures of these boilers do not absorb as much energy as they heat up to operating temperature.
  - Second, each modular boiler operates independently, eliminating the "all on/all off" operation of single burner boilers. As building load changes only those units necessary to meet the load are fired and only the last one called for will be operating at less than full load. This allows each unit to run at optimal efficiency.
  - Finally, condensing boilers recover energy from the exhaust flue gasses creating even greater efficiency gains.

ECM # 3: Replace Firetube Boilers with Modular High Efficiency Condensing Boilers (cont.)

Replacing the existing boilers with modular high efficiency condensing boilers yields the following:

New Building	
Estimated Annual Energy Cost Savings:	$71,000
Gross Estimated Implementation Cost:	$290,000
NJ Smart Start Rebate:	$15,000
Net Estimated Implementation Cost:	$275,000
Simple Payback (years):	3.9
Annual Avoided CO_2 Emissions (tons):	263

ECM # 4: Premium Efficiency Motors

	Main Building	New Building	TOTALS
Estimated Annual Energy Cost Savings:	$50	$2,380	**$2,430**
Estimated Gross Implementation Costs:	$720	$16,680	**$17,400**
NJ Smart Start Rebate:	$80	$1,290	**$1,370**
Net Estimated Implementation Costs:	$640	$15,390	**$16,030**
Estimated Simple Payback:	12.8	6.5	**6.5**
Annual Avoided CO_2 Emissions (tons):	0.1	4.9	**5**

- Most of the existing motors serving the AHU's and pumps are standard efficiency motors.
- Dome-Tech recommends replacing the regularly operated standard efficiency motors (pumps and large AHU's) listed below with new premium efficiency motors.
- These new motors would reduce the electrical consumption of the buildings' motors by approximately $2,400/year.
- For all other motors, when the motor starts to fail it is recommended that they are replaced with new premium efficiency motors.

ECM # 4: Premium Efficiency Motors (cont.)

Standard & Premium Efficiencies for Motors
(1800 RPM Open Drip-Proof Motors)

Location	Equipment	HP	Existing Efficiency	Proposed Efficiency
New Bldg Boiler Rm	Heating Hot Water Circ Pump	40	90.1%	94.1%
New Bldg Boiler Rm	Heating Hot Water Circ Pump	40	90.1%	94.1%
New Bldg Boiler Rm	Chilled Water Circ Pump	60	84.0%	95.0%
New Bldg Boiler Rm	Chilled Water Circ Pump	60	84.0%	95.0%
New Bldg, Fan Rm B	HVAC-3 Supply Fan	7.5	89.5%	91.7%
New Bldg, Fan Rm B	HVAC-4 Supply Fan	15	88.0%	93.0%
New Bldg, Fan Rm B	HVAC-6 Supply Fan	15	88.0%	93.0%
New Bldg, Fan Rm B	HVAC-7 Supply Fan	15	88.0%	93.0%
New Bldg, Fan Rm B	HVAC-8 Supply Fan	15	88.0%	93.0%
Main Bldg, Fan Rm D	HVAC-12 Supply Fan	7.5	88.5%	91.0%

ECM # 5: Walk-In Cooler Controllers

Estimated Annual Energy Cost Savings:	$370
Estimated Gross Implementation Costs:	$4,000
NJ Smart Start Rebate:	$0
Net Estimated Implementation Costs:	$4,000
Estimated Simple Payback:	10.8
Annual Avoided CO_2 Emissions (tons):	1

- Typically, walk-in cooler evaporator fans run continuously. However, full airflow is only required when the compressor is running (about 50% of the time).
- In most applications, the motors for these fans are small but release significant amounts of heat into the cooler or freezer box. This heat must then be removed by the compressor.
- Inexpensive controllers are currently available that slow these fans when the compressor is not running and full-speed operation is unnecessary.
- Reducing the fan speed reduces the amount of heat produced by the fans. This allows the compressor to consume less energy because there is less heat to remove from the compartment.
- In addition, reducing the fan speed also reduces the amount of energy consumed by the fans themselves so savings are achieved in two ways.

ECM # 6: Implement Economizer & Demand Control Ventilation Operating Modes in New Bldg

Estimated Annual Savings:	$4,700
Gross Estimated Implementation Cost:	$106,140
NJ Smart Start Rebate:	-
Net Estimated Implementation Cost:	$106,140
Simple Payback:	22.6
Annual Avoided CO_2 Emissions (tons):	16

- The air handling units in the new building at Lakeland Regional High School are controlled via pneumatic actuators. Upgrading to digital controls will allow these units to perform several operations such as economize and demand control ventilation which will decrease energy consumption.
- Economizing involves using cool outside air as a cooling source rather than mechanical cooling whenever outside air temperature and humidity levels make this economic. This “free cooling” opportunity is most often available in the spring and the fall.

ECM # 6: Implement Economizer & Demand Control Ventilation Operating Modes (cont.)

- Demand Control Ventilation (DCV) is a control strategy employed in areas that experience large swings in occupation levels such as gyms, auditoriums and cafeterias. In order to implement DCV the spaces need to be served by AHUs dedicated to those areas. Carbon dioxide sensors are deployed to detect the level of CO_2 in the spaces. CO_2 levels will rise and fall depending on the number of people in the controlled area. Fan speeds and outside air volumes are controlled to ensure CO_2 remains below code limits. Savings are achieved by lowering fan speeds and outside air volumes when the spaces are not occupied.
- Normally, economizing and DCV are implemented via a building's digital Building Management System (BMS) but in this case the savings generated do not justify the cost of completely replacing the New Building's current pneumatic control system with a digital BMS.
- However, the savings can be achieved by installing sensors and less expensive digital controllers only on the equipment needed to implement economizing and DCV. The appendix contains the details of this equipment as well as the savings calculations.

ECM # 7: Creation of an Energy Awareness & Education Program

- Lakeland Regional High School currently has little or no observed program in place.
- Educational institutions are where our nation's youth spend a significant portion of their time. As such, educators can have a potentially large impact on promoting an energy conscious and conservation-minded society that starts at their school, leading to energy cost reductions, environmental benefits, and national energy independence.
- In addition, schools can receive recognition for their efforts and possible media coverage, which can contribute to enhanced school spirit, and individual feelings of accomplishment and connection.

Estimated Annual Savings:	2-3%*
Gross Estimated Implementation Cost:	$1,500
NJ Smart Start Rebate:	-
Net Estimated Implementation Costs:	$1,500
Simple Payback (yrs): (with and w/o rebate)	Varies
Annual Avoided CO_2 Emissions (tons):	Varies
Cost per Ton CO_2 Reduction ($/ton):	Varies

* Estimated Annual Savings are based on the robustness of the program implemented, maintenance, and annual energy costs.

Renewable/Distributed Energy Measures

Distributed Generation & Renewable Energy

- Distributed Generation (on-site generation) generates electricity from many small energy sources. These sources can be renewable (solar/wind/geothermal) or can be small scale power generation technologies (CHP, fuel cells, microturbines)
- Renewable energy is energy generated from natural resources (sunlight, wind, and underground geothermal heat) which are naturally replenished
- Photovoltaics (solar) are particularly popular in Germany and Spain and growing in popularity in the U.S.
- Wind power is growing as well, mostly in Europe and the U.S.
- Geothermal applications are used widely in western U.S. (most prominent in the Yellowstone basin and in northern California)

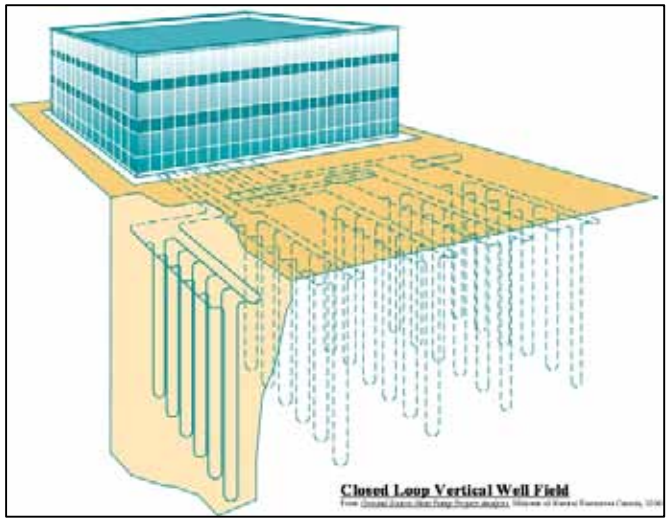
Renewable Energy Technologies: Geothermal

Geothermal ground source heat pump (GSHP) systems are HVAC systems that use the earth's relatively constant temperature to provide heating or cooling to a system. In doing so, GSHP systems move 3 to 5 times more energy between the building and the ground than is actually consumed by the system components. In comparison, this represents a 30% decrease in energy consumption when compared to conventional HVAC systems that required chillers or refrigeration coils for cooling and boilers or electric resistance coils for heating.

A GSHP system consists of three major components: the heat pump, the well field, and the heating/cooling distribution system.

Heat Pump

The heat pump is the driving force behind a GSHP system. A typical heat pump is an "air-to-water" unit, meaning the fluid carries heat to and from the earth (via the earth connection) is a water or water/antifreeze mixture, and the HVAC distribution system in the building distributes hot or cold air. Heat pumps are self-contained in a single enclosure and consist of a refrigerant compressor, earth heat sink heat exchanger, and an air distribution system (fan, refrigerant-to-air heat exchanger, and condensate removal). Heat pumps range in size between 1 to 30 tons. For larger facilities (such as schools and office buildings), several heat pump units are required.



Well Field

The well field provides the heat exchanging mechanism between the GSHP system water side and the earth. Well fields are either open or closed systems. Open systems directly draw from an adjacent water source such as a lake or aquifer. Closed systems are typically polyurethane tubing buried in horizontal trenches or boreholes. The system selected for this analysis is a closed loop, horizontal well field. Wells are typically 250 to 500 feet deep each, and provide 1 ton of cooling for every 250 linear feet. Wells are spaced at 15 to 20 feet on center, and larger systems can have a significant footprint. In addition, the well boring portion of the project is capital intensive and usually accounts for over 50% of the total GSHP system cost. Once installed, the well field has a estimated equipment service life of over 50 years.

Heating/Cooling Distribution System

The heating/cooling distribution system consists of the ductwork used to supply conditioned air the building. As previously stated, larger facilities often require multiple heat pumps connected to a common building loop. Buildings equipped with GSHP's may also require make-up air units to provide fresh air to the spaces, as well as an auxiliary heat source (such as a boiler or electric duct heaters) to supplement heating during extreme cold periods.

Renewable Energy Technologies: Geothermal

The project economics and GSHP pro's and cons are presented in the following tables:

GSHP Economics*

	GSHP	DX Roof Top
Gross Installation Cost Estimate	$3,577,000	$2,555,000
NJ SSB Rebate	$189,070	$40,369
Net Installation Cost Estimate	$3,387,930	$2,514,631
Annual Energy Cost	$259,379	$356,095
Annual Electric Use, kWh	1,550,757	1,190,380
Annual Natural Gas Use, Therms	0	99,609
Annual CO_2 Emissions, Tons	543	1,000

*Based upon Lakeland Regional High School HVAC Systems & Energy Profile

Simple Payback on Net Install Cost GSHP

Net Installation Cost Estimate	$3,387,930
Annual Energy Savings	$96,716
Simple Payback, Yrs	35

Simple Payback on Incremental Cost of GSHP

Net Installation Cost Estimate	$873,299
Annual Energy Savings	$96,716
Simple Payback, Yrs	9

GSHP Pros & Cons

Pros	Cons
➢Annual HVAC energy reduction of over 30% and energy spend by over $95,000. ➢Well fields installations typically last over 50 years. ➢Reduction of annual greenhouse gas emissions by 457 tons per year. ➢Potential for removal of boilers and chillers / low efficiency Dx refrigeration systems. ➢Potential for reduced maintenance costs if the GSHP system replaces a cooling tower or other equipment.	➢Payback period is longer than expected life of heat pump equipment (exclusive of well field). ➢Ground conditions are not always conducive to a well field installation. Conditions unknown until drilling is complete. ➢The well field requires a significant amount of real estate. In this case, well over an acre of land may be required depending on depth of well field.

A GSHP installation is not recommended as an immediate retrofit project. However, a detailed life cycle analysis of a GSHP system versus a traditional HVAC system is recommended once the existing equipment exceeds the estimated equipment service life.

Renewable Energy Technologies: Wind

Wind turbines generate electricity by harnessing a wind stream's kinetic energy as it spins the turbine airfoils. As with most renewable energy sources, wind energy is subject to intermittent performance due to the unpredictability of wind resources.

Lakeland Wind Speed

As previously stated, wind speed is critical to the successful wind turbine installation. According to average wind data from NASA's Surface Meteorology and Solar Energy records, the average annual wind speed for the Wanaque area is 4.6 meters per second. Ideal wind speeds for a successful project should average over 6 meters per second.

For the Lakeland High School, Dome-Tech considered three (3) types of wind turbine technologies; building integrated wind turbines (1 kW each) and traditional ground mounted wind turbines (5 kW & 50 kW).

Building Integrated Wind Turbines
Model: AeroVironment AVX1000
Height: 8.5'
Rotor Diameter: 6'
Weight: 130 lbs.
Cut-In Wind Speed: 2.2 m/s
Maximum Generating Capacity: 1 kW

5 kW Ground Mount
Model: WES5 Tulipo
Height: 40'
Rotor Diameter: 16'
Weight: 1,900 lbs.
Cut-In Wind Speed: 3.0 m/s
Maximum Generating Capacity: 5.2 kW

50 kW Ground Mount
Model: Entegrity EW50
Height: 102'
Rotor Diameter: 50'
Weight: 21,000 lbs.
Cut-In Wind Speed: 4.0 m/s
Maximum Generating Capacity: 50 kW

Renewable Energy Technologies: Wind

The project economics and wind turbine pros and cons are presented in the following tables:

Wind Turbine Economics

	Building Integrated	Ground Mount 5 kW	Ground Mount 50 kW
Gross Installation Cost Estimate	$130,000	$62,400	$250,000
NJJ SSB Rebate	$39,643	$31,858	$88,114
Net Installation Cost Estimate	$90,357	$30,542	$161,886
Annual Energy Savings	$2,072	$1,665	$15,025
Simple Payback	44 yrs.	18 yrs.	11 yrs.
System Capacity	20 kW	10 kW	50 kW
Annual Avoided Energy Use	12,388 kWh	9,956 kWh	89,827 kWh
Annual Avoided CO_2 Emissions, Tons	4	3	31
% of Annual Electric Use*	0.6%	0.4%	4.0%

Lakeland Regional High School: 2,246,000 kWh/Year.

Wind Turbine Pros & Cons

Pros	Cons
➢Annual reduction in energy spend and use can be potentially reduced by almost $15,000 (4% reduction). ➢Typical equipment life span is 15-30 years. ➢Reduction of annual greenhouse gas emissions by 31 tons per year. ➢A wind turbine project could be incorporated into science and other curriculums to raise student awareness of energy alternatives. ➢High visible “green” project.	➢Payback period is significant (more than 10 years). ➢Average area wind speed is not ideal and impacts performance. ➢Prone to lighting strikes. ➢Bird collisions are likely, but may be reduced with avian guard (building integrated only). ➢Zoning may be an issue. Check with local zoning regulations. ➢Wind turbines do create noise, although below 50 dB (a typical car ride is over 80 dB).

Of the three wind turbine technologies considered, the 50 kilowatt ground mounted wind turbine appears to be the most attractive option. Should Lakeland R.H.S. decide to pursue a wind turbine project, Dome-Tech recommends commissioning a more detailed study.

Renewable Energy Technologies: Solar Photovoltaic

Solar Photovoltaic

- Sunlight can be converted into electricity using photovoltaics (PV).
- A solar cell or photovoltaic cell is a device that converts sunlight directly into electricity.
- Photons in sunlight hit the solar panel and are absorbed by semiconducting materials, such as silicon. Electrons are knocked loose from their atoms, allowing them to flow through the material to produce electricity.
- Solar cells are often electrically connected and encapsulated as a module, in series, creating an additive voltage. The modules are connected in an array. The power output of an array is measured in watts or kilowatts, and typical energy needs are measured in kilowatt-hours.

Renewable Energy Technologies: Solar Photovoltaic (Cont.)

Solar Photovoltaic Systems

System Capacity, kw-dc (maximum utilization of roof space)	380 kw dc
Annual Electric Generation, kwhrs of AC electricity produced	400,551 kwh
Total Annual Facility Electric Use, kwhrs	2,250,937 kwh
% of Total Annual Usage	18%
All-In Cost of Electric Year 1	$0.167 / kwh
Annual Electric Cost Savings	$66,892
Estimated SREC Value (Year 1):	$640 / SREC
Estimated Year 1 SREC Revenue:	$256,220
Equivalent Annual CO2 Emission Reduction (tons per year)[1]	220 tons/yr
Equivalent Cars Removed From Road Annually[2]	38
Equivalent Acres of Trees Planted Annually[3]	60
System Installed Cost (does not include value of tax credits)	$2,660,203
Simple Payback (includes tax incentives)	9.6
IRR (25 Years)	7%

1. Estimated CO_2 Emissions Rate: 1.096 lbs/kWh
2. EPA Estimate: 11,560 lbs CO_2 per car
3. EPA Estimate: 7,333 lbs CO_2 per acre of trees planted

Renewable Energy Technologies: Solar Photovoltaic (Cont.)

Non-Financial Benefits of Solar PV

- The implementation of solar PV projects at Lakeland Regional HS places the district at the forefront of renewable energy utilization. This allows the district the opportunity to not only gain experience with this energy technology, but also to win recognition as an environmentally sensitive, socially conscience institution. Additionally, these projects could be incorporated into science education and additional curriculums to raise awareness of current energy alternatives to the younger generations.

Renewable Energy Technologies: CHP/Cogeneration

- CHP (combined heat and power) or cogeneration is the use of a heat engine to simultaneously generate both electricity and useful heat.
- Fuel Cells are electrochemical conversion devices that operate by catalysis, separation the protons and the electrons of the reactant fuel, and forcing the electrons to travel through a circuit to produce electricity. The catalyst is typically a platinum group metal or alloy. Another catalytic process takes the electrons back in, combining them with the protons and oxidant, producing waste products (usually water and carbon dioxide).
- Microturbines are rotary engines that extract energy from a flow of combustion gas. They can be used with absorption chillers to provide cooling through waste heat rather than electricity. Microturbines are best suited for facilities with year-round thermal and/or cooling loads.
- Not recommended for Lakeland Regional High School due to the lack of thermal requirements in the summertime.

Utility Tariff and Rate Review: Electricity

- **Accounts and Rate Class:** The High School is served by three electric accounts behind Jersey Central Power & Light under rate class General Service (GS).

- **Electric Consumption and Cost:** Based on the one-year period studied, the total annual electric expenditure for the High School is about $375,665 and the total annual consumption is about 2,246,000 kilowatt-hours (kWh).

- **Average/Effective Rate per kWh:** For the one year period studied, the High School's average monthly cost per kilowatt-hour ranged from 14.28 ¢/kWh to 19.82 ¢/kWh, inclusive of utility delivery charges. The Township's overall, average cost per kilowatt-hour during this period was 17.00 ¢/kWh.

  - Note that these average electric rates are "all–inclusive"; that is, they include all supply service (generation and commodity-related) charges, as well as all delivery service charges. The supply service charges typically represent the majority (60-80%) of the total monthly bill. It is the supply portion of your bill that is deregulated, which is discussed on subsequent slides in this section.

Utility Tariff and Rate Review: Natural Gas

- **Accounts and Rate Class:** The High School is served by four natural gas accounts behind Public Service Electric and Gas Company under rate class Basic Gas Supply Service-General Service (BGSS-GSG).

- **Natural Gas Consumption and Cost:** Based on the one-year period studied, the total annual natural gas expenditure for the High School is about $174,000 and the total annual consumption is about 110,000 therms (th). Natural gas is used predominantly throughout the winter period for heating purposes.

  - Retail Energy Supplier: For the one-year period studied, the High School was supplied with natural gas from Hess Corporation at various rates between $1.20 and $1.59 per therm.

- **Average/Effective Rate per Therm:** For the one year period studied, the High School's average cost per therm ranged from $1.19 to $2.00 per therm, inclusive of utility delivery charges. The High School's overall, average cost per therm during this period was $1.58 per therm.

  - Note that these average natural gas rates are "all–inclusive"; that is, they include all supply service (interstate transportation and commodity-related) charges, as well as all delivery service charges. The supply service charges typically represent the majority (60-80%) of the total monthly bill. It is the supply portion of your bill that is deregulated, which is discussed on subsequent slides in this section.

Utility Deregulation in New Jersey: Background and Retail Energy Purchasing

- In August 2003, per the Electric Discount and Energy Competition Act [N.J.S.A 48:3-49], the State of New Jersey deregulated its electric marketplace thus making it possible for customers to shop for a third-party (someone other than the utility) supplier of retail electricity.
- Per this process, every single electric account for every customer in New Jersey was placed into one of two categories: BGS-FP or BGS-CIEP. BGS-FP stands for Basic Generation Service-Fixed Price; BGS-CIEP stands for Basic Generation Service-Commercial and Industrial Energy Pricing.
- At its first pass, this categorization of accounts was based on rate class. The largest electric accounts in the State (those served under a Primary or a Transmission-level rate class) were moved into BGS-CIEP pricing. All other accounts (the vast majority of accounts in the State of New Jersey, including residential) were placed in the BGS-FP category, receiving default electric supply service from the utility.
- The New Jersey Board of Public Utilities (NJBPU) has continued to move new large energy users from the BGS-FP category into the BGS-CIEP category by lowering the demand (kW) threshold for electric accounts receiving Secondary service. Several years ago, this threshold started at 1,500kW; now, it has come down to 1,000 kW. So, if an account's "peak load share" (as assigned by the utility) is less than 1,000 kW, then that facility/account is in the BGS-FP category. If you are unsure, you may contact Dome-tech for assistance.

Utility Deregulation in New Jersey: Background and Retail Energy Purchasing (cont.)

- There are at least 3 important differentiating factors to note about each rate category:
  1. The rate structure for BGS-FP accounts and for BGS-CIEP accounts varies.
  2. The "do-nothing" option (ie, what happens when you don't shop for retail energy) varies.
  3. The decision about whether, and why, to shop for a retail provider varies.

- Secondary (small to medium) Electric Accounts:
  - BGS-FP rate schedules for all utilities are set, and re-set, each year. Per the results of our State's BGS Auction process, held each February, new utility default rates go into effect every year on June 1st. The BGS-FP rates become each customer's default rates, and they dictate a customer's "Price to Compare" (benchmark) for shopping purposes. To learn more about the BGS Auction process, please go to www.bgs-auction.com.
  - A customer's decision about whether to buy energy from a retail energy supplier is, therefore, dependent upon whether a supplier can offer rates that are lower than the utility's (default) Price to Compare. In 2009, and for the first time in several years, many BGS-FP customers have "switched" from the utility to a retail energy supplier because there have been savings.

- Primary (large) Electric Accounts:
  - The BGS-CIEP category is quite different. There are two main features to note about BGS-CIEP accounts that do not switch to a retail supplier for service. The first is that they pay an hourly market rate for energy; the second is that these accounts also pay a "retail margin adder" of $0.0053/kWh. For these large accounts, this retail adder can amount to tens of thousands of dollars. The adder is eliminated when a customer switches to a retail supplier for service.
  - For BGS-CIEP accounts, the retail adder makes a customer's decision about *whether* to switch relatively simple. However, the process of setting forth a buying strategy can be complex, which is why many public entities seek professional assistance when shopping for energy.

Utility Deregulation in New Jersey: Background and Retail Energy Purchasing (cont.)

- For more information concerning hourly electric market prices for our region, please refer to www.pjm.com.

- Natural Gas Accounts:
  - The natural gas market in New Jersey is also deregulated. Unlike the electric market, there are no "penalties", or "adders", for not shopping for natural gas. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. While natural gas is a commodity that is exceptionally volatile and that is traded minute-by-minute during open trading sessions, market rates are "settled" each month, 3 business days prior to the subsequent month (this is called the "prompt month"). Customers that do not shop for a natural gas supplier will typically pay this monthly settlement rate to the utility, plus other costs that are necessary to bring gas from Louisiana up to New Jersey and ultimately to your facility.
  - For additional information about natural gas trading and current market futures rates for various commodities, you can refer to www.nymex.com.
  - A customer's decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by enlisting a retail natural gas supplier. Many larger natural gas customers also seek the assistance of a professional consultant to assist in their procurement process.

Retail Energy Purchasing: Recommendations and Resources

- Electric
  - Based on current and recent market conditions, and actual bid processes run by Dome-Tech for various clients during the summer of 2009, we have seen customers with BGS-FP accounts save approximately 10-20% in projected energy costs by switching to retail energy supplier. If the High School were able to secure this type of agreement, this would represent an annual savings of approximately $17,000 - $34,000. It is important to note that actual rates and potential savings will be dependent on several factors, including market conditions, account usage characteristics/load profile (load factor), volume, and contract term.

- Natural Gas
  - Based on current and recent market conditions, and actual bid processes run by Dome-Tech for various clients during the summer of 2009, we have seen many customers entering into longer-term contracts for fixed natural gas rates. These rates vary substantially based on load type, volume, and term.
  - The High School is currently supplied natural gas from Hess under a third-party retail energy contract.

- Energy Purchasing Co-Operatives
  - Many public entities participate in various energy aggregation buying groups. Sometimes, an entity will have multiple options to choose from. These might include purchasing through a County co-operative, or purchasing through a trade-type association (for instance, many schools participate in NJASBO's ACES program). Co-operative purchasing may not necessarily get you the lowest rates; however, there is often substantial volume, and it can represent a good alternative for entities with limited energy consumption who can have a difficult time getting energy suppliers to respond to them on a direct, singular basis.

Retail Energy Purchasing: Recommendations and Resources (cont.)

- To determine whether a savings opportunity currently exists for your entity, or for guidance on how to get started, you may contact Dome-Tech to discuss. There is also additional information provided below.
- To learn more about energy deregulation, visit the New Jersey Board of Public Utilities website: www.bpu.state.nj.us
- For more information about the retail energy supply companies that are licensed and registered to serve customers in New Jersey, visit the following website for more information: http://www.bpu.state.nj.us/bpu/commercial/shopping.html
- Provided below is a list of NJ BPU-licensed retail energy suppliers:

Company	Electricity	Natural Gas	Website
Pepco	X	X	www.pepcoenergy.com
Hess	X	X	www.hess.com
Sprague	X	X	www.spragueenergy.com
UGI	X	X	www.gasmark.com
South Jersey Energy	X	X	www.sjindutries.com
Direct	X	X	www.directenergy.com
Global	X	X	www.globalp.com
Liberty	X		www.libertypowercorp.com
ConEd Solutions	X		www.conedsolutions.com
Constellation	X		www.constellation.com
Glacial	X		www.glacialenergy.com
Integrys	X		www.intergryenergy.com
Suez	X		www.suezenergyna.com
Sempra	X		www.semprasolutions.com
Woodruff		X	www.woodruffenergy.com
Mx Energy		X	www.mxenergy.com
Hudson		X	www.hudsonenergy.net
Great Eastern		X	www.greateasterngas.com

**Note: Not every Supplier serves customers in all utility territories within New Jersey*

Historical Energy Futures Settlement Prices

- Below please find graphs that show the last several years' worth of market settlement prices for both natural gas and electricity. Each of these graphs shows the average closing prices of a rolling 12-month period of energy futures prices. The graphs are representative of the commodity, alone; they do not include any of the additional components (capacity, transmission, ancillary services, etc.) that comprise a retail energy price. They are meant to provide an indication of the level of pricing that a particular customer might expect to see, but the graphs do not account for the specific load profile of any individual energy user.

Henry Hub 12 month strip

PJM West 12 month strip

Operations & Maintenance

- The pneumatic controls for the new building are obsolete. The operating staff has been doing an outstanding job of maintaining the systems but replacement parts are becoming more difficult to locate. As time goes by, maintaining this control system will become more difficult if not impossible. The planning process to replace this system with a modern digital system should start soon to avoid emergency outages.
- The air compressor serving the pneumatic control system demonstrated significant cycling. Dome-Tech observed it running one minute out of four while maintaining between 58 and 78 psi. This is indicative of an air leak problem somewhere in the system. Operators should consider an air leak survey and repair program by a qualified contractor. Dome-tech can perform this service and can supply a scope of work and price upon request from the school. This also supports Dome-Tech's previous comments about the pneumatic control system becoming more difficult and costly to maintain.
- There is no lightning protection on any of the roofs or roof mounted equipment. This could lead to the buildings or roof mounted equipment suffering catastrophic damage. It is also a safety risk for anyone working on the roof.
- Many RTUs and AHUs were observed to be drawing air into the units through the drain tubes. This indicates the traps in the drains are not full of water. Operators should implement a drain trap maintenance program to ensure the traps are filled with water during the cooling season to prevent unconditioned air from being drawn into the units.

Operations & Maintenance (cont.)

- Multiple RTUs and exhaust fans were observed to have worn and cracked belts. Operators should implement a preventative maintenance program to avoid costly equipment outages and/or emergency repairs performed during off-hours.
- The insulation on the refrigerant lines on many of the roof mounted split system condenser coils had been damaged or completely destroyed by exposure to the sun. These lines should have new insulation applied and the insulation should be painted to prevent further sun damage.
- Some of the roof mounted split system condenser coils are sitting on wood 4 x 4's. These should be replaced with non-biodegradable components.
- Many of the 3-way HHW valves (Heating Hot Water) on the Main building heating coils were displaying signs of corrosion damage either from the use of dissimilar metals in the valves construction or chemicals used for HHW treatment. These valves should be more closely examined to determine if they need repair or replacement and the overall cause of the corrosion needs to determined and corrected.

- HV-5 (Heating Ventilator) in the main building has a centrifugal pump installed to circulate water through the HHW coil should temperatures drop below freezing. When the pump is not operating (which is almost all the time) water can travel through the pump and bypass the HHW coil. A normally closed solenoid valve should be installed in the pump line to prevent this from happening when the pump is not operating.

Operations & Maintenance (cont.)

- HVAC-1 in the main building is equipped with a smoke alarm on its return and another on its supply. The unit next to it (tagged HV-2) has no smoke alarm. Operators should verify that the return smoke alarm was installed correctly and not intended for HV-2.
- HVAC-1 also had significant air leakage around the inlets to both its CHW and HHW coils.
- The guard on the supply fan belt for HVAC-6 was missing. This is a safety hazard particularly so because the belt is located in a very dark area of the fan room.
- The supply fan for HV-10 is missing.
- One of the walk-in freezer boxes in the cafeteria was experiencing a significant ice build-up on the interior walls and evaporator coils. Cafeteria personnel informed Dome-Tech that a refrigeration technician was investigating and felt the door seal may have been malfunctioning.
  - Ice build-up is indicative of wet outside air somehow finding its way into the freezer compartment. A door seal can cause this but it could also be a sign of a larger problem.
  - It may be an indication that the insulation in the box's walls has failed (probably from moist air leaking into the panels somehow over a long period and wetting the insulation.)
  - A unit with wet insulation will consume a good deal more energy and experience significantly higher operating costs as the insulation allows heat to enter the compartment and the compressor runs longer to remove it.
  - If replacing the door seal does not correct the problem Lakeside RHS should instruct the repair crew to investigate the wall panels to see if water has entered the insulation and the panels need to be replaced.

ECM Funding Sources

State of New Jersey has generous subsidies or rebates for many areas of improving Energy Efficiency or Equipment upgrades. www.njcleanenergy.com

Clean Energy Solutions Capital Investment Loan/Grant

The EDA offers up to $5 million in interest-free loans and grants to ensure that commercial, industrial, and institutional entities "going green" in New Jersey. Under this program, scoring criteria based on the project's environmental and economic development impact determines the percentage split of loan and grant awarded. Funding can be used to purchase fixed assets, including real estate and equipment, for an end-use energy efficiency project, combined heat and power (CHP or cogen) production facility, or new state-of-the-art efficient electric generation facility, including Class I and Class II renewable Energy.
http://www.njeda.com/web/Aspx_pg/Templates/Npic_Text.aspx?Doc_Id=1078&menuid=1360&topid=722&levelid=6&midid=1357

NJ Smart Start Buildings

Equipment Rebates - Water Heaters, Lighting, Lighting Controls/Sensors, Chillers, Boilers, Heat pumps, Air conditioners, Energy Mgmt. Systems/Building Controls, Motors, Motor-ASDs/VSDs, Custom/Others
http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings

Renewable funding for PV & wind, plus federal credits right now. See:

http://www.njcleanenergy.com/renewable-energy/programs/renewable-energy-incentive-program/applications-and-e-forms-renewable-ener

Your current utility provider may also offer incentives, depending on your capacity and the current programs/ funds available to you, these change frequently so you should check with them when getting ready to start a project and apply for funding.

Next Steps

The following projects should be considered for further study and implementation:

- Temperature set-point optimization
- Lighting upgrades
- High efficiency, modular, condensing boilers
- Implement economizer and demand control ventilation in New building
- Install Solar Photovoltaic System
- Energy awareness program
- Compressed Air Leak Survey
- Consider Third Party Electric Supply
- The Ground Source Heat Pump screening indicated a payback of 9 years on the incremental costs. Lakeland should consider a detailed engineering analysis to determine if GSHP is an attractive alternative when replacing its boilers and chillers.

Summary Energy Performance Report

Facilities included: Lakeland HS Group

Number of facilities: 1

	Year ending 1/2009
Total Floorspace (sq. ft.)	204,337
Average Rating	26
Number of Facilities with a Rating	1
Number of Non-ratable Facilities*	0
Total Site Energy Use (kBtu)	17,969,540
Total Weather Normalized Source Energy Use (kBtu)	35,620,751
Average Weather Normalized Source Energy Intensity (kBtu/Sq. Ft.)	174.3
Average Site Energy Intensity (kBtu/Sq. Ft.)	87.9
Total Site Electric Use (kWh)	2,219,804
Total Site Natural Gas Use (Therms)	103,956
Average Actual Annual Source Energy Intensity (kBtu/Sq. Ft.)	177.1

*Non-ratable buildings are defined as buildings that currently are ineligible to receive the ENERGY STAR rating due to its operating characterisitcs and/or building type.

Summary Energy Performance Report

Facilities included: Lakeland HS Group

Facility Name	Facility Address	Year ending 1/2009 Facility Floorspace	Year ending 1/2009 Rating	Year ending 1/2009 Average Site Energy Intensity (kBtu/Sq. Ft.)	Year ending 1/2009 Average Weather Normalized Source Energy Intensity (kBtu/Sq. Ft.)	Year ending 1/2009 Site Electric Use (kWh)	Year ending 1/2009 Site Natural Gas Use (Therms)
Lakeland Regional High School	205 Conklintown Road Wanaque, NJ 07465	204337	26	87.9	174.3	2,219,804	103,956

Facility Name Lakeland Regional HS
Company HESS
Account# 3178742751-2118630
Meter# Hess 397539/404590
Tariff/Rate FTLV Pool

Energy Type	Energy Unit	Start Date	End Date	Demand	Therms	Cost	$/Therm
Natural Gas	MBTu	2/27/2008	3/28/2008	NA	17010	241.37	$ 0.0142
Natural Gas	MBTu	3/29/2008	4/28/2008	NA	8350	118.49	$ 0.0142
Natural Gas	MBTu	4/29/2008	5/28/2008	NA	4690	66.55	$ 0.0142
Natural Gas	MBTu	5/29/2008	6/28/2008	NA	120	1.7	$ 0.0142
Natural Gas	MBTu	6/29/2008	7/28/2008	NA	1020	16.26	$ 0.0159
Natural Gas	MBTu	7/29/2008	8/26/2008	NA	1150	15.51	$ 0.0135
Natural Gas	MBTu	8/27/2008	9/24/2008	NA	1260	15.86	$ 0.0126
Natural Gas	MBTu	9/25/2008	10/23/2008	NA	3450	42.1	$ 0.0122
Natural Gas	MBTu	10/24/2008	11/24/2008	NA	12350	148.35	$ 0.0120
Natural Gas	MBTu	11/25/2008	12/23/2008	NA	20780	248.81	$ 0.0120
Natural Gas	MBTu	12/24/2008	1/19/2009	NA	21830	261.38	$ 0.0120
Natural Gas	MBTu	1/20/2009	2/17/2009	NA	22710	271.91	$ 0.0120
			TOTALS	**NA**	**114720**	**1448.29**	**0.1588873**

Facility Name Lakeland Regional HS
Company HESS
Account# 3178742751-3166447
Meter# Hess 397539/404589
Tariff/Rate FTLV Pool

Energy Type	Energy Unit	Start Date	End Date	Demand	Therms	Cost	$/Therm
Natural Gas	MBTu	2/27/2008	3/28/2008	NA	20970	297.56	$ 0.01
Natural Gas	MBTu	3/29/2008	4/28/2008	NA	19830	281.39	$ 0.01
Natural Gas	MBTu	4/29/2008	5/28/2008	NA	21160	300.26	$ 0.01
Natural Gas	MBTu	5/29/2008	6/28/2008	NA	1730	24.55	$ 0.01
Natural Gas	MBTu	6/29/2008	7/28/2008	NA	14430	229.96	$ 0.02
Natural Gas	MBTu	7/29/2008	8/26/2008	NA	14050	189.36	$ 0.01
Natural Gas	MBTu	8/27/2008	9/24/2008	NA	11720	147.55	$ 0.01
Natural Gas	MBTu	9/25/2008	10/23/2008	NA	16200	197.7	$ 0.01
Natural Gas	MBTu	10/24/2008	11/24/2008	NA	19670	236.28	$ 0.01
Natural Gas	MBTu	11/25/2008	12/23/2008	NA	28930	346.39	$ 0.01
Natural Gas	MBTu	12/24/2008	1/19/2009	NA	27370	327.71	$ 0.01
Natural Gas	MBTu	1/20/2009	2/17/2009	NA	31490	377.04	$ 0.01
			TOTALS	**NA**	**227550**	**2955.75**	**0.1589**

Facility Name Lakeland Regional HS
Company HESS
Account# 3178742751-3166872
Meter# Hess 397539/3166872
Tariff/Rate FTLV Pool

Energy Type	Energy Unit	Start Date	End Date	Demand	Therms	Cost	$/Therm
Natural Gas	MBTu	2/27/2008	3/28/2008	NA	34530	489.98	$ 0.01
Natural Gas	MBTu	3/29/2008	4/28/2008	NA	28170	399.73	$ 0.01
Natural Gas	MBTu	4/29/2008	5/28/2008	NA	29400	417.19	$ 0.01
Natural Gas	MBTu	5/29/2008	6/28/2008	NA	2230	31.64	$ 0.01
Natural Gas	MBTu	6/29/2008	7/28/2008	NA	18610	296.58	$ 0.02
Natural Gas	MBTu	7/29/2008	8/26/2008	NA	16990	229.02	$ 0.01
Natural Gas	MBTu	8/27/2008	9/24/2008	NA	17470	219.89	$ 0.01
Natural Gas	MBTu	9/25/2008	10/23/2008	NA	12020	146.47	$ 0.01
Natural Gas	MBTu	10/24/2008	11/24/2008	NA	38510	395.24	$ 0.01
Natural Gas	MBTu	11/25/2008	12/23/2008	NA	25380	303.88	$ 0.01
Natural Gas	MBTu	12/24/2008	1/19/2009	NA	17750	212.53	$ 0.01
Natural Gas	MBTu	1/20/2009	2/17/2009	NA	29720	355.85	$ 0.01
			TOTALS	**NA**	**270780**	**3498**	**0.1571304**

Facility Name Lakeland Regional HS
Company HESS
Account# 3178742751-2933961
Meter# Hess 397539/397651
Tariff/Rate FTLV Pool

Energy Type	Energy Unit	Start Date	End Date	Demand	Therms	Cost	$/Therm
Natural Gas	MBTu	2/27/2008	3/28/2008	NA	895050	12700.76	$ 0.01
Natural Gas	MBTu	3/29/2008	4/28/2008	NA	333890	4737.9	$ 0.01
Natural Gas	MBTu	4/29/2008	5/28/2008	NA	47820	678.57	$ 0.01
Natural Gas	MBTu	5/29/2008	6/28/2008	NA	0	0	$ -
Natural Gas	MBTu	6/29/2008	7/28/2008	NA	0	0	$ -
Natural Gas	MBTu	7/29/2008	8/26/2008	NA	0	0	$ -
Natural Gas	MBTu	8/27/2008	9/24/2008	NA	2600	32.73	$ 0.01
Natural Gas	MBTu	9/25/2008	10/23/2008	NA	165700	2022.15	$ 0.01
Natural Gas	MBTu	10/24/2008	11/24/2008	NA	728130	8746.26	$ 0.01
Natural Gas	MBTu	11/25/2008	12/23/2008	NA	973860	11660.32	$ 0.01
Natural Gas	MBTu	12/24/2008	1/19/2009	NA	977500	11703.9	$ 0.01
Natural Gas	MBTu	1/20/2009	2/17/2009	NA	1260320	15090.19	$ 0.01
			TOTALS	**NA**	**5384870**	**67372.78**	**$ 0.01**

Facility Name Lakeland Regional HS
Company HESS
Account# 3178742751-2348972
Meter# Hess 397539/404591
Tariff/Rate FTLV Pool

Energy Type	Energy Unit	Start Date	End Date	Demand	Therms	Cost	$/Therm
Natural Gas	MBTu	2/27/2008	3/28/2008	NA	937410	13301.85	$ 0.01
Natural Gas	MBTu	3/29/2008	4/28/2008	NA	433250	6147.82	$ 0.01
Natural Gas	MBTu	4/29/2008	5/28/2008	NA	131720	1869.11	$ 0.01
Natural Gas	MBTu	5/29/2008	6/28/2008	NA	0	0	$ -
Natural Gas	MBTu	6/29/2008	7/28/2008	NA	0	0	$ -
Natural Gas	MBTu	7/29/2008	8/26/2008	NA	2090	28.19	$ 0.01
Natural Gas	MBTu	8/27/2008	9/24/2008	NA	5100	64.21	$ 0.01
Natural Gas	MBTu	9/25/2008	10/23/2008	NA	88110	1075.27	$ 0.01
Natural Gas	MBTu	10/24/2008	11/24/2008	NA	572990	6882.73	$ 0.01
Natural Gas	MBTu	11/25/2008	12/23/2008	NA	830130	9939.4	$ 0.01
Natural Gas	MBTu	12/24/2008	1/19/2009	NA	1000350	11977.49	$ 0.01
Natural Gas	MBTu	1/20/2009	2/17/2009	NA	1034680	12388.53	$ 0.01
			TOTALS	**NA**	**5035830**	**63674.6**	**$ 0.01**

Facility Name Lakeland Regional HS
Company JCP&L
Account# 100007 0944-18
100007 0944-18
Meter# meterG16567377
Tariff/Rate JC_GS3_01F

Energy Type	Energy Unit	Start Date	End Date	Demand KW	KWH	Cost	$/kWh
Electricity	kWh	1/3/2009	2/3/2009	238	85,120	$13,901.93	$ 0.16
Electricity	kWh	12/5/2008	1/2/2009	225	70,400	$11,608.42	$ 0.16
Electricity	kWh	11/4/2008	12/4/2008	228	77,120	$12,099.06	$ 0.16
Electricity	kWh	10/3/2008	11/3/2008	240	72,640	$11,396.21	$ 0.16
Electricity	kWh	9/4/2008	10/2/2008	266	74,240	$11,806.65	$ 0.16
Electricity	kWh	8/5/2008	9/3/2008	231	48,000	$9,260.60	$ 0.19
Electricity	kWh	7/4/2008	8/4/2008	150	46,400	$8,468.93	$ 0.18
Electricity	kWh	6/4/2008	7/3/2008	260	69,760	$12,975.75	$ 0.19
Electricity	kWh	5/3/2008	6/3/2008	224	69,760	$11,842.65	$ 0.17
Electricity	kWh	4/4/2008	5/2/2008	215	64,320	$9,503.93	$ 0.15
Electricity	kWh	3/4/2008	4/3/2008	232	82,560	$11,916.70	$ 0.14
Electricity	kWh	1/31/2008	3/3/2008	251	90,560	$13,668.13	$ 0.15
			TOTALS	**2760**	**850880**	**138448.96**	**$ 0.16**

Facility Name Lakeland Regional HS
Company JCP&L
Account# 100007 0945-74
100007 0945-74
Meter# meter#G21163222
Tariff/Rate JC_GS3_01F

Energy Type	Energy Unit	Start Date	End Date	Demand KW	KWH	Cost	$/kWh
Electricity	kWh	1/3/2009	2/3/2009	325	118,200	$19,268.42	$ 0.16
Electricity	kWh	12/5/2008	1/2/2009	312	101,000	$16,584.15	$ 0.16
Electricity	kWh	11/4/2008	12/4/2008	320	110,200	$17,254.52	$ 0.16
Electricity	kWh	10/3/2008	11/3/2008	322	127,600	$19,479.03	$ 0.15
Electricity	kWh	9/4/2008	10/2/2008	514	129,200	$20,875.90	$ 0.16
Electricity	kWh	8/5/2008	9/3/2008	485	87,200	$17,279.82	$ 0.20
Electricity	kWh	7/4/2008	8/4/2008	425	112,600	$20,978.04	$ 0.19
Electricity	kWh	6/4/2008	7/3/2008	556	121,600	$23,328.34	$ 0.19
Electricity	kWh	5/3/2008	6/3/2008	463	102,600	$18,340.89	$ 0.18
Electricity	kWh	4/4/2008	5/2/2008	305	88,600	$13,147.70	$ 0.15
Electricity	kWh	3/4/2008	4/3/2008	311	121,200	$17,301.35	$ 0.14
Electricity	kWh	1/31/2008	3/3/2008	329	141,800	$20,989.10	$ 0.15
			TOTALS	**4667**	**1361800**	**224827.26**	**$ 0.17**

Facility Name Lakeland Regional HS
Company JCP&L
Account# 100044 9034-56
100044 9034-56
Meter# meter#G21057368
Tariff/Rate JC_GS1_01F

Energy Type	Energy Unit	Start Date	End Date	Demand KW	KWH	Cost	$/kWh
Electricity	kWh	1/3/2009	2/3/2009	140	360	$486.46	$ 1.35
Electricity	kWh	12/5/2008	1/2/2009	140	1,560	$692.71	$ 0.44
Electricity	kWh	11/4/2008	12/4/2008	140	8,360	$2,051.21	$ 0.25
Electricity	kWh	10/3/2008	11/3/2008	137	7,800	$1,939.00	$ 0.25
Electricity	kWh	9/4/2008	10/2/2008	139	6,120	$1,724.24	$ 0.28
Electricity	kWh	8/5/2008	9/3/2008	138	1,760	$1,228.57	$ 0.70
Electricity	kWh	7/4/2008	8/4/2008	153	1,080	$686.38	$ 0.64
Electricity	kWh	6/4/2008	7/3/2008	100	1,600	$943.87	$ 0.59
Electricity	kWh	5/3/2008	6/3/2008	153	1,440	$726.11	$ 0.50
Electricity	kWh	4/4/2008	5/2/2008	153	920	$620.66	$ 0.67
Electricity	kWh	3/4/2008	4/3/2008	153	360	$520.67	$ 1.45
Electricity	kWh	1/31/2008	3/3/2008	153	1,960	$769.35	$ 0.39
			TOTALS	**1700**	**33320.00**	**$ 12,389**	**$0.626**

Facility Name Lakeland Regional HS
Company PSE&G
Account# 3178742751
Meter# 3178742751 PSEG Combined GSGH
Tariff/Rate GSGH

Energy Type	Energy Unit	Start Date	End Date	Demand	Therms	Cost	$/Therm
Natural Gas	therms	1/19/2009	2/25/2009	NA	839	$318.84	$ 0.38
Natural Gas	therms	12/24/2008	1/19/2009	NA	669	$252.96	$ 0.38
Natural Gas	therms	11/24/2008	12/24/2008	NA	751	$280.83	$ 0.37
Natural Gas	therms	10/23/2008	11/24/2008	NA	705	$257.26	$ 0.36
Natural Gas	therms	9/25/2008	10/23/2008	NA	317	$105.15	$ 0.33
Natural Gas	therms	8/26/2008	9/25/2008	NA	305	$101.29	$ 0.33
Natural Gas	therms	7/28/2008	8/26/2008	NA	322	$106.49	$ 0.33
Natural Gas	therms	6/25/2008	7/28/2008	NA	340	$111.86	$ 0.33
Natural Gas	therms	5/28/2008	6/25/2008	NA	382	$124.38	$ 0.33
Natural Gas	therms	4/28/2008	5/28/2008	NA	552	$175.88	$ 0.32
Natural Gas	therms	3/28/2008	4/28/2008	NA	563	$178.96	$ 0.32
Natural Gas	therms	2/26/2008	3/28/2008	NA	725	$260.73	$ 0.36
			TOTALS	**0.00**	**6470.00**	**2274.63**	**0.35**

Facility Name Lakeland Regional HS
Company PSE&G
Account# 3178742751
Meter# 3178742751 PSEG Combined LVG
Tariff/Rate LVG

Energy Type	Energy Unit	Start Date	End Date	Demand	Therms	Cost	$/Therm
Natural Gas	therms	1/19/2009	2/17/2009	791.38	22,950	$7,236.55	$ 0.32
Natural Gas	therms	12/23/2008	1/19/2009	788.82	19,779	$6,624.74	$ 0.33
Natural Gas	therms	11/24/2008	12/23/2008	788.82	18,040	$6,245.48	$ 0.35
Natural Gas	therms	10/27/2008	11/24/2008	788.82	13,011	$5,233.45	$ 0.40
Natural Gas	therms	9/24/2008	10/27/2008	NA	2,538	$324.80	$ 0.13
Natural Gas	therms	8/26/2008	9/24/2008	NA	77	$100.02	$ 1.30
Natural Gas	therms	7/28/2008	8/26/2008	NA	21	$94.09	$ 4.48
Natural Gas	therms	6/25/2008	7/28/2008	NA	0	$91.89	0 Rate
Natural Gas	therms	5/28/2008	6/25/2008	NA	0	$91.89	0 Rate
Natural Gas	therms	4/28/2008	5/28/2008	NA	1,795	$263.40	$ 0.15
Natural Gas	therms	3/28/2008	4/28/2008	NA	7,671	$750.10	$ 0.10
Natural Gas	therms	2/26/2008	3/28/2008	788.82	18,325	$6,156.26	$ 0.34
			TOTALS	**3946.64**	**104207.00**	**33212.67**	**0.79**

AHUs

Bldg	Tag#	Location	Area Serving	Equipment	Mfg	Model	Quantity	Cooling Technology	Supply Air CFM	Static Pressure w.c.	Fan HP	Cooling Capacity (Tons)	Heating Technology	Heating Capacity (MBH)	Heating GPM	Age	Estimated Service Life	Controls	Notes:
Main Bldg	HV 1	Wood Shop	Wood Shop		Reznor		1	NA	2,330			NA	Nat Gas Direct Fired	NA	NA	10+	25	DDC	gas fired heat in shop
Main Bldg	HV 2		gym				1	NA				NA			NA		25		
Main Bldg	HV 3	Fan Rm C	gym	Custom AHU	Trane	12	1	NA	6,000	1.44"	3	NA	HHW	340	22.7	25+	25	DDC	
Main Bldg	HV 4	Fan Rm C	gym	Custom AHU	Trane	12	1	NA	6,000	1.44"	3	NA	HHW	340	22.7	25+	25	??	HV Schedule shows HV-4 serving gym but HV-4 does not appear in BMS
Main Bldg	HV 5	Fan Rm C	Team Rm Coaches Rm Trainer's Rm	Packaged AHU	Trane	LP12 M2	1	NA	5,625	1.93"	5	NA	HHW	455	30.3	10+	25	DDC	
Main Bldg	HV 6	Storage Rm 146E	Weight Rm	Custom AHU	Trane	6	1	NA	2,965	1.26"	1.5	NA	HHW	240	16	25+	25	DDC	
Main Bldg	HV 7		Cafeteria / Kitchen	Custom AHU	Trane	6	1	NA	2,970	1.26"	1.5	NA	HHW	240	16.1	25+	25	DDC	HV schedule indicates Rm 151 BMS indicates cafeteria / kitchen
Main Bldg	HV 8	Fan Rm D	gym	Custom AHU	Trane	12	1	NA	6,000	1.44"	3	NA	HHW	340	22.7	25+	25	??	This unit does not appear in the BMS Information is from the HVAC Schedule or the fan room where the unit is located
Main Bldg	HV 9	Fan Rm D	gym	Custom AHU	Trane	12	1	NA	6,000	1.44"	3	NA	HHW	325	21.7	25+	25	??	This unit does not appear in the BMS Information is from the HVAC Schedule or the fan room where the unit is located
Main Bldg	HV 10	Fan Rm D	Boys Rm Cafeteria	Custom AHU	Trane	3	1	NA	1,460	1.10"	3/4	NA	HHW	50	3.7	25+	25	DDC	
Main Bldg	HV 11		Sect B hallway	Custom AHU	??	??	1	NA	??	??	??	??	HHW	??	??	??	??	DDC	Unit appears in BMS but is not in HV schedule nor in fan rms
Main Bldg	HV 12													??	??	??	??		HV 12 is not in BMS nor in HV schedule
Main Bldg	HV 13	??	??											??	??	??	??	DDC	Unit appears in BMS but is not in HV schedule nor in fan rms
Main Bldg	HVAC 5	Electric Supply	Electric Supply	Custom AHU	Trane	MP 3	1	CHW (not in use)	3,200	1.61"	2	8	HHW	75	5.0	25+	25	??	This unit does not appear in the BMS nor in the Fan Rms Information is from the HVAC Schedule
Main Bldg	HVAC 8	??	music rm	Custom AHU	Trane	MP 31	1	CHW (not in use)									25	DDC	BMS shows this unit serving the music rm in Main Bldg but there is an HVAC-8 in Fan rm B serving the new bldg?
Main Bldg	HVAC 9	Storage Rm nr Office	Main Office		Trane	BHSC2	1	Dx	550	0.75"	1/3	2	HHW	4	0.7	25+	25	DDC	
Main Bldg	HVAC 10	Fan Rm C	Athletic Director Office		Trane	BHSC2	1	Dx	400	0.75"	1/3	1.5	HHW	10	0.7	25+	25	DDC	This unit does not appear in the BMS Information is from the HVAC Schedule or the fan room where the unit is located
Main Bldg	HVAC 11	146	Office 146		Trane	BHSC2	1	Dx	400	0.70"	1/3	1.5	HHW	10	0.8	25+	25	???	This unit does not appear in the BMS nor in the Fan Rms Information is from the HVAC Schedule
Main Bldg	HVAC 12	Fan Rm D	Lecture Hall Rm 154C Rm 154D	Custom AHU	Trane	MP12 M2	1	CHW (not in use)	6,100	3.46"	7.5	14	HHW	225	15.1	25+	25	DDC	This unit does not appear in the BMS Information is from the HVAC Schedule or the fan room where the unit is located
Main Bldg	HVAC 13	151	Office 151		Trane	BHSC2	1	Dx	400	0.73	1/3	1.5	HHW	10	0.8	25+	25	???	This unit does not appear in the BMS nor in the Fan Rms Information is from the HVAC Schedule
Main Bldg	HVAC 14	Bridge	Bridge		Trane	D36D110	1	Dx	1,000	NA	350 W	2.5	HHW	55	1.5	25+	25	Local Thermostat	This unit does not appear in the BMS nor in the Fan Rms Information is from the HVAC Schedule
Main Bldg	HVAC 15	Bridge	Bridge		Trane	D36D110	1	Dx	1,000	NA	350 W	2.5	HHW	55	1.5	25+	25	Local Thermostat	This unit does not appear in the BMS nor in the Fan Rms Information is from the HVAC Schedule
Main Bldg	HVAC 16	Bridge	Bridge		Trane	D36D110	1	Dx	1,000	NA	350 W	2.5	HHW	55	1.5	25+	25	Local Thermostat	This unit does not appear in the BMS nor in the Fan Rms Information is from the HVAC Schedule
Main Bldg	HVAC 17	Bridge	Bridge		Trane	D36D110	1	Dx	1,000	NA	350 W	2.5	HHW	55	1.5	25+	25	Local Thermostat	This unit does not appear in the BMS nor in the Fan Rms Information is from the HVAC Schedule
Main Bldg	HVAC 18	Bridge	Bridge		Trane	D36D110	1	Dx	1,000	NA	350 W	2.5	HHW	55	1.5	25+	25	Local Thermostat	This unit does not appear in the BMS nor in the Fan Rms Information is from the HVAC Schedule
New Bldg	HVAC 1	Fan Rm A	Rms 410, 411, 415, 416, Nurse's Office	Custom AHU	Trane	MP 17	1	CHW	9,200	3.49"	15	35	HHW	300	19.4	25+	25	Pnu	HVAC-1 also appears in the BMS?
New Bldg	HVAC 2	Fan Rm A	Rms 400, 401, 406, 407	Custom AHU	Trane	MP 17	1	CHW	8,500	3.37"	15	35	HHW	300	20.5	25+	25	Pnu	

New Bldg	HVAC 3	Fan Rm B	Bd of Ed Offices Superintendent's Office Guidance Offices	Custom AHU	Trane	MP 10	1	CHW	5,700	3.88"	7.5	20	HHW	300	16.6	25+	25	Poor	
New Bldg	HVAC 4	Fan Rm B	Rms 403, 404, 405, 412, 413	Custom AHU	Trane	MP 25	1	CHW	12,620	3.44"	15	50	HHW	400	26.9	25+	25	Poor	
New Bldg	HVAC 6	Fan Rm A	Rm 511, storage, offices	Custom AHU	Trane	MP 35	1	CHW	16,000	2.90"	15	45	HHW	575	38.3	25+	25	Poor	
New Bldg	HVAC 7	Fan Rm B	Library	Custom AHU	Trane	MP 31	1	CHW	15,000	3.05"	15	45	HHW	560	37.6	25+	25	Poor	
New Bldg	HVAC 8	Fan Rm B	Rms 505, 506, 508, 510	Custom AHU	Trane	MP 31	1	CHW	14,500	3.05"	15	45	HHW	525	35.2	25+	25	Poor	BMS shows this unit serving the music rm in Main Bldg but there is an HVAC-8 in Fan rm B serving the new bldg?

HVAC Systems

Bldg	Tag#	Location	Area Serving	Equipment	Type	Quantity	Mfg	Model	Tons	[illegible]	[illegible]	Age	Service Life
New Bldg		Roof		AC	split system	1	Mitsubishi	Mr Slim PU[illegible]	3	[illegible]	R-22	15+	15
New Bldg		Roof		AC	split system	1	Mitsubishi	Mr Slim PU[illegible]	3	[illegible]	R-22	15+	15
New Bldg		Roof		AC	split system	1	Sanyo	[illegible]	3	[illegible]	R-22	[illegible]	15
New Bldg		Roof		AC	split system	1	Sanyo	[illegible]	3	[illegible]	R-22	[illegible]	15
New Bldg		Roof		AC	split system	1	Trane	[illegible]	3	[illegible]	R-22	15+	15
New Bldg		Roof		AC	split system	2	Trane	[illegible]	3	[illegible]	R-22	15+	15
New Bldg		Roof		AC	split system	1	Trane	[illegible]	5	[illegible]	R-22	15+	15
New Bldg		Roof		Condenser	[illegible]	1	McQuay	[illegible]	5	[illegible]	R-22	15+	15
New Bldg	RTU-1	Roof	[illegible]	AC	RTU	1	Trane	[illegible]	7.5	[illegible]	R-22	7	15
New Bldg	RTU 2-3	Roof	[illegible]	AC	RTU	2	Trane	[illegible]	7.5	[illegible]	R-22	7	15
New Bldg		Roof		AC	split system	1	Mitsubishi	Mr Slim PU[illegible]	3	[illegible]	R-22	15+	15

Unit Ventilators

Bldg	Tag#	Location	Area Serving	Equipment	Quantity	Mfg	Model	Supply Air rate	Fans?	Age	Estimated Service Life	Notes
	New Bldg			Unit Ventilator	25	Nesbitt	[illegible]	1,000	[illegible]		20	Data from Drawing Schedules. Counts confirmed with BMS or Fan Rm data
	New Bldg			Unit Ventilator	4	Nesbitt	[illegible]	1,500	[illegible]		20	Data from Drawing Schedules. Counts confirmed with BMS or Fan Rm data
	New Bldg			Unit Ventilator	1	Nesbitt	[illegible]	750	[illegible]		20	Data from Drawing Schedules. Counts confirmed with BMS or Fan Rm data
	New Bldg			Unit Ventilator	[illegible]	Trane	[illegible]	1,500				Data from Drawing Schedules. Counts confirmed with BMS or Fan Rm data
	New Bldg			Unit Ventilator	[illegible]	Trane	[illegible]	[illegible]				Data from Drawing Schedules. Counts confirmed with BMS or Fan Rm data
	New Bldg			Unit Ventilator	1	Trane	[illegible]	750				Data from Drawing Schedules. Counts confirmed with BMS or Fan Rm data

Boilers

Bldg	Tag#	Loc	Area Serving	Equip	Quan	Mfg	Model	Fuel	Heating Input Btu/h	Output Btu/h	Eff	Age	Exp Serv Life	Notes
New Bldg	B-1	[illegible]	New Bldg	Boiler	4	Cleaver Brooks	CB [illegible] 250	Natural Gas	10,461,000	8,365,000	80%	35	35	[illegible] HP Burner Motor
Main Bldg	B-1-A	MER	Main Bldg	Boiler	6	Patterson Kelley	[illegible]	Natural Gas	2,000,000	1,700,000	NA	35	35	Natural Gas Fired Heating Boiler [illegible] Condensate [illegible] pumps Type LIPS [illegible]

Water Pumps

Bldg	Tag#	Loc	Area Serving	Equip	Quan	Motor Mfg	Motor Model	HP	Volts	Amps	Motor RPM	Eff	VFD?	Pump Mfg	Model	Serial	Size	GPM	Head ft	Notes	Age	Exp Serv Life
New Bldg	P-1,2	MER	New Bldg	HHW Circ Pump	2	Marathon Electric	[illegible]	40	460	480	1765	NA	No	Aurora	410BF	1750	4X5	550	168	[illegible]	15	20
Main Bldg	P-1,2	MER	Main Bldg	HHW Circ Pump	2	Baldor	[illegible]	[illegible]	460	10.4	1145	88.5%	Yes	Armstrong	NA	1200	[illegible]	600	20	Suction Guide	[illegible]	20
Main Bldg	P-3,4	MER	Main Bldg	HHW Circ Pump	4	Baldor	[illegible]	15	460	20.1	1760	91.0%	Yes	Armstrong	NA	1800	[illegible]	550	60	Suction Guide	[illegible]	20
Main Bldg	NA	[illegible]	HVAC	Sewage Ejector Pump	1	Bell & Gossett	NA	NA	115	NA	NA	NA	No	Bell & Gossett	NA	NA	NA	NA	NA	[illegible]	[illegible]	15

Chillers

Bldg	Tag#	Location	Area Serving	Equip Name	Type	Mfg	Quantity	Model	Tons	kW/Ton	Refrigerant	Weight	Age
New Bldg		[illegible]	New Bldg	Chiller	[illegible]	Carrier	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]
New Bldg		[illegible]	New Bldg	Chiller	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]

CHW Pumps

Bldg	Tag#	Location	Area Serving	Equipment	[illegible]	Motor Model	Quantity	GPM	Head ft	HP	Efficiency	Motor RPM	VFD?	Age	Estimated Service Life
New Bldg	[illegible]	MER	New Bldg	CHW Pump	[illegible]	[illegible]	2	50	450	[illegible]	[illegible]	[illegible]	No	[illegible]	20

Lakeland Regional High School

Kitchen Equipment Inventory List

EQUIPMENT	TAG #	MODEL #	MANUFACTURER	QUANTITY	AREA SERVING	CAPACITY	ESTIMATED SERVICE LIFE	ESTIMATED AGE	EFFICIENCY	CFM (SA/OA)	NOTES
Walk-in Refrigerator	NA	NA	Kold Locker	2	Kitchen	NA	NA	20	NA	NA	2 1/20 hp Evap Fans
Walk-in Freezer	NA	NA	Kold Locker	1	Kitchen	NA	NA	20	NA	NA	3 Evap Fans
Walk-in Freezer	NA	NA	Nalidus	1	Kitchen	NA	NA	20	NA	NA	3 Evap Fans
Packaged Ice Cream Freezer	NA	356-937	Cleveland	2	Kitchen	5.3 cu ft	12	5	NA	NA	In serving lines
Packaged Ice Cream Freezer	NA	NA	TRUE	1	Kitchen	NA	12	10	NA	NA	looks like a new
Gas Convection Oven	NA	DCS-FSCO-IN	DCS	2	Kitchen	60 Mbtuh	12	5	NA	NA	-
Kitchen Hood	NA	NA	NA	1	Kitchen	150 sq ft	NA	NA	NA	NA	Appx 15' x 9'
Electric Food Warmer	NA	S-100	Bodine	1	Kitchen	7 serving stations	12	10	NA	NA	
Gas Stove	NA	NA	DCS	1	Kitchen	8 Burners	12	10	NA	NA	-
Reach-in Refrigerator	NA	NA	AccCAE	1	Kitchen	22 cu ft	12	10	NA	NA	115 V
Reach-in Refrigerator	NA	RA-30-S7	Victory	1	Kitchen	170 cu ft	12	5	NA	NA	115 V

Other Mechanical Equipment

Bldg	Tag#	Loc	Area Serving	Equip	Quan	Mfg	Model	Size	Motor	Cat	Spec	HP	V	Amps	RPM	Ser. F	Eff	Estimated Service Life	Notes
New	ONA	MER	New Building	[illegible] Air Compressor	[illegible]	Challenge Air	[illegible]	[illegible]	Baldor	[illegible]	[illegible]	7.5	460	[illegible]	1750	1.15	[illegible]	15	Pumps from 52 to 74 psig in 1 minute and cycles every 3 minutes
New	ONA	MER	New Building	Air Dryer	1	Speedaire	[illegible]					0.25	115					20	[illegible]
New	ONA	MER	New Building	Water Softeners	2	GE [illegible]		[illegible]										20	[illegible]

DOMESTIC HOT WATER

Bldg	Tag#	Location	Area Serving	Equipment	Quantity	Mfg	Model	Fuel	Gal	Recov	Input BTU	Age	Estimated Service Life	Notes
New	ONA	MER	New Building	Domestic Hot Water Tanks	2	A O Smith	BTP 140 400	Natural Gas	140	387	400,000	7	15	Natural Gas Fired Heating Boiler - Direct Vent Boiler

DOMESTIC HOT WATER PUMPS

Bldg	Tag#	Location	Area Serving	Equipment	Motor Mfg	Motor Model	Quantity	GPM	Head ft	HP	Efficiency	Motor RPM	VFD?	Age	Estimated Service Life
New	ONA	MER	New Bldg	DHW H/W Circ Pumps	Bell & Gossett	106189	3			1/4?			No	10?	10

LAKELAND HIGH SCHOOL
205 CONKLINTOWN ROAD
WANAQUE, NJ 07465

LN #	BLDG	FL #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Total Fix Wt Saved	KWh Saved	Annual Elec. Savings
1	EAST	2	CLASSROOM 200	2LF32T8 4FT WRAP	73	16	61	976	2LF32T8 841 RELAMP	0	16	61	976	4420	0	0	$ -
2	EAST	2	CLASSROOM 201	2LF32T8 4FT WRAP		9	61	549	2LF32T8 841 RELAMP	0	9	61	549	4420	0	0	$ -
3	EAST	2	CLASSROOM 202	2LF34T12 4FT SURFACE MOUNTED BOX	44	15	72	1080	2LF32T8 841 RELAMP REBALLAST	150	15	48	720	4420	360	1591.2	$ 238.68
4	EAST	2	CLASSROOM 203	2LF34T12 4FT SURFACE MOUNTED BOX	43	18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
5	EAST	2	CLASSROOM 204	2LF34T12 4FT SURFACE MOUNTED BOX		28	72	2016	2LF32T8 841 RELAMP REBALLAST	280	28	48	1344	4420	672	2970.24	$ 445.54
6	EAST	2	STORAGE/WORKROOM	2LF34T12 4FT SURFACE MOUNTED BOX		6	72	432	2LF32T8 841 RELAMP REBALLAST	60	6	48	288	4420	144	636.48	$ 95.47
7	EAST	2	OFFICE 204/205	2LF34T12 4FT SURFACE MOUNTED BOX	48	4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
8	EAST	2	CLASSROOM 205	2LF34T12 4FT SURFACE MOUNTED BOX		28	72	2016	2LF32T8 841 RELAMP REBALLAST	280	28	48	1344	4420	672	2970.24	$ 445.54
9	EAST	2	CLASSROOM 206	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
10	EAST	2	CLASSROOM 207	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
11	EAST	2	CLASSROOM 208	2LF34T12 4FT SURFACE MOUNTED BOX		15	72	1080	2LF32T8 841 RELAMP REBALLAST	150	15	48	720	4420	360	1591.2	$ 238.68
12	EAST	2	CLASSROOM 209	2LF34T12 4FT SURFACE MOUNTED BOX		15	72	1080	2LF32T8 841 RELAMP REBALLAST	150	15	48	720	4420	360	1591.2	$ 238.68
13	EAST	2	CLASSROOM 210	2LF32T8 4FT SURFACE MOUNTED BOX	75	32	61	1952	NEW 2LF32T8 4FT WRAP	0	32	55	1760	4420	192	848.64	$ 127.30
14	EAST	2	STORAGE ROOM	2LF34T12 4FT SURFACE MOUNTED BOX		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
15	EAST	2	STORAGE ROOM - CLOSET	75W A-19 INC		1	75	75	25W CFL	0	1	25	25	4420	50	221	$ 33.15
16	EAST	2	OFFICE	2LF34T12 4FT SURFACE MOUNTED BOX		6	72	432	2LF32T8 841 RELAMP REBALLAST	60	6	48	288	4420	144	636.48	$ 95.47
17	EAST	2	CLOSET	60W A-19 INC	30	1	60	60	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	5	22.1	$ 3.32
18	EAST	2	CLOSET - TELECOM ROOM	100W A-19 INC	20	1	100	100	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	45	198.9	$ 29.84
19	EAST	2	CLASSROOM 211	2LF34T12 4FT SURFACE MOUNTED BOX		32	72	2304	2LF32T8 841 RELAMP REBALLAST	320	32	48	1536	4420	768	3394.56	$ 509.18
20	EAST	2	WOMENS ENTRY	2X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
21	EAST	2	WOMENS BATH	2X4 4LF32T8 RECESSED	128	1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
22	EAST	2	WOMENS BATH - FACULTY BATH	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
23	EAST	2	CUSTODIAN CLOSET	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
24	EAST	2	MENS BATH ENTRY	2X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
25	EAST	2	MENS BATH	2X4 4LF32T8 RECESSED		1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
26	EAST	2	MENS BATH - FACULTY BATH	2LF34T12 4FT WRAP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
27	EAST	2	STORAGE/OFFICE	2LF34T12 4FT SURFACE MOUNTED BOX		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
28	EAST	2	CLASSROOM 212	2LF34T12 4FT SURFACE MOUNTED BOX		28	72	2016	2LF32T8 841 RELAMP REBALLAST	280	28	48	1344	4420	672	2970.24	$ 445.54
29	EAST	2	CORRIDOR	1X4 2LF32T8 RECESSED		6	61	366	2LF32T8 841 RELAMP	0	6	61	366	4420	0	0	$ -
30	EAST	2	CORRIDOR	2X4 3LF32T8 RECESSED		16	89	1424	3LF32T8 841 RELAMP	0	16	89	1424	4420	0	0	$ -
31	EAST	2	EXITS DOUBLE SIDED	EXITS INC 30W DS		2	30	60	NEW LED EXIT	0	2	2	4	8760	56	490.56	$ 73.58
32	EAST	2	BRIDGE ANNEX STAIRWELL	2LF32T8 4FT WRAP		2	61	122	2LF32T8 841 RELAMP	0	2	61	122	4420	0	0	$ -
33	EAST	1	BRIDGE ANNEX STAIRWELL	1LF34T12 4FT STRIP	120	1	43	43	NEW 1LF32T8 4FT WRAP	10	1	28	28	4420	15	66.3	$ 9.95
34	EAST	2	CONNECTOR HALLWAY	2X4 3LF32T8 RECESSED	157	2	89	178	3LF32T8 841 RELAMP	0	2	89	178	4420	0	0	$ -
35	EAST	2	STAIRWELL E3-2	2LF32T8 4FT WRAP		3	61	183	2LF32T8 841 RELAMP	0	3	61	183	4420	0	0	$ -

LN #	BLDG	FL #	Room Description	Existing Fixture Description	Light Level	Exst. Qty.	Exst. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Hours	Total Fix Wt Saved	kWh Saved	Annual Elec. Savings
36	EAST	2	STAIRWELL E3-2	1LF34T12 4FT STRIP		1	43	43	NEW 1LF32T8 4FT WRAP	10	1	28	28	4420	15	66.3	$ 9.95
37	EAST	2	STAIRWELL E3-2, EXIT SIGN DOUBLE SIDED	EXITS INC 30W		1	30	30	NEW LED EXIT	0	1	2	2	8760	28	245.28	$ 36.79
38	EAST	2	STAIRWELL E4-2	2LF32T8 4FT WRAP		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
39	EAST	2	STAIRWELL E4-2, Exit Double Sided	EXITS INC 30W DS		1	30	30	NEW LED EXIT	0	1	2	2	8760	28	245.28	$ 36.79
40	EAST	1	CHILD STUDY OFFICE	4LF32T8 4FT WIDE WRAP		6	112	672	NEW 2LF32T8 4FT WRAP	60	6	55	330	4420	342	1511.64	$ 226.75
41	EAST	1	CHILD STUDY OFFICE-OFFICE 1	2X4 4LF34T12 RECESSED		1	144	144	4LF32T8 841 RELAMP REBALLAST	20	1	95	95	4420	49	216.58	$ 32.49
42	EAST	1	CHILD STUDY OFFICE-OFFICE 2	4LF32T8 4FT WIDE WRAP	66	1	112	112	NEW 2LF32T8 4FT WRAP	10	1	55	55	4420	57	251.94	$ 37.79
43	EAST	1	CHILD STUDY OFFICE-OFFICE 3	4LF32T8 4FT WIDE WRAP	66	4	112	448	NEW 2LF32T8 4FT WRAP	40	4	55	220	4420	228	1007.76	$ 151.16
44	EAST	1	MAILROOM	4LF32T8 4FT WIDE WRAP	70	2	112	224	NEW 2LF32T8 4FT WRAP	20	2	55	110	4420	114	503.88	$ 75.58
45	EAST	1	MAIN OFFICE - OPEN	2X4 3LF32T8 RECESSED		8	89	712	3LF32T8 841 RELAMP	0	8	89	712	4420	0	0	$ -
46	EAST	1	MAIN OFFICE - VAULT	2X2 2LF32T8 U SURFACE MOUNTED BOX		1	61	61	2LF17T8 841 RELAMP REBALLAST W/REFLECTOR	0	1	47	47	4420	14	61.88	$ 9.28
47	EAST	1	MAIN OFFICE - FAX ROOM	4LF32T8 4FT WIDE WRAP		1	112	112	NEW 2LF32T8 4FT WRAP	10	1	55	55	4420	57	251.94	$ 37.79
48	EAST	1	MAIN OFFICE - VICE PRESIDENT	4LF32T8 4FT WIDE WRAP		1	112	112	NEW 2LF32T8 4FT WRAP	10	1	55	55	4420	57	251.94	$ 37.79
49	EAST	1	MAIN OFFICE - VICE PRESIDENT	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
50	EAST	1	SMALL HALLWAY	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
51	EAST	1	SMALL HALLWAY - CLOSET	2LF20T12 VANITY		1	51	51	NEW 2LF17T8 2FT VANITY	10	1	31	31	4420	20	88.4	$ 13.26
52	EAST	1	VICE PRINCIPAL OFFICE	4LF32T8 4FT WIDE WRAP		2	112	224	NEW 2LF32T8 4FT WRAP	20	2	55	110	4420	114	503.88	$ 75.58
53	EAST	1	ASSISTANT TO PRINCIPAL	4LF32T8 4FT WIDE WRAP		2	112	224	NEW 2LF32T8 4FT WRAP	20	2	55	110	4420	114	503.88	$ 75.58
54	EAST	1	PRINCIPAL'S OFFICE	4LF32T8 4FT WIDE WRAP		4	112	448	NEW 2LF32T8 4FT WRAP	40	4	55	220	4420	228	1007.76	$ 151.16
55	EAST	1	PRINCIPAL'S OFFICE	2LF34T12 4FT WRAP		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
56	EAST	1	OFFICE WORK ROOM	2LF34T12 4FT SURFACE MOUNTED BOX		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
57	EAST	1	WOMENS TOILET	1LF34T12 VANITY		1	43	43	1LF32T8 841 RELAMP REBALLAST	10	1	28	28	4420	15	66.3	$ 9.95
58	EAST	1	HALL TOILET PAPER STORAGE	2LF34T12 4FT SURFACE MOUNTED BOX		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
59	EAST	1	CLASSROOM 100	2LF34T12 4FT SURFACE MOUNTED BOX		5	72	360	2LF32T8 841 RELAMP REBALLAST	50	5	48	240	4420	120	530.4	$ 79.56
60	EAST	1	MENS TOILET	2X4 3LF32T8 RECESSED	100	3	89	267	3LF32T8 841 RELAMP	0	3	89	267	4420	0	0	$ -
61	EAST	1	MENS TOILET	2LF32T8 4FT VANITY		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
62	EAST	1	FACULTY ROOM - ENTRY	75W A-19 INC X 2 SURFACE MOUNTED BOX		1	75	75	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	20	88.4	$ 13.26
63	EAST	1	FACULTY ROOM - OPEN	2LF32T8 4FT SURFACE MOUNTED BOX		8	61	488	NEW 2LF32T8 4FT WRAP	0	8	55	440	4420	48	212.16	$ 31.82
64	EAST	1	FACULTY ROOM - CLOSET	100W A-19 INC		1	100	100	25W CFL	0	1	25	25	4420	75	331.5	$ 49.73
65	EAST	1	FACULTY ROOM - COPY ROOM	2LF34T12 4FT SURFACE MOUNTED BOX		3	72	216	2LF32T8 841 RELAMP REBALLAST	30	3	48	144	4420	72	318.24	$ 47.74
66	EAST	1	FACULTY ROOM - TOILET	2LF20T12 2FT VANITY		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
67	EAST	1	CONFERENCE ROOM	2LF34T12 4FT SURFACE MOUNTED BOX		14	72	1008	2LF32T8 841 RELAMP REBALLAST	140	14	48	672	4420	336	1485.12	$ 222.77
68	EAST	1	CONFERENCE ROOM CLOSET	75W A-19 INC		1	75	75	25W CFL	0	1	25	25	4420	50	221	$ 33.15
69	EAST	1	STORAGE/ELECTRICAL ROOM	75W A-19 INC		1	75	75	25W CFL	0	1	25	25	4420	50	221	$ 33.15
70	EAST	1	STORAGE/ELECTRICAL ROOM	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
71	EAST	1	CLASSROOM 101	2LF34T12 4FT SURFACE MOUNTED BOX		24	72	1728	2LF32T8 841 RELAMP REBALLAST	240	24	49	1152	4420	576	2545.92	$ 381.89
72	EAST	1	CLASSROOM 102	2LF32T8 4FT SURFACE MOUNTED BOX		12	61	732	NEW 2LF32T8 4FT WRAP	0	12	55	660	4420	72	318.24	$ 47.74

LN #	BLDG	FL #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Saved	KWh Saved	Annual Elec. Savings
73	EAST	1	CLASSROOM 103	2LF32T8 4FT SURFACE MOUNTED BOX		24	61	1464	NEW 2LF32T8 4FT WRAP	0	24	55	1320	4420	144	636.48	$ 95.47
74	EAST	1	CLASSROOM 104	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
75	EAST	1	CLASSROOM 105	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
76	EAST	1	CLASSROOM 106	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
77	EAST	1	CLASSROOM 107	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
78	EAST	1	CLASSROOM 108	2LF34T12 4FT SURFACE MOUNTED BOX		15	72	1080	2LF32T8 841 RELAMP REBALLAST	150	15	48	720	4420	360	1591.2	$ 238.68
79	EAST	1	CLASSROOM 109	2LF34T12 4FT SURFACE MOUNTED BOX		15	72	1080	2LF32T8 841 RELAMP REBALLAST	150	15	48	720	4420	360	1591.2	$ 238.68
80	EAST	1	CLASSROOM 110	2LF34T12 4FT SURFACE MOUNTED BOX		32	72	2304	2LF32T8 841 RELAMP REBALLAST	320	32	48	1536	4420	768	3394.56	$ 509.18
81	EAST	1	CLASSROOM 111	2LF34T12 4FT SURFACE MOUNTED BOX		16	72	1152	2LF32T8 841 RELAMP REBALLAST	160	16	48	768	4420	384	1697.28	$ 254.59
82	EAST	1	CLASSROOM 111	75W INC FLOOD		5	75	375	23W CFL FLOOD PAR 38	0	5	23	115	4420	260	1149.2	$ 172.38
83	EAST	1	CLASSROOM 112	2LF34T12 4FT SURFACE MOUNTED BOX		24	72	1728	2LF32T8 841 RELAMP REBALLAST	240	24	48	1152	4420	576	2545.92	$ 381.89
84	EAST	1	GIRLS TOILET - ENTRY	2X4 3LF32T8 RECESSED		1	89	89	3LF32T8 841 RELAMP	0	1	89	89	4420	0	0	$ -
85	EAST	1	GIRLS TOILET - OPEN	2X4 4LF32T8 RECESSED		1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
86	EAST	1	GIRLS TOILET - FACULTY	3L 75INC A-19 1X1		1	225	225	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	170	751.4	$ 112.71
87	EAST	1	CUSTODIAN/ELECTRICAL ROOM	4LF32T8 4FT WIDE WRAP		1	112	112	NEW 2LF32T8 4FT WRAP	10	1	55	55	4420	57	251.94	$ 37.79
88	EAST	1	BOYS TOILET - ENTRY	2X4 3LF32T8 RECESSED		1	89	89	3LF32T8 841 RELAMP	0	1	89	89	4420	0	0	$ -
89	EAST	1	BOYS TOILET - OPEN	2X4 4LF32T8 RECESSED	78	1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
90	EAST	1	BOYS TOILET - FACULTY	3L 75INC A-19 1X1	80	1	225	225	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	170	751.4	$ 112.71
91	ANNEX	2	CORRIDOR	2X4 3LF32T8 RECESSED		7	89	623	3LF32T8 841 RELAMP	0	7	89	623	4420	0	0	$ -
92	ANNEX	2	CORRIDOR - EXITS	LED EXITS		2	2	4	NO CHANGE	0	2	2	4	8760	0	0	$ -
93	ANNEX	2	E1-2 STAIRS	1LF34T12 4FT STRIP		2	43	86	NEW 1LF32T8 4FT WRAP	20	2	28	56	4420	30	132.6	$ 19.89
94	ANNEX	2	S1-2 STAIRS	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
95	ANNEX	2	CLASSROOM 6	2LF34T12 4FT SURFACE MOUNTED BOX		16	72	1256	2LF32T8 841 RELAMP REBALLAST	180	16	48	864	4420	432	1909.44	$ 286.42
96	ANNEX	2	CLASSROOM 11	2LF34T12 4FT SURFACE MOUNTED BOX		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
97	ANNEX	2	CLASSROOM 7	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
98	ANNEX	2	CLASSROOM 8	2LF34T12 4FT SURFACE MOUNTED BOX		15	72	1080	2LF32T8 841 RELAMP REBALLAST	150	15	48	720	4420	360	1591.2	$ 238.68
99	ANNEX	2	CLASSROOM 9	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1253	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
100	ANNEX	2	CLASSROOM 10	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
101	ANNEX	2	WOMENS TOILET	2LF34T12 4FT VANITY		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
102	ANNEX	2	MENS TOILET	1LF26T8 3FT VANITY		1	26	26	NO CHANGE	0	1	26	26	4420	0	0	$ -
103	ANNEX	1	CONNECTOR HALLWAY E-2	2X4 3LF32T8 RECESSED		2	89	178	3LF32T8 841 RELAMP	0	2	89	178	4420	0	0	$ -
104	ANNEX	1	CORRIDOR	2X4 3LF32T8 RECESSED		7	89	623	3LF32T8 841 RELAMP	0	7	89	623	4420	0	0	$ -
105	ANNEX	1	CLASSROOM 1	2LF32T8 4FT SURFACE MOUNTED BOX		18	61	1098	NEW 2LF32T8 4FT WRAP	0	18	55	990	4420	108	477.36	$ 71.60
106	ANNEX	1	CLASSROOM 1 1/2	2LF34T12 4FT SURFACE MOUNTED BOX		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
107	ANNEX	1	CLASSROOM 2	2LF32T8 4FT WRAP		18	61	1098	2LF32T8 841 RELAMP	0	18	61	1098	4420	0	0	$ -
108	ANNEX	1	CLASSROOM 3	2LF34T12 4FT SURFACE MOUNTED BOX		15	72	1080	2LF32T8 841 RELAMP REBALLAST	150	15	48	720	4420	360	1591.2	$ 238.68
109	ANNEX	1	CLASSROOM 4	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1255	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42

LN #	BLDG	FL #	Room Description	Existing Fixture Description	Light Level	Exist. Qty	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Total Fix Wt Saved	KWh Saved	Annual Elec. Savings
110	ANNEX	1	CLASSROOM 5	2LF34T12 4FT SURFACE MOUNTED BOX		18	72	1296	2LF32T8 841 RELAMP REBALLAST	580	18	48	864	4420	432	1909.44	$ 286.42
111	ANNEX	1	CUSTODIAN CLOSET	150W A-19 INC		1	150	150	25W CFL	0	1	25	25	4420	125	552.5	$ 82.88
112	ANNEX	1	CUSTODIAN CLOSET - STORAGE ROOM	150W A-19 INC		2	150	300	25W CFL	0	2	25	50	4420	250	1105	$ 165.75
113	EAST	1	CORRIDOR	2X4 4LF32T8 RECESSED		57	112	6384	4LF32T8 841 RELAMP	0	57	112	6384	4420	0	0	$ -
114	EAST	1	CORRIDOR - EXITS	EXITS INC 30W DS		1	30	30	NEW LED EXIT	0	1	2	2	8760	28	245.28	$ 36.79
115	EAST	1	CORRIDOR	2X4 4LF32T8 RECESSED		18	112	2016	4LF32T8 841 RELAMP	0	18	112	2016	4420	0	0	$ -
116	EAST	1	CORRIDOR - EXITS	LED EXITS		4	2	8	NO CHANGE	0	4	2	8	8760	0	0	$ -
117	EAST	1	E-5 ENTRY	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
118	EAST	1	E-5 EXIT SS	EXITS INC 30W SS		1	30	30	NEW LED EXIT	0	1	2	2	8760	28	245.28	$ 36.79
119	EAST	1	BOYS TOILET - OPEN	2X4 4LF32T8 RECESSED	60	1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
120	EAST	1	GIRLS TOILET - OPEN	2X4 4LF32T8 RECESSED	60	1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
121	EAST	1	CAFETERIA - OPEN	2LF34T12 4FT SURFACE MOUNTED BOX	58	58	72	4176	2LF32T8 841 RELAMP REBALLAST	580	58	48	2784	4420	1392	6152.64	$ 922.90
122	EAST	1	CAFETERIA - SODA MACHINE	SODA MACHINE		2	400	800	VENDING MISER	0	2	216	432	8760	368	3223.68	$ 483.55
123	EAST	1	CAFETERIA - SNACK MACHINES	SNACK MACHINE		2	400	800	VENDING MISER	0	2	216	432	8760	368	3223.68	$ 483.55
124	EAST	1	CAFETERIA - EXITS LED	LED EXITS		4	2	8	NO CHANGE	0	4	2	8	8760	0	0	$ -
125	EAST	1	FACULTY DINING ENTRY	4LF34T12 8FT WRAP	58	1	144	144	NEW 4LF32T8 8FT WRAP	20	1	95	55	4420	49	216.58	$ 32.49
126	EAST	1	FACULTY DINING OPEN	4LF32T8 8FT WRAP		9	112	1008	4LF32T8 841 RELAMP	0	9	112	1008	4420	0	0	$ -
127	EAST	1	FACULTY DINING - SODA MACHINE	SODA MACHINE		1	400	400	VENDING MISER	0	1	216	216	8760	184	1611.84	$ 241.78
128	EAST	1	LOADING DOCK - STORAGE ROOM FOR SNOW SHOVELS	200W A-19 INC		1	200	200	42W CFL	0	1	42	42	4420	158	698.36	$ 104.75
129	EAST	1	KITCHEN - OPEN	2X4 3LF32T8 RECESSED		16	89	1602	2LF32T8 841 RELAMP	0	16	89	1602	4420	0	0	$ -
130	EAST	1	KITCHEN - OPEN	1X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
131	EAST	1	KITCHEN - OPEN	1X8 4LF32T8 RECESSED		1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
132	EAST	1	KITCHEN - HOOD	2LF20T12 2FT RECESSED 4 SCREWS		6	56	336	2LF17T8 841 RELAMP REBALLAST	60	6	31	186	4420	150	663	$ 99.45
133	EAST	1	KITCHEN - REFRIGERATORS	75W A-19 INC		3	75	225	25W CFL	0	3	25	75	4420	150	663	$ 99.45
134	EAST	1	KITCHEN - WASHING MACHINE ROOM	75W A-19 INC		1	75	75	25W CFL	0	1	25	25	4420	50	221	$ 33.15
135	EAST	1	KITCHEN - DRY STORAGE	2X4 3LF32T8 RECESSED	50	2	89	178	3LF32T8 841 RELAMP	0	2	89	178	4420	0	0	$ -
136	EAST	1	KITCHEN - OFFICE	2X4 4LF32T8 RECESSED	40	1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
137	EAST	1	KITCHEN - LARGE DRY STORAGE	4LF34T12 4FT WIDE WRAP		3	144	432	NEW 2LF32T8 4FT WRAP	30	3	55	165	4420	267	1180.14	$ 177.02
138	EAST	1	KITCHEN - TOILET	2LF34T12 4FT WRAP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
139	EAST	1	KITCHEN - ICE CREAM ROOM	2X4 3LF32T8 RECESSED		1	89	89	3LF32T8 841 RELAMP	0	1	89	89	4420	0	0	$ -
140	EAST	1	STORAGE ROOM	2LF34T12 4FT WRAP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
141	EAST	1	STORAGE ROOM	150W A-19 INC		1	150	150	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	95	419.9	$ 62.99
142	EAST	1	STORAGE ROOM	2LF34T12 4FT WRAP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
143	EAST	1	BOILER ROOM	2LF96T12 8FT STRIP		2	123	246	NEW 4LF32T8 8FT STRIP	40	2			4420			
144	EAST	1	BOILER ROOM	2LF96T12 8FT INDUSTRIAL PEND MTD		7	123	861	NEW 4LF32T8 8FT STRIP, PEND MTD	140	7	95	665	4420	196	866.32	$ 129.95
145	EAST	1	BOILER ROOM	2LF34T12 4FT WRAP		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
146	EAST	1	MAINTENANCE OFFICE - OPEN	2LF96T12 8FT STRIP, CHAIN MTD		4	123	492	NEW 4LF32T8 8FT VAPOR TIGHT PEND MTD	80	4	95	380	4420	112	495.04	$ 74.26

LN #	BLDG	FL. #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Total Fix Wt Saved	kWh Saved	Annual Elec Savings
147	EAST	1	MAINTENANCE OFFICE - STORAGE	2LF32T8 4FT WRAP		5	61	305	2LF32T8 841 RELAMP	0	5	61	305	4420	0	0	$ -
148	EAST	1	MAINTENANCE OFFICE - HALLWAY	2LF32T8 4FT WRAP		3	61	183	2LF32T8 841 RELAMP	0	3	61	183	4420	0	0	$ -
149	EAST	1	MAINTENANCE OFFICE - OPEN	1X4 2LF32T8 RECESSED		2	61	122	2LF32T8 841 RELAMP	0	2	61	122	4420	0	0	$ -
150	EAST	1	MAINTENANCE OFFICE - OPEN	2LF32T8 4FT WRAP		3	61	183	2LF32T8 841 RELAMP	0	3	61	183	4420	0	0	$ -
151	EAST	1	MAINTENANCE OFFICE - TOILET	2LF34T12 4FT WRAP	20	1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
152	EAST	1	CLASSROOM 300	4LF34T12 8FT SURFACE MOUNTED BOX	40	15	144	2160	NEW 4LF32T8 8FT WRAP	300	15	96	1425	4420	735	3248.7	$ 487.31
153	EAST	1	CLASSROOM 300	2LF34T12 4FT SURFACE MOUNTED BOX		5	72	360	2LF32T8 841 RELAMP REBALLAST	50	5	46	240	4420	120	530.4	$ 79.56
154	EAST	1	CLASSROOM 300 - STORAGE	2LF34T12 4FT WRAP		3	72	216	2LF32T8 841 RELAMP REBALLAST	30	3	48	144	4420	72	318.24	$ 47.74
155	EAST	1	MENS TOILET	2LF34T12 4FT WRAP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
156	EAST	1	GIRLS TOILET - OPEN	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
157	EAST	1	GIRLS TOILET - OPEN	1LF32T8 4FT VANITY		1	31	31	1LF32T8 841 RELAMP	0	1	31	31	4420	0	0	$ -
158	EAST	1	CLASSROOM 301 - WOODSHOP	4LF34T12 8FT PEND MTD		13	144	1872	NEW 4LF32T8 8FT VAPOR TIGHT PEND MTD	260	13	96	1235	4420	637	2815.54	$ 422.33
159	EAST	1	CLASSROOM 301 - STORAGE #1	4LF34T12 8FT SURFACE MOUNTED BOX		1	144	144	NEW 4LF32T8 8FT WRAP	20	1	96	95	4420	49	216.58	$ 32.49
160	EAST	1	CLASSROOM 301 - STORAGE #2	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
161	EAST	1	CLASSROOM 301 - PAINT ROOM	75W A-19 INC FIRE PROOF		2	75	150	25W CFL	0	2	25	50	4420	100	442	$ 66.30
162	EAST	1	CLASSROOM 300 - OFFICE	2X4 2LF32T8 RECESSED		2	61	122	2LF32T8 841 RELAMP	0	2	61	122	4420	0	0	$ -
163	EAST	1	CLASSROOM 300 - STORAGE #3	2x4 2LF32T8 RECESSED		2	61	122	2LF32T8 841 RELAMP	0	2	61	122	4420	0	0	$ -
164	EAST	1	CLASSROOM 300 - STORAGE #4	2LF32T8 4FT WRAP		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
165	EAST	1	CLASSROOM 302	6LF32T8 8FT PARABOLIC SUSPENDED		10	178	1780	6LF32T8 841 RELAMP	0	10	178	1780	4420	0	0	$ -
166	EAST	1	CLASSROOM 302	2LF32T8 4FT PARABOLIC SUSPENDED		2	89	178	2LF32T8 841 RELAMP	0	2	89	178	4420	0	0	$ -
167	EAST	1	CLASSROOM 302	4LF32T8 INDIRECT SUSPENDED		6	112	672	4LF32T8 841 RELAMP	0	6	112	672	4420	0	0	$ -
168	EAST	1	CLASSROOM 302 - OFFICE	2X4 3LF32T8 RECESSED		3	89	267	3LF32T8 841 RELAMP	0	3	89	267	4420	0	0	$ -
169	EAST	1	CLASSROOM 303	6LF32T8 8FT PARABOLIC SUSPENDED		9	178	1602	6LF32T8 841 RELAMP	0	9	178	1602	4420	0	0	$ -
170	EAST	1	CLASSROOM 303	2LF32T8 4FT PARABOLIC SUSPENDED		2	89	178	2LF32T8 841 RELAMP	0	2	89	178	4420	0	0	$ -
171	EAST	1	CLASSROOM 303	4LF32T8 INDIRECT SUSPENDED		6	112	672	4LF32T8 841 RELAMP	0	6	112	672	4420	0	0	$ -
172	EAST	1	CLASSROOM 303	2LF32T8 INDIRECT SUSPENDED		3	61	183	2LF32T8 841 RELAMP	0	3	61	183	4420	0	0	$ -
173	EAST	1	CLASSROOM 303 - STORAGE	2LF34T12 4FT SURFACE MOUNTED BOX, PEND MTD		1	72	72	NEW 2LF32T8 4FT PEND MTD	10	1	55	55	4420	17	75.14	$ 11.27
174	EAST	1	CLASSROOM 303 - COMPUTER ROOM	2X4 3LF32T8 RECESSED		3	89	267	3LF32T8 841 RELAMP	0	3	89	267	4420	0	0	$ -
175	EAST	1	WEIGHT ROOM - ENTRY	2LF30T12 3FT RECESSED		1	66	66	NEW 2LF32T8 VAPOR TITE	0	1	71	71	4420	-5	-22.1	$ (3.32)
176	EAST	1	WEIGHT ROOM - OPEN	2LF34T12 8FT RECESSED		6	72	432	2LF32T8 841 RELAMP REBALLAST	60	6	48	288	4420	144	636.48	$ 95.47
177	EAST	1	WEIGHT ROOM - OPEN	1LF34T12 4FT RECESSED	43	6	43	258	1LF32T8 841 RELAMP REBALLAST	60	6	28	168	4420	90	397.8	$ 59.67
178	EAST	1	WEIGHT ROOM - STORAGE	2LF34T12 4FT WRAP, CHAIN MTD		1	72	72	NEW 2LF32T8 4FT WRAP, CHAIN MTD	10	1	55	55	4420	17	75.14	$ 11.27
179	EAST	1	WEIGHT ROOM - OFFICE	1LF34T12 4FT RECESSED		1	43	43	1LF32T8 841 RELAMP REBALLAST	10	1	28	28	4420	15	66.3	$ 9.95
180	EAST	1	WEIGHT ROOM - OFFICE TOILET	2LF34T12 4FT WRAP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
181	EAST	1	WEIGHT ROOM - OFFICE TOILET	75W A-19 INC		1	75	75	NEW 1LF32T8 4FT VANITY	0	1	28	28	4420	47	207.74	$ 31.16
182	EAST	1	BOYS LOCKER ROOM HALL	2X2 2LF32T8 U SURFACE MOUNTED BOX		5	61	305	2LF17T8 841 RELAMP REBALLAST W/REFLECTOR	0	5	47	235	4420	70	309.4	$ 46.41
183	EAST	1	BOYS LOCKER ROOM ENTRY	3L 75INC A-19 1X1		1	225	225	NEW 2LF32T8 4FT VAPOR TITE	0	1	73	73	4420	152	671.84	$ 100.78

LN #	BLDG	FL #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Saved	KWh Saved	Annual Elec. Savings
184	EAST	1	BOYS LOCKER ROOM EXITS	EXITS INC 30W DS		1	30	30	NEW LED EXIT	0	1	2	2	8760	28	245.28	$ 36.79
185	EAST	1	BOYS LOCKER ROOM - STORAGE #1	3L 75INC A-19 1X1		1	225	225	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	170	751.4	$ 112.71
186	EAST	1	BOYS LOCKER ROOM - CUSTODIAN	75W A-19 INC		1	75	75	25W CFL	0	1	25	25	4420	50	221	$ 33.15
187	EAST	1	BOYS LOCKER ROOM - TOILET	3L 75INC A-19 1X1		2	225	450	NEW 2LF32T8 4FT VAPOR TITE	0	2	73	146	4420	304	1343.68	$ 201.55
188	EAST	1	BOYS LOCKER ROOM - LOCKERS	8X8 4LF34T12 RECESSED		5	144	720	4LF32T8 841 RELAMP REBALLAST	100	5	95	475	4420	245	1082.9	$ 162.44
189	EAST	1	BOYS LOCKER ROOM - STORAGE #2	1LF34T12 4FT RECESSED	35	2	43	86	1LF32T8 841 RELAMP REBALLAST	20	2	28	56	4420	30	132.6	$ 19.89
190	EAST	1	BOYS LOCKER ROOM - SHOWERS	75W A-19 INC		5	75	375	NEW 1x26W CFL SURFACE	125	5	26	130	4420	245	1082.9	$ 162.44
191	EAST	1	GYMNASIUM - STORAGE	MH400		1	458	458	NEW 6LF32T8 GYM BAY	100	1	224	224	4420	234	1034.28	$ 155.14
192	EAST	1	GYMNASIUM - ENTRY	2X4 3LF32T8 RECESSED		2	89	178	3LF32T8 841 RELAMP	0	2	89	178	4420	0	0	$ -
193	EAST	1	GYMNASIUM - ENTRY	LED EXITS		2	2	4	NO CHANGE	0	2	2	4	8760	0	0	$ -
194	EAST	1	GYMNASIUM - OPEN	400W MH HIGH BAYS		16	458	7328	NEW 6LF32T8 GYM BAY	1600	16	224	3584	4420	3744	16549.48	$ 2,482.27
195	EAST	1	GYMNASIUM - OPEN	EXITS INC 30W RECESSED		3	30	90	NEW LED EXIT	0	3	2	6	8760	84	735.84	$ 110.38
196	EAST	1	WOMENS LOCKER ROOM - ENTRY	2x2 2LF32T8 U SURFACE MOUNTED BOX		1	61	61	3LF17T8 841 RELAMP REBALLAST W/REFLECTOR	0	1	47	47	4420	14	61.88	$ 9.28
197	EAST	1	WOMENS LOCKER ROOM - STORAGE #1	100W A-19 INC		1	100	100	25W CFL	0	1	25	25	4420	75	331.5	$ 49.73
198	EAST	1	WOMENS LOCKER ROOM - OPEN	2X2 2LF32T8 U SURFACE MOUNTED BOX		2	61	122	2LF17T8 841 RELAMP REBALLAST W/REFLECTOR	0	2	47	94	4420	28	123.76	$ 18.56
199	EAST	1	WOMENS LOCKER ROOM - OPEN	2LF34T12 8FT RECESSED		7	72	504	2LF32T8 841 RELAMP REBALLAST	70	7	48	336	4420	168	742.56	$ 111.38
200	EAST	1	WOMENS LOCKER ROOM - SHOWERS	75W A-19 INC RECESSED		3	75	225	NEW 1x26W CFL SURFACE	75	3	26	78	4420	147	649.74	$ 97.46
201	EAST	1	WOMENS LOCKER ROOM - TOILET	4LF34T12 4FT WIDE WRAP		1	144	144	NEW 2LF32T8 4FT VAPOR TITE	10	1	73	73	4420	71	313.82	$ 47.07
202	EAST	1	WOMENS LOCKER ROOM - SMALL STORAGE #2	75W A-19 INC		1	75	75	NEW 2LF32T8 4FT VAPOR TITE	0	1	73	73	4420	2	8.84	$ 1.33
203	EAST	1	WOMENS LOCKER ROOM - SMALL STORAGE #3	2LF34T12 8FT RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
204	EAST	1	WOMENS LOCKER ROOM - SMALL STORAGE #3 TOILET	3L 75INC A-19 1X1		1	225	225	NEW 2LF32T8 4FT VANITY	0	1	55	55	4420	170	751.4	$ 112.71
205	EAST	1	WOMENS LOCKER ROOM - CLOSET	200W A-19 INC		1	200	200	42W CFL	0	1	42	42	4420	158	698.36	$ 104.75
206	EAST	1	CLASSROOM 305	4LF32T8 8FT WRAP		9	112	1008	NEW 4LF32T8 8FT WRAP	180	9	95	855	4420	153	676.26	$ 101.44
207	EAST	1	OFFICE	2LF34T12 4FT WRAP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
208	EAST	1	ELECTRIC ROOM	2LF34T12 4FT WRAP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
209	EAST	1	OFFICES	2LF34T12 4FT SURFACE MOUNTED BOX PER	20	2	72	144	NEW 2LF32T8 4FT PEND MTD	20	2	55	110	4420	34	150.28	$ 22.54
210	EAST	1	OFFICES	2x2 2LF32T8 U SURFACE MOUNTED BOX		1	61	61	3LF17T8 841 RELAMP REBALLAST W/REFLECTOR	0	1	47	47	4420	14	61.88	$ 9.28
211	EAST	1	GIRLS TOILET	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
212	EAST	1	BOYS TOILET	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
213	EAST	1	CLASSROOM 306	4LF34T12 8FT PEND MTD		20	144	2880	NEW 4LF32T8 8FT PEND MTD	400	20	95	1900	4420	590	4331.6	$ 649.74
214	EAST	1	CORRIDOR - STORAGE CLOSET	75W A-19 INC 1X1		1	75	75	NEW 1x26W CFL SURFACE	25	1	26	26	4420	49	216.58	$ 32.49
215	EAST	1	CORRIDOR	2x4 3LF32T8 RECESSED		9	89	801	3LF32T8 841 RELAMP	0	9	89	801	4420	0	0	$ -
216	EAST	1	CORRIDOR - EXITS	EXITS INC 30W DS		2	30	60	NEW LED EXIT	0	2	2	4	8760	56	490.56	$ 73.58
217	EAST	1	STAGE	4LF32T8 4FT WIDE WRAP		10	112	1120	4LF32T8 841 RELAMP	0	10	112	1120	4420	0	0	$ -
218	EAST	1	STAGE	2LF34T12 4FT PEND MTD		3	72	216	REMOVE	0	3	1	3	4420	213	941.46	$ 141.22
219	EAST	1	STAGE CAGE	1LF34T12 4FT VANITY		3	43	129	1LF32T8 841 RELAMP REBALLAST	30	3	28	84	4420	45	198.9	$ 29.84
220	EAST	1	AUDITORIUM	100W A-19 INC RCO		32	100	3200	23W PAR 38 CFL	0	32	23	736	4420	2464	10890.88	$ 1,633.63

LN #	BLDG	FL #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Hours	Total Fix Wts Saved	KWH Saved	Annual Elec. Savings
221	EAST	1	AUDITORIUM - SOUND SYSTEM AREA	100W A-19 INC RCO		3	100	300	23W PAR 38 CFL	0	3	23	69	4420	231	1021.02	$ 153.15
222	EAST	1	AUDITORIUM - EXITS	EXITS 2L 13W CFL		4	26	104	NEW LED EXIT	0	4	2	8	8760	96	840.96	$ 126.14
223	EAST	1	STAIRWELL TO ATTIC	75W A-19 INC		2	75	150	25W CFL	0	2	25	50	4420	100	442	$ 66.30
224	EAST	1	ATTIC	75W A-19 INC		3	75	225	25W CFL	0	3	25	75	4420	150	663	$ 99.45
225	EAST	1	LIGHT BOOTH	75W A-19 INC		2	75	150	NEW 2LF32T8 4FT WRAP	0	2	55	110	4420	40	176.8	$ 26.52
226	EAST	1	CORRIDOR - EXITS	LED EXITS		2	2	4	NO CHANGE	0	2	2	4	8760	0	0	$ -
227	EAST	1	GYM	2x4 3LF32T8 RECESSED	68	18	89	1602	3LF32T8 841 RELAMP	0	18	89	1602	4420	0	0	$ -
228	EAST	1	GYM - EXITS	EXITS INC 30W OS		1	30	30	NEW LED EXIT	0	1	2	2	8760	28	245.28	$ 36.79
229	WEST	2	ELEVATOR	1LF34T12 4FT STRIP	100	3	43	129	1LF32T8 841 RELAMP REBALLAST	30	3	28	84	4420	45	198.9	$ 29.84
230	WEST	2	BRIDGE	1X4 2LF32T8 RECESSED		18	61	1098	2LF32T8 841 RELAMP	0	18	61	1098	4420	0	0	$ -
231	WEST	2	CORRIDOR SECOND FLOOR	1X4 2LF32T8 RECESSED		62	61	3782	2LF32T8 841 RELAMP	0	62	61	3782	4420	0	0	$ -
232	WEST	1	CASE #1	2LF32T8 4FT STRIP		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
233	WEST	1	CASE #2	2LF32T8 4FT STRIP		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
234	WEST	1	CASE #3	2LF40T12 4FT STRIP 40W		4	100	400	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	208	919.36	$ 137.90
235	WEST	1	CASE #4	2LF40T12 4FT STRIP 40W		4	100	400	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	208	919.36	$ 137.90
236	WEST	2	ARTWORK CASES	2LF34T12 4FT STRIP		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
237	WEST	2	MENS TOILET	1x8 4LF34T12 RECESSED		1	144	144	4LF32T8 841 RELAMP REBALLAST	20	1	95	95	4420	49	216.58	$ 32.49
238	WEST	2	MENS TOILET	2LF34T12 4FT VANITY		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
239	WEST	2	WOMENS TOILET	1X8 4LF34T12 RECESSED		1	144	144	4LF32T8 841 RELAMP REBALLAST	20	1	95	95	4420	49	216.58	$ 32.49
240	WEST	2	WOMENS TOILET	2LF34T12 4FT VANITY		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
241	WEST	2	CLASSROOM - 514	1X4 3LF32T8 RECESSED	50	13	89	1157	3LF32T8 841 RELAMP	0	13	89	1157	4420	0	0	$ -
242	WEST	2	MENS TOILET	2LF34T12 4FT VANITY		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
243	WEST	2	MENS TOILET	1X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
244	WEST	2	WOMENS TOILET	1X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
245	WEST	2	WOMENS TOILET	1X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
246	WEST	2	CLASSROOM 513	1X4 3LF32T8 RECESSED		15	89	1335	3LF32T8 841 RELAMP	0	15	89	1335	4420	0	0	$ -
247	WEST	2	CLASSROOM 512	1X4 3LF32T8 RECESSED		15	89	1335	3LF32T8 841 RELAMP	0	15	89	1335	4420	0	0	$ -
248	WEST	2	DEPARTMENT OFFICE	1X4 3LF32T8 RECESSED		5	89	445	3LF32T8 841 RELAMP	0	5	89	445	4420	0	0	$ -
249	WEST	2	FAN ROOM D	2LF34T12 4FT STRIP, CHAIN MTD		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
250	WEST	2	FAN ROOM D	2LF96T12 8FT STRIP, CHAIN MTD		1	123	123	NEW 4LF32T8 8FT STRIP	20	1	95	95	4420	28	123.76	$ 18.56
251	WEST	2	BOOK STORAGE #1	1X4 3LF32T8 RECESSED		3	89	267	3LF32T8 841 RELAMP	0	3	89	267	4420	0	0	$ -
252	WEST	2	BOOK STORAGE #2	2LF32T8 4FT WRAP		2	61	122	2LF32T8 841 RELAMP	0	2	61	122	4420	0	0	$ -
253	WEST	2	BOOK STORAGE #3	1X4 3LF34T12 RECESSED		3	115	345	3LF32T8 841 RELAMP REBALLAST	60	3	71	213	4420	132	583.44	$ 87.52
254	WEST	2	FAN ROOM C	2LF34T12 4FT STRIP, CHAIN MTD		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
255	WEST	2	FAN ROOM C	2LF96T12 8FT STRIP, CHAIN MTD		1	123	123	NEW 4LF32T8 8FT STRIP	20	1	95	95	4420	28	123.76	$ 18.56
256	WEST	2	CLASSROOM - 509	1X4 3LF32T8 RECESSED	85	5	89	445	3LF32T8 841 RELAMP	0	5	89	445	4420	0	0	$ -
257	WEST	5	STAIRWELL/CORRIDOR W24-2	1X4 2LF34T12 RECESSED		3	72	216	2LF32T8 841 RELAMP REBALLAST	33	3	48	144	4420	72	318.24	$ 47.74

Line #	BLDG	FL. #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Saved Hours	Total Fix Wt Saved KWh	KWh Saved	Annual Elec. Savings
258	WEST	2	STAIRWELL/CORRIDOR W2/8-2	1X4 3LF32T8 RECESSED		3	89	267	3LF32T8 841 RELAMP	0	3	89	267	4420	0	0	$ -
259	WEST	2	CLASSROOM 507	1X4 3LF32T8 RECESSED		27	89	2403	3LF32T8 841 RELAMP	0	27	89	2403	4420	0	0	$ -
260	WEST	2	WORK ROOM	1X4 2LF34T12 RECESSED		8	72	576	2LF32T8 841 RELAMP REBALLAST	80	8	48	384	4420	192	848.64	$ 127.30
261	WEST	2	OFFICE	1X4 3LF32T8 RECESSED		4	89	356	3LF32T8 841 RELAMP	0	4	89	356	4420	0	0	$ -
262	WEST	2	CLASSROOM 506	1X4 3LF32T8 RECESSED		30	89	2670	3LF32T8 841 RELAMP	0	30	89	2670	4420	0	0	$ -
263	WEST	2	CLASSROOM 504 - DARK ROOM	75W A-19 INC		1	75	75	25W CFL	0	1	25	25	4420	50	221	$ 33.15
264	WEST	2	CLASSROOM 504 - DARK ROOM	25W INC RED		1	25	25	NO CHANGE	0	1	25	25	4420	0	0	$ -
265	WEST	2	STORAGE/ELECTRICAL ROOM	1X4 2LF34T12 RECESSED		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
266	WEST	2	CLASSROOM 503	1X4 3LF32T8 RECESSED		15	89	1335	3LF32T8 841 RELAMP	0	15	89	1335	4420	0	0	$ -
267	WEST	2	CLASSROOM 502	1X4 3LF32T8 RECESSED		15	89	1335	3LF32T8 841 RELAMP	0	15	89	1335	4420	0	0	$ -
268	WEST	2	CLASSROOM 501	1X4 3LF32T8 RECESSED		15	89	1335	3LF32T8 841 RELAMP	0	15	89	1335	4420	0	0	$ -
269	WEST	2	CLASSROOM 500	1X4 3LF32T8 RECESSED		20	89	1780	3LF32T8 841 RELAMP	0	20	89	1780	4420	0	0	$ -
270	WEST	2	W226	1X4 2LF34T12 RECESSED	100	8	72	576	2LF32T8 841 RELAMP REBALLAST	80	8	48	384	4420	192	848.64	$ 127.30
271	WEST	2	FAN ROOM B	75W A-19 INC		2	75	150	25W CFL	0	2	25	50	4420	100	442	$ 66.30
272	WEST	2	FAN ROOM B	2LF34T12 4FT STRIP, CHAIN MTD		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
273	WEST	2	FAN ROOM B	2LF96T12 8FT STRIP, CHAIN MTD		1	123	123	NEW 4LF32T8 8FT STRIP	20	1	95	95	4420	28	123.76	$ 18.56
274	WEST	2	FAN ROOM B	150W A-23 INC		2	150	300	42W CFL	0	2	42	84	4420	216	954.72	$ 143.21
275	WEST	2	CLASSROOM 505	1X4 2LF34T12 RECESSED	40	20	72	1440	2LF32T8 841 RELAMP REBALLAST	200	20	48	960	4420	480	2121.6	$ 318.24
276	WEST	2	CLASSROOM 505	75W INC FLOOD		10	75	750	23W CFL FLOOD PAR 38	0	10	23	230	4420	520	2298.4	$ 344.76
277	WEST	2	CLASSROOM 506	1X4 2LF34T12 RECESSED		14	72	1008	2LF32T8 841 RELAMP REBALLAST	140	14	48	672	4420	336	1485.12	$ 222.77
278	WEST	2	CONTROL ROOM	1X4 3LF34T12 RECESSED		4	115	460	3LF32T8 841 RELAMP REBALLAST	80	4	71	284	4420	176	777.92	$ 116.69
279	WEST	2	CLASSROOM 508 - TV STUDIO	1X4 3LF32T8 RECESSED		10	89	890	3LF32T8 841 RELAMP	0	10	89	890	4420	0	0	$ -
280	WEST	2	CUSTODIAN CLOSET	75W A-19 INC		1	75	75	25W CFL	0	1	25	25	4420	50	221	$ 33.15
281	WEST	2	GIRLS TOILET	1X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
282	WEST	2	GIRLS TOILET	1X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
283	WEST	2	MENS TOILET	1X8 4LF32T8 RECESSED		1	112	112	4LF32T8 841 RELAMP	0	1	112	112	4420	0	0	$ -
284	WEST	2	MENS TOILET	2LF34T12 4FT VANITY		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
285	WEST	2	CLASSROOM 510 - LAB	1X4 3LF34T12 RECESSED		27	115	3105	3LF32T8 841 RELAMP REBALLAST	540	27	71	1917	4420	1188	5250.96	$ 787.64
286	WEST	2	WORK ROOM	1X4 3LF32T8 RECESSED		7	89	623	3LF32T8 841 RELAMP	0	7	89	623	4420	0	0	$ -
287	WEST	2	WORK ROOM - STORAGE #1	1X4 2LF34T12 RECESSED		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
288	WEST	2	WORK ROOM - STORAGE #2	1X4 2LF34T12 RECESSED		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
289	WEST	2	CLASSROOM 511	1X4 2LF32T8 RECESSED		27	61	1647	2LF32T8 841 RELAMP	0	27	61	1647	4420	0	0	$ -
290	WEST	2	FAN ROOM A	75W A-19 INC		3	75	225	25W CFL	0	3	25	75	4420	150	663	$ 99.45
291	WEST	2	FAN ROOM A	2LF34T12 4FT STRIP		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
292	WEST	2	FAN ROOM A	2LF96T12 8FT STRIP, CHAIN MTD		1	123	123	NEW 4LF32T8 8FT STRIP	20	1	95	95	4420	28	123.76	$ 18.56
293	WEST	2	LIBRARY	MH400 PEND MTD		30	458	13740	NEW 6LF32T8 HIGH BAY DECORATIVE	3060	30	224	6720	4420	7020	31028.4	$ 4,654.26
294	WEST	2	LIBRARY - AUDIO VISUAL	1X4 2LF34T12 RECESSED		9	72	648	2LF32T8 841 RELAMP REBALLAST	90	9	48	432	4420	216	954.72	$ 143.21

LN #	BLDG	FL #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Total Fix Wt Saved	KWh Saved	Annual Elec. Savings
295	WEST	2	LIBRARY - MEDIA SPEC	1X4 2LF34T12 RECESSED		6	72	432	2LF32T8 841 RELAMP REBALLAST	60	6	48	288	4420	144	636.48	$ 95.47
296	WEST	2	LIBRARY - LAPTOP STORAGE	1X4 2LF34T12 RECESSED		5	72	360	2LF32T8 841 RELAMP REBALLAST	50	5	48	240	4420	120	530.4	$ 79.56
297	WEST	2	LIBRARY - OFFICE	1X4 2LF34T12 RECESSED		17	72	1224	2LF32T8 841 RELAMP REBALLAST	170	17	48	816	4420	408	1803.36	$ 270.50
298	WEST	2	LIBRARY - OFFICE/KITCHEN	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
299	WEST	2	LIBRARY - OFFICE/KITCHEN	2LF32T8 4FT STRIP, CHAIN MTD		1	61	61	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	6	26.52	$ 3.98
300	WEST	2	LIBRARY - OFFICE/ TECH EDUCATION	1X4 2LF34T12 RECESSED		9	72	648	2LF32T8 841 RELAMP REBALLAST	90	9	48	432	4420	216	954.72	$ 143.21
301	WEST	2	LIBRARY - HALLWAY	1X4 2LF34T12 RECESSED		3	72	216	2LF32T8 841 RELAMP REBALLAST	30	3	48	144	4420	72	318.24	$ 47.74
302	WEST	2	LIBRARY - CONFERENCE ROOM	1X4 2LF34T12 RECESSED		11	72	792	2LF32T8 841 RELAMP REBALLAST	110	11	48	528	4420	264	1166.88	$ 175.03
303	WEST	2	LIBRARY - OFFICE	1X4 2LF34T12 RECESSED		6	72	432	2LF32T8 841 RELAMP REBALLAST	60	6	48	288	4420	144	636.48	$ 95.47
304	WEST	2	LIBRARY - CONFERENCE ROOM	1X4 2LF34T12 RECESSED		6	72	432	2LF32T8 841 RELAMP REBALLAST	60	6	48	288	4420	144	636.48	$ 95.47
305	WEST	2	LIBRARY - WORK ROOM	1X4 2LF34T12 RECESSED		11	72	792	2LF32T8 841 RELAMP REBALLAST	110	11	48	528	4420	264	1166.88	$ 175.03
306	WEST	2	LIBRARY - OFFICE	1X4 2LF34T12 RECESSED		9	72	648	2LF32T8 841 RELAMP REBALLAST	90	9	48	432	4420	216	954.72	$ 143.21
307	WEST	1	CORRIDOR	1X4 2LF32T8 RECESSED	16	105	61	6405	2LF32T8 841 RELAMP	0	105	61	6405	4420	0	0	$ -
308	WEST	1	CASE #1	2LF40T12 4FT STRIP 40W		4	100	400	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	208	919.36	$ 137.90
309	WEST	1	CASE #2	2LF40T12 4FT STRIP 40W		4	100	400	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	208	919.36	$ 137.90
310	WEST	1	CASE #3	2LF40T12 4FT STRIP 40W		4	100	400	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	208	919.36	$ 137.90
311	WEST	1	CASE #4	2LF40T12 4FT STRIP 40W		4	100	400	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	208	919.36	$ 137.90
312	WEST	1	BOYS TOILET	1X8 4LF34T12 RECESSED		1	144	144	4LF32T8 841 RELAMP REBALLAST	20	1	95	95	4420	49	216.58	$ 32.49
313	WEST	1	CUSTODIAN CLOSET	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
314	WEST	1	GIRLS TOILET	2LF34T12 4FT VANITY		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
315	WEST	1	GIRLS TOILET	1X8 4LF34T12 RECESSED	42	1	144	144	4LF32T8 841 RELAMP REBALLAST	20	1	95	95	4420	49	216.58	$ 32.49
316	WEST	1	FACULTY ROOM	1X4 3LF32T8 RECESSED	68	13	89	1157	3LF32T8 841 RELAMP	0	13	89	1157	4420	0	0	$ -
317	WEST	1	MENS TOILET	2LF34T12 4FT VANITY	35	1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
318	WEST	1	MENS TOILET	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
319	WEST	1	WOMENS FACULTY TOILET	2LF34T12 4FT VANITY	35	1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
320	WEST	1	WOMENS FACULTY TOILET	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
321	WEST	1	CLASSROOM 409	1X4 3LF32T8 RECESSED		13	89	1157	3LF32T8 841 RELAMP	0	13	89	1157	4420	0	0	$ -
322	WEST	1	CLASSROOM 409	1X4 2LF34T12 RECESSED	70	12	72	864	2LF32T8 841 RELAMP REBALLAST	120	12	48	576	4420	288	1272.96	$ 190.94
323	WEST	1	OFFICE	1X4 2LF34T12 RECESSED		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
324	WEST	1	CLOSET	1X4 2LF34T12 RECESSED		5	72	360	2LF32T8 841 RELAMP REBALLAST	50	5	48	240	4420	120	530.4	$ 79.56
325	WEST	1	LECTURE ROOM	2X2 4LF20T12 U SURFACE MOUNTED BOX		26	102	2652	3LF17T8 841 RELAMP REBALLAST W/REFLECTOR	0	26	47	1222	4420	1430	6320.6	$ 948.09
326	WEST	1	LECTURE ROOM	2X2 2LF34T12 U SURFACE MOUNTED BOX		4	72	288	3LF17T8 841 RELAMP REBALLAST W/REFLECTOR	0	4	47	188	4420	100	442	$ 66.30
327	WEST	1	LECTURE ROOM - STORAGE	2LF34T12 4FT SURFACE MOUNTED BOX		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
328	WEST	1	ATHLETIC DIRECTOR	1X4 2LF34T12 RECESSED	52	6	72	432	2LF32T8 841 RELAMP REBALLAST	60	6	48	288	4420	144	636.48	$ 95.47
329	WEST	1	STORAGE	100W A-19 INC CHINA HAT	12	2	100	200	NEW 4LF32T8 8FT STRIP, PEND MTD	0	2	95	190	4420	10	44.2	$ 6.63
330	WEST	1	BOILER ROOM - ENTRY	100W A-19 INC CHINA HAT		1	100	100	NEW 2LF32T8 4FT VAPOR TITE	0	1	73	73	4420	27	119.34	$ 17.90
331	WEST	1	BOILER ROOM - OPEN	100W A-19 INC CHINA HAT		7	100	700	NEW 2LF32T8 4FT VAPOR TITE	0	7	73	511	4420	189	835.38	$ 125.31

LN #	BLDG	FL. #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Total Fix Wt Saved	KWh Saved	Annual Elec Savings
332	WEST	1	BOILER ROOM - OPEN	2LF34T12 4FT WRAP		8	72	576	2LF32T8 841 RELAMP REBALLAST	60	8	48	384	4420	192	848.64	$ 127.30
333	WEST	1	BOILER ROOM - TOILET	1X2 2LF20T12 2FT RECESSED		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
334	WEST	1	BOILER ROOM - TOILET	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
335	WEST	1	BOYS TOILET	2LF34T12 4FT VANITY		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
336	WEST	1	BOYS TOILET	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
337	WEST	1	GIRLS LOCKER - TOILET	2LF34T12 4FT VANITY		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
338	WEST	1	GIRLS LOCKER - TOILET	1X4 3LF32T8 RECESSED	42	1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
339	WEST	1	GIRLS LOCKER - OFFICE	1X4 3LF32T8 RECESSED		3	72	216	2LF32T8 841 RELAMP REBALLAST	30	3	48	144	4420	72	318.24	$ 47.74
340	WEST	1	GIRLS LOCKER - OFFICE TOILET	2LF20T12 2FT VANITY		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
341	WEST	1	GIRLS LOCKER - OFFICE TOILET	1X4 3LF32T8 RECESSED	53	1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
342	WEST	1	GIRLS LOCKER - OPEN	MH250 PULSE START WITH LINEAR REACTOR BALLAS		8	295	2360	NEW 2LF32T8 4FT VAPOR TITE	0	8	73	584	4420	1776	7849.92	$ 1,177.49
343	WEST	1	GIRLS LOCKER - SHOWERS #1	100W A-19 INC RCL		4	100	400	NEW 2x26W CFL SURFACE	0	4	52	208	4420	192	848.64	$ 127.30
344	WEST	1	GIRLS LOCKER - SHOWERS #2	100W A-19 INC RCL		2	100	200	NEW 2x26W CFL SURFACE	0	2	52	104	4420	96	424.32	$ 63.65
345	WEST	1	GIRLS LOCKER - OPEN	100W A-19 INC RCL		1	100	100	NEW 2x26W CFL SURFACE	0	1	52	52	4420	48	212.16	$ 31.82
346	WEST	1	GIRLS LOCKER - TROPHY STORAGE	MH250 PULSE START WITH LINEAR REACTOR BALLAS		1	295	295	NEW 2LF32T8 4FT VAPOR TITE	0	1	73	73	4420	222	981.24	$ 147.19
347	WEST	1	GIRLS LOCKER - TROPHY STORAGE	2LF34T12 4FT SURFACE MOUNTED BOX	30	2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
348	WEST	1	GIRLS LOCKER - EXITS	EXITS INC 30W SS		4	30	120	NEW LED EXIT	0	4	2	8	8760	112	981.12	$ 147.17
349	WEST	1	GYMNASIUM #1	MH400 PEND MTD		14	459	6412	NEW 6LF32T8 GYM BAY	1400	14	224	3136	4420	3276	14479.92	$ 2,171.99
350	WEST	1	GYMNASIUM #2	MH400 PEND MTD		14	459	6412	NEW 6LF32T8 GYM BAY	1400	14	224	3136	4420	3276	14479.92	$ 2,171.99
351	WEST	1	GYMNASIUM #1 & #2 EXITS WITH CAGE	EXITS 30W WITH CAGE		8	30	240	NEW LED EXIT	0	8	2	16	8760	224	1962.24	$ 294.34
352	WEST	1	BOYS LOCKER ROOM - TOILET	1X4 3LF32T8 RECESSED		1	89	89	3LF32T8 841 RELAMP	0	1	89	89	4420	0	0	$ -
353	WEST	1	BOYS LOCKER ROOM - TOILET	2LF34T12 4FT VANITY	44	1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
354	WEST	1	BOYS LOCKER ROOM - OPEN	MH250 PULSE START WITH LINEAR REACTOR BALLAS		5	295	1475	NEW 2LF32T8 4FT VAPOR TITE	250	5	73	365	4420	1110	4906.2	$ 735.93
355	WEST	1	BOYS LOCKER ROOM - OPEN	MH250 PULSE START WITH LINEAR REACTOR BALLAS		4	295	1180	NEW 2LF32T8 4FT VAPOR TITE	200	4	73	292	4420	888	3924.96	$ 588.74
356	WEST	1	BOYS LOCKER ROOM - GOLF STORAGE #1	4LF34T12 8FT STRIP		1	144	144	NEW 4LF32T8 8FT VAPOR TIGHT	20	1	95	95	4420	49	216.58	$ 32.49
357	WEST	1	BOYS LOCKER ROOM - GOLF STORAGE #2	2LF34T12 4FT SURFACE MOUNTED BOX	39	2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
358	WEST	1	BOYS LOCKER ROOM - OFFICE	1X4 3LF34T12 RECESSED		3	115	345	3LF32T8 841 RELAMP REBALLAST	60	3	71	213	4420	132	583.44	$ 87.52
359	WEST	1	BOYS LOCKER ROOM - EXITS SS	EXITS INC 30W SS		2	30	60	NEW LED EXIT	0	2	2	4	8760	56	490.56	$ 73.58
360	WEST	1	BOYS LOCKER ROOM - ATHLETIC TRAINING ROOM	1X4 2LF34T12 RECESSED	32	2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
361	WEST	1	BOYS LOCKER ROOM - OPEN	1X4 3LF34T12 RECESSED		5	115	575	3LF32T8 841 RELAMP REBALLAST	100	5	71	355	4420	220	972.4	$ 145.86
362	WEST	1	BOYS LOCKER ROOM - LOCKER ROOM	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
363	WEST	1	BOYS LOCKER ROOM - LOCKER ROOM	2LF20T12 2FT VANITY		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
364	WEST	1	BOYS LOCKER ROOM - TOILET	2LF32T8 4FT WRAP		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
365	WEST	1	OFFICE	1X4 3LF34T12 RECESSED		5	115	575	3LF32T8 841 RELAMP REBALLAST	100	5	71	355	4420	220	972.4	$ 145.86
366	WEST	1	TEAM ROOM - ENTRY	MH250 PULSE START WITH LINEAR REACTOR BALLAS		1	295	295	NEW 2LF32T8 4FT VAPOR TITE	50	1	73	73	4420	222	981.24	$ 147.19
367	WEST	1	TEAM ROOM - OPEN	MH250 PULSE START WITH LINEAR REACTOR BALLAS		7	295	2065	NEW 2LF32T8 4FT VAPOR TITE	350	7	73	511	4420	1554	6868.68	$ 1,030.30
368	WEST	1	TEAM ROOM - OPEN	MH250 PULSE START WITH LINEAR REACTOR BALLAS		3	295	885	NEW 2LF32T8 4FT VAPOR TITE	150	3	73	219	4420	666	2943.72	$ 441.56

UNI #	BLDG	FL. #	Room Description	Existing Fixture Description	Light Level	Exist Qty.	Exist Fix Wts	Total Fix Wts	Replacement Fixture Description	NU Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Total Fix Wt Saved	KWh Saved	Annual Elec Savings
369	WEST	1	TEAM ROOM - OPEN	MH250 PULSE START WITH LINEAR REACTOR BALLAS		6	295	1770	NEW 2LF32T8 4FT VAPOR TITE	300	6	73	438	4420	1332	5887.44	$ 893.12
370	WEST	1	TEAM ROOM - SHOWERS	100W A-19 INC RCL		5	100	500	NEW 2x26W CFL SURFACE	0	5	52	260	4420	240	1060.8	$ 160.12
371	WEST	1	TEAM ROOM - TOILET	1X4 3LF32T8 RECESSED		1	89	89	3LF32T8 841 RELAMP	0	1	89	89	4420	0	0	$ -
372	WEST	1	TEAM ROOM - ENTRY	MH250 PULSE START WITH LINEAR REACTOR BALLAS		1	295	295	NEW 2LF32T8 4FT VAPOR TITE	50	1	73	73	4420	222	981.24	$ 147.19
373	WEST	1	TEAM ROOM - EXITS SS	EXITS INC 20W SS		3	30	90	NEW LED EXIT	0	3	2	6	8760	84	735.84	$ 110.38
374	WEST	1	TEAM ROOM - EQUIP ROOM	2LF34T12 4FT SURFACE MOUNTED BOx		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
375	WEST	1	TEAM ROOM - DRYING ROOM	100W A-19 INC RCL		4	100	400	NEW 2x26W CFL SURFACE	0	4	52	208	4420	192	848.64	$ 127.30
376	WEST	1	OFFICE	1X4 2LF32T8 RECESSED		3	61	183	2LF32T8 841 RELAMP	0	3	61	183	4420	0	0	$ -
377	WEST	1	STORAGE - UNIFORMS	100W A-19 INC CHINA HAT		4	100	400	NEW 2LF32T8 4FT VAPOR TITE	0	4	73	292	4420	108	477.36	$ 71.60
378	WEST	1	STORAGE - LACROSSE	100W A-19 INC CHINA HAT		4	100	400	NEW 2LF32T8 4FT VAPOR TITE	0	4	73	292	4420	108	477.36	$ 71.60
379	WEST	1	CLASSROOM 411 - AUTOSHOP	1X4 2LF32T8 RECESSED		22	61	1342	2LF32T8 841 RELAMP	0	22	61	1342	4420	0	0	$ -
380	WEST	1	CLASSROOM 411 - OFFICE	1X4 2LF32T8 RECESSED	69	6	61	366	2LF32T8 841 RELAMP	0	6	61	366	4420	0	0	$ -
381	WEST	1	CLASSROOM 411 - STORAGE	4LF34T12 8FT SURFACE MOUNTED BOX		2	144	288	NEW 4LF32T8 8FT WRAP	40	2	95	190	4420	98	433.16	$ 64.97
382	WEST	1	CLASSROOM 409 - AUTOMOTIVE LAB	1X4 3LF32T8 RECESSED	63	18	72	1296	2LF32T8 841 RELAMP REBALLAST	180	18	48	864	4420	432	1909.44	$ 286.42
383	WEST	1	CLASSROOM 402 - STORAGE 1	3LF34T12 4FT SURFACE MOUNTED BOX CHANNATO		3	115	345	NEW 2LF32T8 4FT VAPOR TITE	30	3	73	219	4420	126	556.92	$ 83.54
384	WEST	1	CLASSROOM 402 - STORAGE 2	1X4 3LF34T12 RECESSED		6	115	690	3LF32T8 841 RELAMP REBALLAST	120	6	71	426	4420	264	1166.88	$ 175.03
385	WEST	1	GUIDANCE OFFICE - OPEN	1X4 3LF32T8 RECESSED		9	89	801	3LF32T8 841 RELAMP	0	9	89	801	4420	0	0	$ -
386	WEST	1	GUIDANCE OFFICE - COPY	1X4 2LF32T8 RECESSED	69	4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
387	WEST	1	GUIDANCE OFFICE - OFFICE #1	1X4 2LF32T8 RECESSED		6	61	366	2LF32T8 841 RELAMP	0	6	61	366	4420	0	0	$ -
388	WEST	1	GUIDANCE OFFICE - OFFICE #2	1X4 2LF32T8 RECESSED		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
389	WEST	1	GUIDANCE OFFICE - OFFICE #3	1X4 2LF32T8 RECESSED		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
390	WEST	1	GUIDANCE OFFICE - OFFICE #4	1X4 2LF32T8 RECESSED		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
391	WEST	1	GUIDANCE OFFICE - OFFICE #5	1X4 2LF32T8 RECESSED		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
392	WEST	1	GUIDANCE OFFICE - OFFICE #6	1X4 2LF32T8 RECESSED		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
393	WEST	1	GUIDANCE OFFICE - OFFICE #7	1X4 2LF32T8 RECESSED		4	61	244	2LF32T8 841 RELAMP	0	4	61	244	4420	0	0	$ -
394	WEST	1	BOARD OFFICE - ENTRY	100W A-19 INC RCL	35	1	100	100	NEW 2x26W CFL SURFACE	0	1	52	52	4420	48	212.16	$ 31.82
395	WEST	1	BOARD OFFICE - OPEN	1X4 2LF32T8 RECESSED	40	12	61	732	2LF32T8 841 RELAMP	0	12	61	732	4420	0	0	$ -
396	WEST	1	BOARD OFFICE - COPY	1X4 2LF32T8 RECESSED	59	2	61	122	2LF32T8 841 RELAMP	0	2	61	122	4420	0	0	$ -
397	WEST	1	BOARD OFFICE - BUSINESS ADMIN OFFICE	1X4 3LF32T8 RECESSED		9	89	801	3LF32T8 841 RELAMP	0	9	89	801	4420	0	0	$ -
398	WEST	1	BOARD OFFICE - TOILET	2LF20T12 2FT VANITY		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
399	WEST	1	SUPERINTENDANT OFFICE - OPEN	1X4 2LF32T8 RECESSED		10	61	610	2LF32T8 841 RELAMP	0	10	61	610	4420	0	0	$ -
400	WEST	1	SUPERINTENDANT OFFICE - OFFICE	1X4 2LF32T8 RECESSED		8	61	488	2LF32T8 841 RELAMP	0	8	61	488	4420	0	0	$ -
401	WEST	1	SUPERINTENDANT OFFICE - CONFERENCE ROOM	1X4 2LF32T8 RECESSED		10	61	610	2LF32T8 841 RELAMP	0	10	61	610	4420	0	0	$ -
402	WEST	1	SUPERINTENDANT OFFICE - KITCHEN	1X4 2LF32T8 RECESSED		1	61	61	2LF32T8 841 RELAMP	0	1	61	61	4420	0	0	$ -
403	WEST	1	SUPERINTENDANT OFFICE - STORAGE	1X4 2LF32T8 RECESSED		2	61	122	2LF32T8 841 RELAMP	0	2	61	122	4420	0	0	$ -
404	WEST	1	LANCER SHOP - OPEN	1X4 3LF34T12 RECESSED	42	7	115	805	3LF32T8 841 RELAMP REBALLAST	140	7	71	497	4420	309	1361.36	$ 204.20
405	WEST	1	LANCER SHOP - TRACK LIGHTS	75W INC FLOOD		8	75	600	23W CFL FLOOD PAR 38	0	8	23	184	4420	416	1838.72	$ 275.81

LN #	BLDG	Fl. #	Room Description	Existing Fixture Description	Light Level	Exist. Qty.	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Total Fix Wt Hours	Total Fix Wt Saved	KWh Saved	Annual Elec. Savings
406	WEST	1	LANGER SHOP - CLOSET	1X8 2LF34T12 RECESSED		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
407	WEST	1	CLASSROOM 407	1X4 3LF32T8 RECESSED		15	89	1335	3LF32T8 841 RELAMP	0	15	89	1335	4420	0	0	$ -
408	WEST	1	CLASSROOM 408 - OPEN	1X4 3LF34T12 RECESSED	40	24	115	2760	3LF32T8 841 RELAMP REBALLAST	480	24	71	1704	4420	1056	4667.52	$ 700.13
409	WEST	1	CLASSROOM 409 - STORAGE	1X4 3LF34T12 RECESSED		4	115	460	3LF32T8 841 RELAMP REBALLAST	80	4	71	284	4420	176	777.92	$ 116.69
410	WEST	1	CLASSROOM 406 - OFFICE	1X4 3LF34T12 RECESSED		4	115	460	3LF32T8 841 RELAMP REBALLAST	80	4	71	284	4420	176	777.92	$ 116.69
411	WEST	1	CLASSROOM 405	1X4 2LF32T8 RECESSED		14	61	854	2LF32T8 841 RELAMP	0	14	61	854	4420	0	0	$ -
412	WEST	1	CLASSROOM 405	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
413	WEST	1	CLASSROOM 404	1X4 3LF32T8 RECESSED		15	89	1335	3LF32T8 841 RELAMP	0	15	89	1335	4420	0	0	$ -
414	WEST	1	CLASSROOM 403	1X4 3LF32T8 RECESSED		14	89	1246	3LF32T8 841 RELAMP	0	14	89	1246	4420	0	0	$ -
415	WEST	1	CLASSROOM 403	1X4 3LF34T12 RECESSED		1	115	115	3LF32T8 841 RELAMP REBALLAST	20	1	71	71	4420	44	194.48	$ 29.17
416	WEST	1	STORAGE	1X4 2LF34T12 RECESSED		6	72	432	2LF32T8 841 RELAMP REBALLAST	60	6	48	288	4420	144	636.48	$ 95.47
417	WEST	1	GUIDANCE COMPUTER ROOM	1X4 2LF34T12 RECESSED		8	72	576	2LF32T8 841 RELAMP REBALLAST	80	8	48	384	4420	192	848.64	$ 127.30
418	WEST	1	CLASSROOM 401	1X4 3LF34T12 RECESSED		18	115	2070	3LF32T8 841 RELAMP REBALLAST	360	18	71	1278	4420	792	3500.64	$ 525.10
419	WEST	1	CLASSROOM 401 - CLOSET	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
420	WEST	1	CLASSROOM 400	2X4 3LF32T8 RECESSED		18	89	1602	3LF32T8 841 RELAMP	0	18	89	1602	4420	0	0	$ -
421	WEST	1	ELEVATOR ROOM	100W A-19 INC		1	100	100	25W CFL	0	1	25	25	4420	75	331.5	$ 49.73
422	WEST	1	NURSES OFFICE - ENTRY	1X4 2LF32T8 RECESSED		3	61	183	2LF32T8 841 RELAMP	0	3	61	183	4420	0	0	$ -
423	WEST	1	NURSES OFFICE - OFFICE	1X4 3LF32T8 RECESSED		9	89	801	3LF32T8 841 RELAMP	0	9	89	801	4420	0	0	$ -
424	WEST	1	NURSES OFFICE - STORAGE	100W A-19 INC RCL		2	100	200	25W CFL	0	2	25	50	4420	150	663	$ 99.45
425	WEST	1	NURSES OFFICE - TOILET	2LF20T12 2FT VANITY		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
426	WEST	1	NURSES OFFICE - PATIENT ROOM	1X4 2LF32T8 RECESSED		2	61	122	2LF32T8 841 RELAMP	0	2	61	122	4420	0	0	$ -
427	WEST	1	NURSES OFFICE - PATIENT ROOM/TOILET	2LF20T12 2FT VANITY		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
428	WEST	1	STORAGE ROOM	1X4 2LF34T12 RECESSED		2	72	144	2LF32T8 841 RELAMP REBALLAST	20	2	48	96	4420	48	212.16	$ 31.82
429	WEST	1	CLASSROOM 416	1X4 2LF32T8 RECESSED		18	61	1098	2LF32T8 841 RELAMP	0	18	61	1098	4420	0	0	$ -
430	WEST	1	CLASSROOM 415	1X4 2LF34T12 RECESSED		16	72	1256	2LF32T8 841 RELAMP REBALLAST	160	16	48	864	4420	432	1909.44	$ 286.42
431	WEST	1	STORAGE - ENTRY FILES	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
432	WEST	1	STORAGE - OPEN	1X4 2LF34T12 RECESSED		3	72	216	2LF32T8 841 RELAMP REBALLAST	30	3	48	144	4420	72	318.24	$ 47.74
433	WEST	1	BOYS TOILET	2LF20T12 2FT VANITY		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
434	WEST	1	BOYS TOILET	1X4 3LF32T8 RECESSED		2	89	178	2LF32T8 841 RELAMP	0	2	89	178	4420	0	0	$ -
435	WEST	1	GIRLS TOILET	2LF20T12 2FT VANITY		1	56	56	2LF17T8 841 RELAMP REBALLAST	10	1	31	31	4420	25	110.5	$ 16.58
436	WEST	1	GIRLS TOILET	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
437	WEST	1	CUSTODIAN CLOSET	75W A-19 INC		1	75	75	NEW 2LF32T8 4FT WRAP	0	1	55	55	4420	20	88.4	$ 13.26
438	WEST	1	CLASSROOM 413	1X4 3LF32T8 RECESSED		24	89	2136	3LF32T8 841 RELAMP	0	24	89	2136	4420	0	0	$ -
439	WEST	1	CLASSROOM 413 - CLOSET	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
440	WEST	1	OFFICE	1X4 2LF32T8 RECESSED		18	61	1098	2LF32T8 841 RELAMP	0	18	61	1098	4420	0	0	$ -
441	WEST	1	OFFICE - STORAGE CLOSET	1X4 2LF34T12 RECESSED		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
442	WEST	1	CLASSROOM 412	1X4 2LF32T8 RECESSED		36	61	2196	2LF32T8 841 RELAMP	0	36	61	2196	4420	0	0	$ -

LN #	BLDG	FL #	Room Description	Existing Fixture Description	Light Level	Exist. Qty	Exist. Fix Wts	Total Fix Wts	Replacement Fixture Description	NJ Rebate Code	Repl. Qty.	Repl. Fix Wts	Total Fix Wts	Hours	Total Fix Wts Saved	KWh Saved	Annual Elec. Savings
443	WEST	1	CLASSROOM 411	1X4 2LF32T8 RECESSED		42	61	2562	2LF32T8 841 RELAMP	0	42	61	2562	4420	0	0	$ -
444	WEST	1	CLASSROOM 411 - SERVER CLOSET	1X4 2LF34T12 RECESSED		3	72	216	2LF32T8 841 RELAMP REBALLAST	30	3	48	144	4420	72	318.24	$ 47.74
445	WEST	1	CLASSROOM 410	1X4 2LF32T8 RECESSED		42	61	2562	2LF32T8 841 RELAMP	0	42	61	2562	4420	0	0	$ -
446	WEST	S	STAIRWELL/HALL W32-2	1X4 3LF32T8 RECESSED	65	4	89	356	3LF32T8 841 RELAMP	0	4	89	356	4420	0	0	$ -
447	WEST	S	STAIRWELL/HALL W32-2	1X4 2LF34T12 RECESSED		3	72	216	2LF32T8 841 RELAMP REBALLAST	30	3	48	144	4420	72	318.24	$ 47.74
448	WEST	S	STAIRWELL/HALL W22-2	1X4 2LF34T12 RECESSED		4	72	288	2LF32T8 841 RELAMP REBALLAST	40	4	48	192	4420	96	424.32	$ 63.65
449	WEST	S	STAIRWELL/HALL W22-2	2LF34T12 4FT STRIP		1	72	72	2LF32T8 841 RELAMP REBALLAST	10	1	48	48	4420	24	106.08	$ 15.91
450	WEST	S	STAIRWELL/HALL W20-2	1X4 2LF34T12 RECESSED		3	72	216	2LF32T8 841 RELAMP REBALLAST	30	3	48	144	4420	72	318.24	$ 47.74
451	WEST	S	STAIRWELL/HALL W20-2	1X4 3LF32T8 RECESSED		3	89	267	3LF32T8 841 RELAMP	0	3	89	267	4420	0	0	$ -
								273,194					KW SAVED >>>>		75.98	343,864.54	$ 51,579.69

New Bldg: Implement DCV and Economizer by installing controllers and sensors (Not full DDC)

N/N	DESCRIPTION OF WORK	UNIT	QTY	MATERIAL PER UNIT	MATERIAL TOTAL	LABOR PER UNIT	LABOR TOTAL	TOTAL
1	Central Station PC/software	ea	-	4,925	-	630	-	-
2	Graphics setup	ea	-		-	426	-	-
3	calibration	pt			-	60	-	-
4	Start up / check out	pt	-		-	90	-	
5	Communications bus	lf	-	331	-		-	-
6	controllers	ea	8	2,625	21,000	1,650	13,200	34,200
7	Sensors	ea	50	345	17,250	214	10,700	27,950
8					-		-	-
	Other Estimated Implemontation Costs							43,994
	TOTAL							$ 106,144

Implement DCV and Economizer by installing controllers and sensors (not full DDC upgrade)

1. Price of #2 Fuel Oil, $/gal	x
2. Price of City Water, $/1000 gallons	x
3. Price of Electricity, $/kWh (blended rate)	$0.167
4. Price of the Demand of Electricity, $/kW/month	$0.000
5. Price of Natural Gas, $/therm	$1.671

	Existing Condition	Proposed System	Savings
Annual Gas Consumption, therms	110,677	108,414	2,263
Annual Electric Consumption, kWh	2,246,000	2,239,222	6,778
Annual Cost and Savings, $	$549,501	$544,813	$ 4,689

Window Shading (Awnings)

N/N	DESCRIPTION OF WORK	UNIT	QTY	MATERIAL PER UNIT	MATERIAL TOTAL	LABOR PER UNIT	LABOR TOTAL	TOTAL
1	Awning, metal and frame	lf	500	200	100,000	20	10,000	110,000
	Other Estimated Implomontation Costs							48,400
	TOTAL							$ 158,400

SAVINGS FROM WINDOW SHADING

1. Price of #2 Fuel Oil, $/gal	x
2. Price of City Water, $/1000 gallons	x
3. Price of Electricity, $/kWh (blended rate)	$0.167
4. Price of the Demand of Electricity, $/kW/month	$0.000
5. Price of Natural Gas, $/therm	$1.671

	Existing Condition	Proposed System	Savings
Annual Summer Heat Gain From Windows, 1000 BTU	35,212	24,731	10,480
Annual Winter Heat Gain From Windows 1000 BTU	281,670	242,906	-38,764
Cooling Savings, kWh		1,048	1,048
Additional Heating, Therms		-465	-465
Cooling Savings		$ 175	$ 175
Additional Heating Cost (can be avoided)*		$ (761)	$ (761)

1. Awnings transmitted solar radiation data for Newark, NJ collected by National Renewable Energy Laboratory.

2. Existing conditions assumes double pane glass with aluminum framing and no shading.

3 Assumes cooling occurs for 1/2 the days on may and September

4. * Additional heating can be avoided if the awnings are then retractable or designed to only block the summer sun and not block the winter sun

Replace Boilers with High Efficiency Modular Condensing Boilers

N/N	DESCRIPTION OF WORK	UNIT	QTY	MATERIAL PER UNIT	MATERIAL TOTAL	LABOR PER UNIT	LABOR TOTAL	TOTAL
1	Demo Existing Boiler(s)	hrs	48		-	100	4,800	4,800
2	Piping Re-Work	lf	100	47	4,700	10	1,000	5,700
3	1MMBtu Cond Boiler	ea	-	13,500	-		-	-
4	2MMBTu Cond Boiler	ea	-	20,550	-		-	-
5	3MMBTu Cond Boiler	ea	5	26,800	134,000		-	134,000
6	Install	hrs	160		-	100	16,000	16,000
	Other Estimated Implementation Costs							133,213
	TOTAL							**$ 293,713**
	NJ SmartStart Rebate							**$ 15,000**

SAVINGS FROM HIGH EFFICENCY MODULAR CONDENSING BOILERS

1. Price of #2 Fuel Oil, $/gal	x
2. Price of City Water, $/1000 gallons	x
3. Price of Electricity, $/kWh (blended rate)	$0.167
4. Price of the Demand of Electricity, $/kW/month	$0.000
5. Price of Natural Gas, $/therm	$1.571

	Existing Condition	Proposed System	Savings
Boiler Plant Capacity, kBTU	20,920	20,920	
Hours of Operation	4,049	4,049	
Seasonal Efficiency	80%	93%	13%
Annual Gas Consumption, therms	110,667	65,476	45,191
Annual Cost and Savings, $	$173,820	$102,840	**$ 70,980**

1. Assume the boilers have a temperature reset schedule where the hot water is supplied at 140F/120F when it is 0F/40F outside.

Unit Vent VFDs

N/N	DESCRIPTION OF WORK	UNIT	QTY	MATERIAL		LABOR		TOTAL
				PER UNIT	TOTAL	PER UNIT	TOTAL	
1	Fractional HP VFDs	ea	45	350	15,750	-	-	15,750
2					-		-	-
	Other Estimated Implementation Costs							5,985
	TOTAL							$ 21,735

SAVINGS FROM INSTALLING VFDS ON FCU'S AND/OR UNIVENTS - OLD BLDG

1. Price of Electricity, $/kWh (blended rate)	$0.167

	Existing Condition	Proposed System	Savings
Number of FCUs or Univents	26	26	
Fan Motor HP	0.100	0.100	
Fan Motor Efficiency	90%	90%	
Annual Operating Hours	1,980	1,980	
Annual Fan kWh	3,455	2,397	1,058
Annual Cost and Savings, $	$578	$401	$177

1. Assume Operating Hrs are 5:30am to 4:30pm for 180 days.
2. Assume 90% Fan Motor Eff.
3. Assume 0.1 Fan Motor HP.

SAVINGS FROM INSTALLING VFDS ON FCU'S AND/OR UNIVENTS - NEW BUILDING

1. Price of Electricity, $/kWh (blended rate)	$0.167

	Existing Condition	Proposed System	Savings
Number of FCUs or Univents	19	19	
Fan Motor HP	0.100	0.100	
Fan Motor Efficiency	90%	90%	
Annual Operating Hours	1,980	1,980	
Annual Fan kWh	2,525	1,752	773
Annual Cost and Savings, $	$422	$293	$129

1. Assume Operating Hrs are 5:30am to 4:30pm for 180 days.
2. Assume 90% Fan Motor Eff.
3. Assume 0.1 Fan Motor HP.

Temperature Set point Optimization

N/N	DESCRIPTION OF WORK	UNIT	QTY	MATERIAL		LABOR		TOTAL
				PER UNIT	TOTAL	PER UNIT	TOTAL	
1	Reprogram BMS	hr	20		-	48	960	960
	Other Estimated Implementation Costs							-
	TOTAL							$ 960

Space Temperature Setpoint Optimization

1. Price of #2 Fuel Oil, $/gal	x
2. Price of City Water, $/1000 gallons	x
3. Price of Electricity, $/kWh (blended rate)	$0.167
4. Price of the Demand of Electricity, $/kW/month	$0.000
5. Price of Natural Gas, $/therm	$1.571

	Existing Condition	Proposed System	Savings
Space Cooling Temperature Setting	68-80	74	$400
Space Heating Temperature Setting	65-76	70	$1,700
Annual Cost and Savings, $			$ 2,100

1. Daily run hours are based on 180 days, 11 hour days
2. Cost per cfm for respective AC unit taken from "Cost per CFM (Dx-Economizer)" sheet.
3. Assume 10,000 CFM for HVAC-1, HVAC-8, HVAC-9.
4. Assume 1,000 CFM for UV's, music room and HV-13.

Energy Star Cooler

N/N	DESCRIPTION OF WORK	UNIT	QTY	MATERIAL		LABOR		TOTAL
				PER UNIT	TOTAL	PER UNIT	TOTAL	
1	Energy Star Cooler	ea	2	3,800	7,600	-	-	7,600
	Other Estimated Implementation Costs							-
	TOTAL							$ 7,600

Walk-in Freezer and Cooler Fan Controls

N/N	DESCRIPTION OF WORK	UNIT	QTY	MATERIAL		LABOR		TOTAL
				PER UNIT	TOTAL	PER UNIT	TOTAL	
1	Install Evaporator Fan Speed Control Unit	ls	4	650	2,600	350	1,400	4,000
2					-		-	-
	Other Estimated Implementation Costs							-
	TOTAL							$ 4,000

WALK-IN FREEZER & COOLER EVAPORATOR FAN CONTROL

1. Price of #2 Fuel Oil, $/gal	x
2. Price of City Water, $/1000 gallons	x
3. Price of Electricity, $/kWh (blended rate)	$0.107
4. Price of the Demand of Electricity, $/kW/month	$0.000
5. Price of Natural Gas, $/therm	$1.571

	Existing Condition	Proposed System	Savings
Run Hours	8,760	8,760	
Evaporator Fan Heat Load, Mbtu	11,149	2,787	8,361
Evaporator Fan Power, kWh	3,267	2,124	1,144
Compressor Power to Remove Evap Fan Heat Load, kWh	1,440	360	1,080
Annual Cost and Savings, $	$ 767	$ 415	$ 372

1. Run hours based on fan motors being run 8,760 hrs

Premium Efficiency Motors

N/N	DESCRIPTION OF WORK	UNIT	QTY	MATERIAL		LABOR		TOTAL
				PER UNIT	TOTAL	PER UNIT	TOTAL	
9	Motors, dripproof, premium efficiency, 1.15 service factor, 1800 RPM, 230/460 V, 60 Hz, 7.5 HP	ea	1	$ 510	510	$ 90	90	600
11	Motors, dripproof, premium efficiency, 1.15 service factor, 1800 RPM, 230/460 V, 60 Hz, 15 HP	ea	4	$ 785	3,140	$ 118	472	3,612
15	Motors, dripproof, premium efficiency, 1.15 service factor, 1800 RPM, 230/460 V, 60 Hz, 40 HP	ea	2	$ 1,775	3,550	$ 188	376	3,926
17	Motors, dripproof, premium efficiency, 1.15 service factor, 1800 RPM, 230/460 V, 60 Hz, 60 HP	ea	2	$ 2,525	5,050	$ 269	538	5,588
35	Motors, totally enclosed, premium efficiency, 1.15 service factor, 1800 RPM, 230/460 V, 60 Hz, 7.5 HP	ea	1	$ 675	675	$ 90	90	765
					-		-	-
	Other Estimated Implementation Costs							2,896
	TOTAL							$ 17,388
	NJ SmartStart Rebate							$ 1,370

SAVINGS FROM PREMIUM EFFICIENCY MOTORS

1. Price of #2 Fuel Oil, $/gal	$
2. Price of City Water, $/1000 gallons	$
3. Price of Electricity, $/kWh (blended rate)	$0.07
4. Price of Maintenance of Electricity, $/kW/month	$0.000
5. Price of Natural Gas, $/therm	$1.071

					ESTIMATED RUN TIME		FULL LOAD NOMINAL EFFICIENCY (%)		ELECTRIC CONSUMPTION (kWh)		SAVINGS	
TAG	LOCATION	SERVICES	HP	RPM	AVG HRS	LOAD FACTOR	EXISTING	PROPOSED	EXISTING	PROPOSED	kWh	$
P-1	New Bldg. Boiler Rm	Heating Hot Water Circ Pump	40	1,800	2,674	100%	90.2%	94.1%	75,087	71,895	3,192	$ 534
P-2	New Bldg. Boiler Rm	Heating Hot Water Circ Pump	40	1,800	2,674	100%	90.2%	94.1%	75,087	71,895	3,192	$ 534
P-1	New Bldg. Boiler Rm	Chilled Water Circ Pump	50	1,800	290	100%	84.0%	95.0%	12,378	10,940	1,438	$ 240
P-2	New Bldg. Boiler Rm	Chilled Water Circ Pump	50	1,800	290	100%	84.0%	95.0%	12,378	10,940	1,438	$ 240
HVAC-3	New Bldg. Fan Rm B	HVAC-3 Supply Fan	7.5	1,800	2,760	100%	89.5%	91.7%	10,802	10,543	259	$ 43
HVAC-4	New Bldg. Fan Rm B	HVAC-4 Supply Fan	15	1,800	2,760	100%	88.0%	93.0%	21,973	20,792	1,181	$ 198
HVAC-6	New Bldg. Fan Rm B	HVAC-6 Supply Fan	15	1,800	2,760	100%	88.0%	93.0%	21,973	20,792	1,181	$ 198
HVAC-7	New Bldg. Fan Rm B	HVAC-7 Supply Fan	15	1,800	2,760	100%	88.0%	93.0%	21,973	20,792	1,181	$ 198
HVAC-8	New Bldg. Fan Rm B	HVAC-8 Supply Fan	15	1,800	2,760	100%	88.0%	93.0%	21,973	20,792	1,181	$ 198
HVAC-12	Main Bldg. Fan Rm C	HVAC-12 Supply Fan	7.5	1,800	2,760	100%	90.5%	91.0%	10,024	10,324	300	$ 50
										TOTAL	14,535	$2,431

1. Existing equipment data listed in italics were estimated due to unavailable information.
2. It is assumed that the breakhorse power of all motors is 80% of the nameplate horsepower.
3. Only the major motors were sampled for this calculations
4. Average run hours for pump motors estimated using 5,000 annual heating hours (OAT < 65 deg F). 2,323 annual cooling hours (OAT > 75 deg F)
5. Cooling hours adjusted to account for the cooling during 16 June, all of July and August, and 16 September (Lakeland doesn't run AC during summer break)
6. Average run hours for fan motors estimated using 180 days at 12 operating hours per day

Midland Regional HS
Ozone Tech
June 2007

DX Unit Energy Costs		
Cost of Gas	$	1.571 /therm
Cost of Electric	$	0.167 /per kWh
Cost per AHU CFM	$	1.025 per CFM

% Cooling Cost per CFM 77.66%
% Heating Cost per CFM 22.34%

20% OA

DX OA Cooling Costs (Economizer On)

Unit	CFM	Outside Air Temperature Wet Bulb (°F)	Outside Air Temperature Dry Bulb (°F)	Outside Air Enthalpy	Outside Air Relative Humidity	Discharge Air Temperature Dry Bulb	Discharge Air Enthalpy	Total Cooling Load (Tons)	Total Cooling kW (1.2 kW per Ton)	Hours Per Year @ Inlet Conditions	kWh	Cost based on $ per kWh
ALL DX's	-	56	62.5	23.90	55	55	22.70	0.0074	0.0006	779	0.4570	$0.76
										709	Total	$0.38

DX OA Heating Costs (Economizer On)

Unit	CFM	Outside Air Temperature Dry Bulb (°F)	Return Air Temperature Dry Bulb (°F)	% OA	OA CFM Component of Mixture Condition	Mixed Air Temperature Dry Bulb (°F)	Preheat/Coil Discharge Air Temperature	Pre-Heat Load (BTU/Hr)	Hours Per Year @ Inlet Conditions	Pre-heat Load (BTU)	Therms of gas	Cost
AC	1	57.5	74	1.00	1.00	56.0	55	7.24	728	2,329	0.02	$ 0.0378
		52.5	74	0.59	0.69	56.0	60	5.40	763	4,134	0.04	$ 0.0649
		47.5	74	0.72	0.72	56.0	54	7.68	783	5,789	0.06	$ 0.0909
		42.5	74	0.60	0.60	56.0	54	9.72	758	7,307	0.08	$ 0.1215
		37.5	74	0.52	0.52	65.4	68	1.22	688	747	0.01	$ 0.0117
		32.5	74	0.46	0.46	65.0	62	3.26	653	1,811	0.02	$ 0.0284
		27.5	74	0.41	0.41	65.0	70	5.42	315	1,701	0.02	$ 0.0267
		22.5	74	0.37	0.37	65.0	72	7.58	167	1,249	0.01	$ 0.0259
		17.5	74	0.34	0.34	65.0	74	9.72	122	951	0.01	$ 0.0149
		12.5	74	0.31	0.31	65.2	79	11.88	51	447	0.00	$ 0.0069
		7.5	74	0.29	0.29	65.0	78	14.04	19	282	0.00	$ 0.0077
		2.5	74	0.27	0.27	65.0	52	16.20	4	65	0.00	$ 0.0010
		-2.5	74	0.25	0.25	65.0	62	18.36	1	15	0.00	$ 0.0003
									4,596		Total	$0.43

AHU Return & OA Cooling Costs (Economizer Off)

Unit	CFM	Outside Air Temperature Wet Bulb (°F)	Outside Air Temperature Dry Bulb (°F)	Outside Air Enthalpy	Return Air Enthalpy (74 °F DB)	Mixed Air Enthalpy (20% OA, 80% RA)	Discharge Air Relative Humidity	Discharge Air Temperature Dry Bulb	Discharge Air Enthalpy	Total Cooling Load (Tons)	Total Cooling kW (1.2 kW per Ton)	Hours Per Year @ Inlet Conditions	kWh	Cost based on $ per kWh
AHU-1	1	82	107.5	46.56	27.52	31.2	95	55	22.70	0.0032	0.0038	9	0.0000	$0.0000
		80	102.5	43.50	27.52	30.9	96	55	22.70	0.0032	0.0038	4	0.0045	$0.0004
		76	97.5	39.45	27.52	30.4	92	55	22.70	0.0027	0.0033	33	0.1094	$0.0183
		75	92.5	38.55	27.52	29.8	92	55	22.70	0.0027	0.0022	26	0.1538	$0.0258
		73	87.5	35.78	27.52	29.2	92	55	22.70	0.0026	0.0029	243	0.7195	$0.1193
		70	82.5	34.02	27.52	28.7	93	55	22.70	0.0023	0.0018	454	1.2557	$0.2122
		68	77.5	26.42	27.52	28.0	96	55	22.70	0.0097	0.0056	567	1.7359	$0.2905
		65	77.5	32.09	27.52	28.1	95	55	21.06	0.0024	0.0029	845	2.4300	$0.4064
		61	67.5	27.14	27.52	27.5	95	55	21.06	0.3572	0.3378	787	12.0184	$2.3373
												3,722	Total	$1.44

Lakeland Regional HS
Dome Tech
June 2009

AHU w/CHW & HW Coil Energy Costs		
Cost of Gas	$ 1.571	Therm
Cost of Electric	$ 0.167	per kWhr
Cost per AHU CFM	$ 1.714	per CFM

Chiller Tons	100	100	
Chiller kW	93.956	66.95	
CHW Pump kW	37.3	37.3	
CW Pump kW	37.3	37.3	
CT Fan kW	0	0	
Total kW	168.556	171.55	
Plant Eff (kw/ton)	1.68556	1.7155	1.7009

Min Outside Air Damper Position 20%
Chiller Plant Efficiency 1.70 kw/ton
Heating Efficiency 0.80

AHU w/Pneumatic Controls

Temperature Range	BIN Hours (Newark)	OA Dry Bulb Temp (Deg F)	OA Wet Bulb Temp (Deg F)	OA Enthalpy (btu/lb)	Estimated Return Air Temp (Deg F)	Estimated Return Air RH	Return Air Enthalpy (Btu/lb)	OA Damper Position	Mixed Air Setpoint	Mixed Air Temp (Deg F)	Mixed Air Enthalpy (btu/lb)	Estimated Supply Air Temp (Deg F)	Estimated Supply Air RH	Supply Air Enthalpy (Btu/lb)	Cooling Load (ton-hrs)	kwhr	Cooling Cost per cfm	Heating Load (BTU)	Therms	Heating Cost per cfm	Cost per cfm Summary
105 to 110	0	107.5	62	46.7	75	50	28.2	20%	55	61.5	31.7	55	95	22.7	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
100 to 105	4	102.5	60	43.5	75	50	28.2	20%	55	60.5	31.3	55	95	22.7	0.0128	0.0218	$0.0037	0	0	$ -	$0.0037
95 to 100	30	97.5	70	39.4	75	50	28.2	20%	55	79.9	30.4	55	95	22.7	0.0872	0.1483	$0.0249	0	0	$ -	$0.0249
90 to 95	65	92.5	75	38.6	75	50	28.2	20%	55	78.9	30.3	55	95	22.7	0.2660	0.4563	$0.0767	0	0	$ -	$0.0767
85 to 90	243	87.5	72	35.8	75	50	28.2	20%	55	77.5	29.7	55	95	22.7	0.8362	1.0872	$0.1818	0	0	$ -	$0.1818
80 to 85	454	82.5	70	34.1	74	50	27.6	20%	55	75.7	28.9	55	95	22.7	1.0573	1.7963	$0.3006	0	0	$ -	$0.3006
75 to 80	657	77.5	68	32.4	74	50	27.6	20%	55	74.7	28.6	55	95	22.7	1.4401	2.4647	$0.4122	0	0	$ -	$0.4122
70 to 75	840	72.5	65	30.1	74	50	27.6	20%	60	73.7	28.1	60	85	24.6	1.0940	1.6808	$0.3112	0	0	$ -	$0.3112
65 to 70	767	67.5	61	27.1	74	50	27.6	100%	60	67.5	27.1	60	85	24.6	0.7200	1.1246	$0.2046	0	0	$ -	$0.2046
60 to 65	708	62.5	56	23.6	74	50	27.6	78%	60	65.0	24.8	65	75	26.4	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
55 to 60	729	57.5	51	20.8	70	50	25.4	40%	60	59.0	23.9	65	75	26.4	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
50 to 55	780	52.5	47	18.7	70	50	25.4	29%	60	55.0	23.3	65	75	26.4	0.0000	0	0	0	0	$ -	$0.0000
45 to 50	765	47.5	42	16.2	70	50	25.4	22%	60	53.0	23.3	65	75	26.4	0.0000	0	0	0	0	$ -	$0.0000
40 to 45	796	42.5	38	14.4	70	50	25.4	20%	65	64.5	23.2	65	60	24.3	0.0000	0	0	537.3	0.0054	$ 0.01	$0.0054
35 to 40	688	37.5	33	12.2	70	50	25.4	20%	65	63.5	22.7	65	60	24.3	0.0000	0	0	1393.2	0.0139	$ 0.02	$0.0216
30 to 35	559	32.5	28	10.1	70	50	25.4	20%	65	62.5	22.3	65	60	24.3	0.0000	0	0	1886.625	0.0189	$ 0.03	$0.0296
25 to 30	312	27.5	24	8.8	70	50	25.4	20%	65	61.5	22.0	65	60	24.3	0.0000	0	0	1488.375	0.0149	$ 0.02	$0.0354
20 to 25	183	22.5	19	6.8	69	50	24.3	20%	65	59.8	20.8	65	60	24.3	0.0000	0	0	1686.375	0.0169	$ 0.03	$0.0296
15 to 20	102	17.5	14	5.1	68	50	24.3	20%	65	57.8	20.2	65	60	24.3	0.0000	0	0	977.67	0.0098	$ 0.02	$0.0154
10 to 15	37	12.5	10	3.8	68	50	24.3	20%	65	56.3	20.2	65	60	24.3	0.0000	0	0	454.585	0.0045	$ 0.01	$0.0064
5 to 10	13	7.5	5	2.3	68	50	24.3	20%	65	55.3	19.9	65	60	24.3	0.0000	0	0	159.705	0.0016	$ 0.00	$0.0025
0 to 5	4	2.5	1	1.1	68	50	24.3	20%	65	54.8	19.7	65	60	24.3	0.0000	0	0	54.54	0.0005	$ 0.00	$0.0009
-5 to 0	1	-2.5	-1	0.6	68	50	24.3	20%	65	53.9	19.4	65	60	24.3	0.0000	0	0	14.985	0.0001	$ 0.00	$0.0002
																					$1.7137

Min Outside Air Damper Position 20%
Chiller Plant Efficiency 1.70 kw/ton
Heating Efficiency 0.80

AHU w/Economizer

Temperature Range	BIN Hours (Newark)	OA Dry Bulb Temp (Deg F)	OA Wet Bulb Temp (Deg F)	OA Enthalpy (btu/lb)	Estimated Return Air Temp (Deg F)	Estimated Return Air RH	Return Air Enthalpy (Btu/lb)	OA Damper Position	Mixed Air Setpoint	Mixed Air Temp (Deg F)	Mixed Air Enthalpy (btu/lb)	Estimated Supply Air Temp (Deg F)	Estimated Supply Air RH	Supply Air Enthalpy (Btu/lb)	Cooling Load (ton-hrs)	kwhr	Cooling Cost per cfm	Heating Load (BTU)	Therms	Heating Cost per cfm	Cost per cfm Summary
105 to 110	0	107.5	62	46.7	75	50	28.2	20%	55	61.5	31.7	55	95	22.7	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
100 to 105	4	102.5	60	43.5	75	50	28.2	20%	55	60.5	31.3	55	95	22.7	0.0128	0.0218	$0.0037	0	0	$ -	$0.0037
95 to 100	30	97.5	70	39.4	75	50	28.2	20%	55	79.9	30.4	55	95	22.7	0.0872	0.1483	$0.0249	0	0	$ -	$0.0249
90 to 95	65	92.5	75	38.6	75	50	28.2	20%	55	78.9	30.3	55	95	22.7	0.2660	0.4563	$0.0767	0	0	$ -	$0.0767
85 to 90	243	87.5	72	35.8	75	50	28.2	20%	55	77.5	29.7	55	95	22.7	0.8362	1.0872	$0.1818	0	0	$ -	$0.1818
80 to 85	454	82.5	70	34.1	74	50	27.6	20%	55	75.7	28.9	55	95	22.7	1.0573	1.7963	$0.3006	0	0	$ -	$0.3006
75 to 80	657	77.5	68	32.4	74	50	27.6	20%	55	74.7	28.6	55	95	22.7	1.4401	2.4647	$0.4122	0	0	$ -	$0.4122
70 to 75	840	72.5	65	30.1	74	50	27.6	20%	60	73.7	28.1	60	85	24.6	1.0940	1.6808	$0.3112	0	0	$ -	$0.3112
65 to 70	767	67.5	61	27.1	74	50	27.6	100%	60	67.5	27.1	60	85	24.6	0.7200	1.1246	$0.2046	0	0	$ -	$0.2046
60 to 65	708	62.5	56	23.6	74	50	27.6	78%	60	65.0	24.8	65	75	26.4	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
55 to 60	729	57.5	51	20.8	70	50	25.4	40%	60	59.0	23.9	65	75	26.4	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
50 to 55	780	52.5	47	18.7	70	50	25.4	29%	60	55.0	23.3	65	75	26.4	0.0000	0	0	0	0	$ -	$0.0000
45 to 50	765	47.5	42	16.2	70	50	25.4	22%	60	53.0	23.3	65	75	26.4	0.0000	0	0	0	0	$ -	$0.0000
40 to 45	796	42.5	38	14.4	70	50	25.4	20%	65	64.5	23.2	65	60	24.3	0.0000	0	0	537.3	0.0054	$ 0.01	$0.0054
35 to 40	688	37.5	33	12.2	70	50	25.4	20%	65	63.5	22.7	65	60	24.3	0.0000	0	0	1393.2	0.0139	$ 0.02	$0.0216
30 to 35	559	32.5	28	10.1	70	50	25.4	20%	65	62.5	22.3	65	60	24.3	0.0000	0	0	1886.625	0.0189	$ 0.03	$0.0296
25 to 30	312	27.5	24	8.8	70	50	25.4	20%	65	61.5	22.0	65	60	24.3	0.0000	0	0	1488.375	0.0149	$ 0.02	$0.0234
20 to 25	183	22.5	19	6.8	69	50	24.3	20%	65	59.8	20.8	65	60	24.3	0.0000	0	0	1686.375	0.0169	$ 0.03	$0.0270
15 to 20	102	17.5	14	5.1	68	50	24.3	20%	65	57.8	20.2	65	60	24.3	0.0000	0	0	977.67	0.0098	$ 0.02	$0.0154
10 to 15	37	12.5	10	3.8	68	50	24.3	20%	65	56.3	20.2	65	60	24.3	0.0000	0	0	454.585	0.0045	$ 0.01	$0.0064
5 to 10	13	7.5	5	2.3	68	50	24.3	20%	65	55.3	19.9	65	60	24.3	0.0000	0	0	159.705	0.0016	$ 0.00	$0.0025
0 to 5	4	2.5	1	1.1	68	50	24.3	20%	65	54.8	19.7	65	60	24.3	0.0000	0	0	54.54	0.0005	$ 0.00	$0.0009
-5 to 0	1	-2.5	-1	0.6	68	50	24.3	20%	65	53.9	19.4	65	60	24.3	0.0000	0	0	14.985	0.0001	$ 0.00	$0.0002
																					$1.6497

Min Outside Air Damper Position 5%
Chiller Plant Efficiency 1.70 kw/ton
Heating Efficiency 0.80

AHU w/Economizer & DCV

Temperature Range	BIN Hours (Newark)	OA Dry Bulb Temp (Deg F)	OA Wet Bulb Temp (Deg F)	OA Enthalpy (btu/lb)	Estimated Return Air Temp (Deg F)	Estimated Return Air RH	Return Air Enthalpy (Btu/lb)	OA Damper Position	Mixed Air Setpoint	Mixed Air Temp (Deg F)	Mixed Air Enthalpy (btu/lb)	Estimated Supply Air Temp (Deg F)	Estimated Supply Air RH	Supply Air Enthalpy (Btu/lb)	Cooling Load (ton-hrs)	kw/hr	Cooling Cost per cfm	Heating Load (BTU)	Therms	Heating Cost per cfm	Cost per cfm Summary
95 to 100	0	107.5	82	45.7	75	50	28.3	5%	55	76.8	26.1	55	95	22.7	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
90 to 95	4	102.5	80	45.5	75	50	28.3	5%	55	76.4	26.0	55	95	22.7	0.0004	0.0160	$0.0027	0	0	$ -	$0.0027
85 to 100	30	97.5	76	39.4	75	50	28.3	5%	55	76.1	26.0	55	95	22.7	0.0982	0.1180	$0.0194	0	0	$ -	$0.0194
90 to 95	93	92.5	73	36.8	75	50	28.3	5%	55	75.9	25.7	55	95	22.7	0.2143	0.3845	$0.0610	0	0	$ -	$0.0610
85 to 90	240	87.5	72	35.8	75	50	28.3	5%	55	75.8	25.6	55	95	22.7	0.5268	0.9110	$0.1504	0	0	$ -	$0.1504
80 to 85	464	82.5	70	34.1	74	50	27.8	5%	55	74.4	24.9	55	95	22.7	0.9927	1.5184	$0.2540	0	0	$ -	$0.2540
75 to 80	657	77.5	68	32.4	74	50	27.8	5%	55	74.3	24.9	55	95	22.7	1.3119	2.1629	$0.3618	0	0	$ -	$0.3618
70 to 75	846	72.5	63	30.1	74	50	27.8	5%	60	73.9	27.7	60	95	24.6	0.8785	1.6643	$0.2784	0	0	$ -	$0.2784
65 to 70	767	67.5	61	27.1	74	50	27.8	100%	65	67.5	27.1	60	95	24.6	-0.7700	1.2246	$0.2048	0	0	$ -	$0.2048
60 to 65	709	62.5	56	23.8	74	50	27.8	78%	65	65.0	24.6	65	75	20.4	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
55 to 60	729	57.5	51	20.8	75	50	28.4	40%	65	65.0	25.5	65	75	20.4	0.0000	0.0000	$0.0000	0	0	$ -	$0.0000
50 to 55	590	52.5	47	18.7	70	50	25.4	29%	65	65.0	23.5	65	75	20.4	0.0000	0	0	0	0	$ -	$0.0000
45 to 50	703	47.5	42	16.2	70	50	25.4	22%	65	65.0	23.3	65	75	20.4	0.0000	0	0	0	0	$ -	$0.0000
40 to 45	706	42.5	38	14.4	70	50	25.4	18%	65	65.0	23.4	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
35 to 40	688	37.5	32	12.3	70	50	25.4	15%	65	65.0	23.4	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
30 to 35	709	32.5	28	10.1	70	50	25.4	13%	65	65.0	23.3	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
25 to 30	315	27.5	24	8.6	70	50	25.4	12%	65	65.0	23.4	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
20 to 25	160	22.5	19	6.8	68	50	24.3	7%	65	65.0	22.2	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
15 to 20	102	17.5	14	5.1	68	50	24.3	6%	65	65.0	22.2	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
10 to 15	37	12.5	10	3.8	68	50	24.3	5%	65	65.0	22.2	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
5 to 10	13	7.5	5	2.3	68	50	24.3	5%	65	65.0	22.2	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
0 to 5	4	2.5	1	1.1	68	50	24.3	5%	65	65.0	22.2	65	80	24.3	0.0000	0	0	0	0	$ -	$0.0000
-5 to 0	1	-2.5	-3	0.0	68	50	24.3	5%	65	64.5	22.1	65	80	24.3	0.0000	0	0	5.7567%	7.09E-06	$ 0.00	$0.0000
																					$1.3343

Lakeland Regional HS
Dome Tank
June 2009

HV Unit Energy Costs			
Cost of Gas	$	1.571	Therm
Cost of Electric	$	0.167	per kWh
Cost per AHU CFM	**$**	**0.923**	**per CFM**

Min Outside Air Damper Position 50%
Heating Efficiency 0.80

HV Unit w/Pneumatic Controls

Temperature Range	BIN Hours (Newark)	OA Dry Bulb Temp (Deg F)	OA Wet Bulb Temp (Deg	OA Enthalpy (btu/lb)	OA RH	Estimated Return Air Temp (Deg F)	Estimated Return Air RH	Return Air Enthalpy (Btu/lb)	OA Damper Position	Mixed Air Setpoint	Mixed Air Temp (Deg F)	Mixed Air Enthalpy (btu/lb)	Estimated Supply Air Temp (Deg F)	Estimated Supply Air RH	Supply Air Enthalpy (Btu/lb)	Heating Load (BTU)	Therms	Heating Cost per cfm	Cost per cfm Summary
95 to 100	0	107.5	62	45.7	34.7	75	50	28.2	50%	81	81.3	38.9	91.25	42.33	36.6	0	0	$ -	$0.0000
90 to 95	4	102.5	60	43.8	38.3	75	50	28.2	50%	80	80.8	35.9	88.75	44.18	35.5	0	0	$ -	$0.0000
85 to 100	30	97.5	76	39.4	38.0	75	50	28.2	50%	68	68.3	33.8	86.25	43.66	33.7	0	0	$ -	$0.0000
90 to 95	95	92.5	75	38.5	45.1	75	50	28.2	50%	64	63.8	32.4	83.75	47.93	33.1	0	0	$ -	$0.0000
85 to 90	242	87.5	72	35.8	47.8	75	50	28.2	50%	61	61.3	32.0	81.25	48.93	31.8	0	0	$ -	$0.0000
80 to 85	404	82.5	70	34.1	54.3	74	50	27.6	50%	76	76.3	36.8	76.75	53.14	30.7	0	0	$ -	$0.0000
75 to 80	657	77.5	68	32.4	62.0	74	50	27.6	50%	76	75.8	30.0	76.76	58.01	29.9	0	0	$ -	$0.0000
70 to 75	840	72.5	65	30.1	67.4	74	50	27.6	50%	73	73.3	28.8	73.25	58.68	28.9	0	0	$ -	$0.0000
65 to 70	767	67.5	61	27.1	69.3	74	50	27.6	50%	71	70.8	27.4	70.75	59.66	27.5	0	0	$ -	$0.0000
60 to 65	709	62.5	58	25.8	68.8	74	50	27.6	50%	68	68.3	26.7	68.25	58.42	25.8	0	0	$ -	$0.0000
55 to 60	724	57.5	51	20.8	63.3	70	50	25.4	50%	65	63.8	23.1	65	75	24.4	1703.5	0.017035	$ 0.02	$0.0163
50 to 55	760	52.5	47	18.7	67.6	70	50	25.4	50%	62	61.3	22.1	65	76	24.4	3647.5	0.036475	$ 0.06	$0.0604
45 to 50	763	47.5	42	16.3	69.5	70	50	25.4	50%	65	56.8	20.8	65	75	26.4	6437.813	0.064378	$ 0.10	$0.1011
40 to 45	594	42.5	38	14.4	68.5	70	50	25.4	50%	65	56.3	19.9	65	80	24.5	9402.75	0.094028	$ 0.15	$0.1477
35 to 40	689	37.5	33	12.7	70.1	70	50	25.4	50%	65	53.8	18.8	65	80	24.5	10449	0.10449	$ 0.16	$0.1641
30 to 35	599	32.5	29	10.1	68.6	70	50	25.4	50%	65	51.3	17.8	65	80	24.5	10376.44	0.103764	$ 0.16	$0.1630
25 to 30	318	27.5	24	8.0	59.0	70	50	25.4	50%	65	48.8	17.0	65	80	24.5	8910.313	0.089103	$ 0.11	$0.1085
20 to 25	193	22.5	18	6.8	62.7	68	50	24.3	50%	65	45.3	16.5	65	80	24.5	5145.863	0.051459	$ 0.08	$0.0808
15 to 20	102	17.5	14	5.1	62.0	68	50	24.3	50%	65	42.8	14.7	65	80	24.3	3062.875	0.030638	$ 0.05	$0.0481
10 to 15	37	12.5	10	3.6	55.4	68	50	24.3	50%	65	40.3	14.1	65	80	24.3	1236.363	0.012363	$ 0.02	$0.0194
5 to 10	13	7.5	5	2.3	49.7	68	50	24.3	50%	65	37.8	13.3	65	80	24.3	478.2375	0.004782	$ 0.01	$0.0075
0 to 5	4	2.5	1	1.1	56.9	68	50	24.3	50%	65	36.8	12.7	65	80	24.3	160.45	0.001605	$ 0.00	$0.0025
-5 to 0	1	-2.5	-2	0.0	81.5	68	50	24.3	50%	65	32.8	12.3	65	80	24.3	43.5375	0.000435	$ 0.00	$0.0007
																			$0.8232

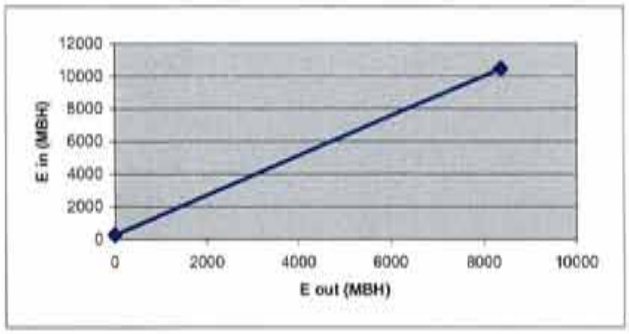
Min Outside Air Damper Position 20%
Heating Efficiency 0.80

HV Unit w/DCV

Temperature Range	BIN Hours (Newark)	OA Dry Bulb Temp (Deg F)	OA Wet Bulb Temp (Deg	OA Enthalpy (btu/lb)	OA RH	Estimated Return Air Temp (Deg F)	Estimated Return Air RH	Return Air Enthalpy (Btu/lb)	OA Damper Position	Mixed Air Setpoint	Mixed Air Temp (Deg F)	Mixed Air Enthalpy (btu/lb)	Estimated Supply Air Temp (Deg F)	Estimated Supply Air RH	Supply Air Enthalpy (Btu/lb)	Heating Load (BTU)	Therms	Heating Cost per cfm	Cost per cfm Summary
95 to 100	0	107.5	62	45.7	34.7	75	50	28.2	20%	82	81.5	31.7	91.5	46.93	31.5	0	0	$ -	$0.0000
90 to 95	4	102.5	60	43.8	38.3	75	50	28.2	20%	81	80.5	31.3	80.5	47.67	31.0	0	0	$ -	$0.0000
85 to 100	30	97.5	76	39.4	38.0	75	50	28.2	20%	80	79.5	30.4	79.5	47.59	30.4	0	0	$ -	$0.0000
90 to 95	95	92.5	75	38.5	45.1	75	50	28.2	20%	79	78.5	30.3	78.5	49.01	30.1	0	0	$ -	$0.0000
85 to 90	242	87.5	72	35.8	47.8	75	50	28.2	20%	78	77.5	29.7	77.5	46.57	29.8	0	0	$ -	$0.0000
80 to 85	404	82.5	70	34.1	54.3	74	50	27.6	20%	76	75.7	28.9	75.7	50.85	28.9	0	0	$ -	$0.0000
75 to 80	657	77.5	68	32.4	62.0	74	50	27.6	20%	75	74.7	28.6	74.7	52.40	28.5	0	0	$ -	$0.0000
70 to 75	840	72.5	65	30.1	67.4	74	50	27.6	20%	74	73.7	28.1	73.7	53.47	28.1	0	0	$ -	$0.0000
65 to 70	767	67.5	61	27.1	69.3	74	50	27.6	20%	73	72.7	27.5	72.7	53.67	27.6	0	0	$ -	$0.0000
60 to 65	709	62.5	58	25.8	68.8	74	50	27.6	20%	72	71.7	26.9	71.7	53.37	26.9	0	0	$ -	$0.0000
55 to 60	724	57.5	51	20.8	63.3	70	50	25.4	20%	69	67.5	24.1	67.5	52.76	24.5	0	0	$ -	$0.0000
50 to 55	760	52.5	47	18.7	67.6	70	50	25.4	20%	67	66.5	24.1	66.5	53.52	24.1	0	0	$ -	$0.0000
45 to 50	763	47.5	42	16.3	69.5	70	50	25.4	20%	66	65.8	23.8	65.8	52.66	23.4	0	0	$ -	$0.0000
40 to 45	594	42.5	38	14.4	68.5	70	50	25.4	20%	65	64.5	23.2	65	60	24.2	527.3	0.0053	$ 0.01	$0.0084
35 to 40	689	37.5	33	12.7	70.1	70	50	25.4	20%	65	63.5	22.7	65	60	24.3	1382.2	0.0138	$ 0.02	$0.0219
30 to 35	599	32.5	29	10.1	68.6	70	50	25.4	20%	65	62.5	22.3	65	60	24.3	1886.623	0.0189	$ 0.03	$0.0298
25 to 30	318	27.5	24	8.0	59.0	70	50	25.4	20%	65	61.5	22.0	65	60	24.3	1488.375	0.0149	$ 0.02	$0.0234
20 to 25	193	22.5	18	6.8	62.7	68	50	24.3	20%	65	59.8	20.8	65	60	24.3	1589.355	0.0159	$ 0.02	$0.0250
15 to 20	102	17.5	14	5.1	62.0	68	50	24.3	20%	65	57.8	20.5	65	60	24.3	977.87	0.0098	$ 0.02	$0.0154
10 to 15	37	12.5	10	3.6	55.4	68	50	24.3	20%	65	56.8	20.2	65	60	24.3	404.565	0.0040	$ 0.01	$0.0064
5 to 10	13	7.5	5	2.3	49.7	68	50	24.3	20%	65	55.8	19.9	65	60	24.3	160.705	0.0016	$ 0.00	$0.0025
0 to 5	4	2.5	1	1.1	56.9	68	50	24.3	20%	65	54.8	19.7	65	60	24.3	0	0.0000	$ -	$0.0000
-5 to 0	1	-2.5	-2	0.0	81.5	68	50	24.3	20%	65	53.9	19.4	65	60	24.3	14.985	0.0001	$ 0.00	$0.0002
																			$0.1527

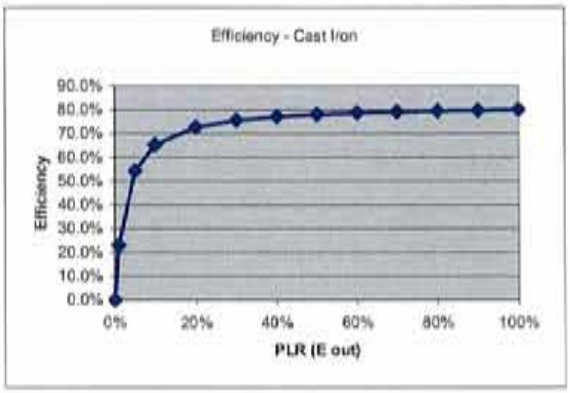
Single Boiler:

	Gas Fuel	
Eff 100%	80.0%	
E in 100%	10460	MBH
E out 100%	8368	MBH
SBL (% Ein)	2.5%	
SBL	261.5	MBH
Min E out	20%	2092
Comb, Eff	83%	
m slope=	1.21875	



INDIVIDUAL BOILER

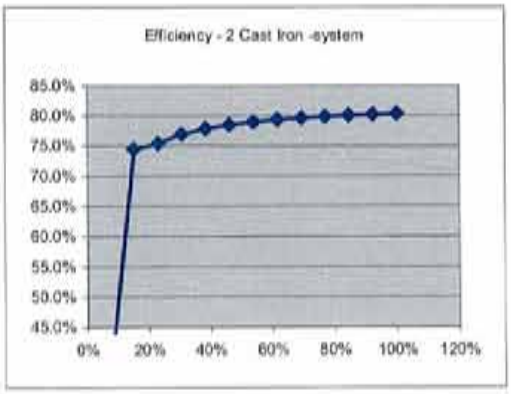
Eout (Load)	PLR	E in	linear relation Efficiency
0	0%	261.5	0.0%
83.68	1%	363.485	23.0%
418.4	5%	771.425	54.2%
836.8	10%	1281.35	65.3%
1673.6	20%	2301.2	72.7%
2510.4	30%	3321.05	75.6%
3347.2	40%	4340.9	77.1%
4184	50%	5360.75	78.0%
5020.8	60%	6380.6	78.7%
5857.6	70%	7400.45	79.2%
6694.4	80%	8420.3	79.5%
7531.2	90%	9440.15	79.8%
8368	100%	10460	80.0%



COMBINED SYSTEM BOILER PART LOAD

Capacity of each	10460
No. of Boilers	1
Total Capacity	10460

Load	PLR	No. of Boilers	Load per boiler	per boiler E in	plant E in	Efficiency	Gas Therm	Oil Gal
10460	100%	1	10460	13010	13010	80.4%	5,111	-
9655	92%	1	9655	12029	12029	80.3%	8,764	-
8851	85%	1	8851	11048	11048	80.1%	15,231	-
8046	77%	1	8046	10068	10068	79.9%	22,652	-
7242	69%	1	7242	9087	9087	79.7%	36,284	-
6437	62%	1	6437	8107	8107	79.4%	39,838	-
5632	54%	1	5632	7126	7126	79.0%	40,516	-
4828	46%	1	4828	6145	6145	78.6%	33,492	-
4023	38%	1	4023	5165	5165	77.9%	28,037	-
3218	31%	1	3218	4184	4184	76.9%	21,757	-
2414	23%	1	2414	3203	3203	75.4%	16,223	-
2092	15%	1	2092	2811	2811	74.4%	-	-
0	0%	1	0	262	262	0.0%	-	-
							267,903	-



Geothermal Analysis - Lakeland HS

Performed By Dome-Tech Energy Advisors

Facility:	Lakeland Regional High School

Annual HVAC Energy Use

Annual Electric Use, kwh	2,246,000
Electric Cost	$0.17/kWh

Natural Gas Use, therms	110,677
Natural Gas Cost	$1.58/therm

Electric*	%	kWh	Cost
Lighting	17%	381,820	
HVAC	53%	1,190,380	$199,102
Office Equipment	20%	449,200	
Miscellaneous	10%	224,600	

*Distribution as per EPA typical office building (http://www.facilitiesnet.com/energyefficiency/article/Managers-Need-to-Address-Builder%)

Natural Gas**	%	Therms	Cost
Lighting	0%	0	
HVAC	90%	99,609	$156,993
Office Equipment	0%	0	
Miscellaneous	0%	0	

**HVAC estimate by Dome-Tech

Total HVAC Cost	$356,095

Geothermal Savings

Cooling	Existing	GSHP	
Energy Efficiency Ratio, EER	10.3	14.1	
Cooling Mode, Electric Use, kWh	1,190,380	869,568	
Annual Electric Costs	$199,102	$145,444	

Cooling Savings
$53,659

Heating	Existing	GSHP	
Gas Fired Heating Efficiency	77%	-	
Coefficient of Performance, COP	-	3.3	
Heating Mode, Natural Gas Use, therms	99,609	-	
Annual Heat Load, therms	76,699	-	
Annual Heat Load, kWh	-	2,247,924	
Heating Mode, Electric Use, kWh	-	681,189	
Annual Energy Costs	$156,993	$113,935	

Heating Savings
$43,058

Annual Heating Savings	$53,659
Annual Cooling Savings	$43,058
Total Annual Savings	**$96,716**

Installation Cost Estimate

Total Square Feet	204,337
Air Flow (CFM) Per Square Foot	1
Air Flow (CFM) Per Ton Refrigeration	400
Connected Cooling Load	511

Cost Per Ton	$5,000	*$7,000*	
Gross Installation Cost Estimate	$2,555,000	$3,577,000	
Investment Tax Credit	$0	$0	*(10% if facility pays federal ta*
NJ SSB Equipment Incentives	$189,070	$189,070	*($370 per ton)*
Net Installation Cost Estimate	$2,365,930	$3,387,930	

Return on Investment

Annual Savings	$96,716	
Installation Cost	$2,365,930	$3,387,930
Payback	24	35

Well Field Dimension

System Size, Tons	511
Well Capacity, ft/ton	250

	250 ft wells	*500 ft wells*
Well Spacing, feet on center	15	15
Number of wells	511	256
Dimension Well Field Foot Print, Sq. Ft	125,372	64,905
Dimension Well Field Foot Print, Acres. Ft	2.9	1.5

Solar PV System LAKELAND HS

Performed By Dome-Tech Energy Advisors

Roof Mounted System

	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	
	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
Gross Length, feet	80	70	95	85	90	30	60	75	
Panel Count (calculated)	23.3	20.4	27.7	24.8	26.2	8.7	17.5	21.9	
Panel Count (actual)	23	20	27	24	26	8	17	21	
	E/W	E/W	E/W	E/W	E/W	E/W	E/W	E/W	
Gross Length, feet	32	80	95	65	50	65	230	65	
Panel Count (calculated)	6.3	15.6	18.6	12.7	9.8	12.7	45.0	12.7	
Panel Count (actual)	6	15	18	12	9	12	44	12	
Gross Panel Qty	138	300	486	288	234	96	748	252	
Panel Reduction %	65%	65%	65%	65%	65%	65%	65%	65%	
Net Panel Qty	90	195	316	187	152	62	486	164	1,652
									Total
System Capacity, kw	21	45	73	43	35	14	112	38	380
Choose Closest City	Newark	Newark	Newark	Newark	Newark	Newark	Newark	Newark	
Capacity Factor (kwh/kw)	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,054	
First Year Expected Produ	21,745	47,272	76,580	45,381	36,872	15,127	117,865	39,708	400,551

Photovoltaic Economic Proforma

Performed by Dome-Tech Energy Advisors
Roof Mount: Customer Owned

ASSUMPTIONS

Capacity:	
Nameplate rating (kW DC)	380.03
Capacity Factor (kWh AC/kW DC)	1.054
First Year Expected Production (kWh)	400,551
Annual Capacity Adjustment	0.50%
Project Cost Data:	
Cost per kw installed (Gross)	$7,000
Gross Installed Cost	$2,660,203
Total project cost	$2,660,203
Other:	
Federal Tax Rate	0.0%
Discount Rate	8.0%
Inflation rate	2.5%
PA Solar Renewable Energy Credits:	
Solar REC Discount ($/Mwh)	$50
SREC Sales Commission Rate	4.0%
Production Benefit:	
Useful Economic Life	25
Avoided Electric Price Rate Cap ($/kwh	$0.167
Electric Price Escalation Rate	3.00%
Transformer loss savings	3.00%
Operating Expenses:	
Annual Maintenance Cost	$7,601
Federal Tax Incentives:	
Federal Business Energy Tax Credit	0.00%
Deduct FITC from Depreciation Basis?	Y

Financial Returns:	
IRR (25 years)	7.2%
NPV (25 years at 8%)	($140,653)
IRR (15 years)	5.6%
NPV (15 years at 10%)	($325,584)
Actual Payback	9.6

LIFE CYCLE COST ANALYSIS

YEAR			TAX BENEFIT				OPERATIONS SUMMARY / ASSUMPTIONS			CASH FLOW SUMMARY									
Year	Date	AOP	Depreciation – Accelerated (MACRS)	Depreciation Tax Benefit	Federal Business Energy Tax Credit	Total Tax Benefit	Plant capacity factor	Energy production (kWh)	Avoided Electricity Cost ($/kWh)	Investment	Tax Benefit	Avoided electric cost	Avoided Xlinx loss savings	REC value ($)	REC Commission ($)	Annual O&M	REC Income Tax ($)	Total Cash Flow	Cumulative Cash Flow
0	2009	$711/MWH	0.00%	$0		$0			$0.167	($2,660,203)	$0							($2,660,203)	($2,660,203)
1	2010	$690/MWH	20.00%	$0	$0	$0	100.0%	400,551	$0.167		$0	$66,893	$2,007	$266,220	($10,240)	($7,601)	$0	$307,269	($2,352,934)
2	2011	$669/MWH	32.00%	$0		$0	99.5%	398,549	$0.167		$0	$66,557	$1,997	$240,693	($9,259)	($7,791)	$0	$297,589	($2,055,345)
3	2012	$649/MWH	19.20%	$0		$0	99.0%	396,555	$0.172		$0	$68,211	$2,046	$237,901	($9,150)	($7,985)	$0	$290,273	($1,765,071)
4	2013	$629/MWH	11.50%	$0		$0	98.5%	394,572	$0.177		$0	$69,906	$2,097	$236,632	($9,101)	($8,185)	$0	$293,304	($1,471,768)
5	2014	$611/MWH	11.50%	$0		$0	98.0%	392,599	$0.182		$0	$71,644	$2,149	$235,075	($9,041)	($8,390)	$0	$291,836	($1,179,932)
6	2015	$592/MWH	5.80%	$0		$0	97.5%	390,636	$0.188		$0	$73,424	$2,203	$211,820	($8,147)	($8,600)	$0	$270,376	($934,715)
7	2016	$574/MWH					97.0%	388,683	$0.194			$75,249	$2,257	$203,855	($8,154)	($8,814)	$0	$264,392	($670,323)
8	2017	$557/MWH					96.6%	386,740	$0.199			$77,119	$2,314	$198,171	($7,647)	($9,035)	$0	$258,721	($411,602)
9	2018	$541/MWH					96.1%	384,806	$0.205			$79,035	$2,371	$188,757	($7,550)	($9,261)	$0	$253,352	($158,250)
10	2019	$524/MWH					95.6%	382,882	$0.212			$80,996	$2,430	$181,884	($7,274)	($9,492)	$0	$248,277	$90,027
11	2020	$509/MWH					95.1%	380,968	$0.218			$83,012	$2,490	$174,764	($6,990)	($9,729)	$0	$243,469	$333,516
12	2021	$493/MWH					94.6%	379,063	$0.224			$85,075	$2,552	$168,047	($6,722)	($9,973)	$0	$238,879	$572,495
13	2022	$478/MWH					94.2%	377,168	$0.231			$87,189	$2,616	$161,625	($6,465)	($10,223)	$0	$234,742	$807,237
14	2023	$464/MWH					93.7%	375,282	$0.238			$89,355	$2,681	$155,479	($6,219)	($10,477)	$0	$230,771	$1,038,008
15	2024	$450/MWH					93.2%	373,405	$0.245			$91,576	$2,747	$149,452	($5,978)	($10,739)	$0	$227,058	$1,265,065
16	2025						92.8%	371,538	$0.253			$93,851	$2,816			($11,008)		$85,659	$1,350,725
17	2026						92.3%	369,681	$0.260			$96,184	$2,886			($11,283)		$87,788	$1,438,511
18	2027						91.8%	367,832	$0.268			$98,574	$2,957			($11,565)		$89,966	$1,528,477
19	2028						91.4%	365,993	$0.276			$101,023	$3,031			($11,854)		$92,200	$1,620,678
20	2029						90.9%	364,163	$0.284			$103,534	$3,106			($12,151)		$94,489	$1,715,168
21	2030						90.5%	362,342	$0.293			$106,107	$3,183			($12,454)		$96,835	$1,812,001
22	2031						90.0%	360,531	$0.302			$108,745	$3,262			($12,766)		$99,240	$1,911,241
23	2032						89.6%	358,728	$0.311			$111,449	$3,343			($13,085)		$101,704	$2,012,945
24	2033						89.1%	356,934	$0.320			$114,215	$3,426			($13,413)		$104,230	$2,117,175
25	2034						88.7%	355,150	$0.330			$117,093	$3,512			($13,747)		$106,818	$2,223,992
	15 Yr Total					$0		5,802,456			$0	########	$54,057	########	########	########	$0	$5,925,208	
	25 Yr Total					$0		8,435,309			$0	########	$80,679	########	########	########	$0	$4,584,195	

Wind Analysis - LAKELAND HS

Performed By Dome-Tech Energy Advisors

Average Wind Speed	4.3	4.3	6.4
Annual Electric Use, kwh	2,246,000	2,246,000	2,246,000
Electric Cost	$0.17/kWh	$0.17/kWh	$0.17/kWh

Name	Lakeland Regional High School
Annual Electric Use, kwh	2,246,000
Electric Cost, kwh	$0.107

	Micro	Traditional 5.2 kw	Traditional 50 kw
Number of Units	20	2	1
kW Capacity, per Unit	1 Kw	5.2 Kw	50.0 Kw
kW Capacity, Total	20 Kw	10 Kw	50 Kw
Annual Production Per Unit	619 Kwh	4,978 Kwh	89,827 Kwh
Annual Production Total	12,388 Kwh	9,956 Kwh	89,827 Kwh
Annual Savings	$2,072	$1,665	$15,025
Installed Cost per Unit	$6,500		
Installed Cost per Kw		$6,000	$5,000
Gross Installed Cost	$130,000	$62,400	$250,000
NJ Incentive	$39,643	$31,858	$88,114
Net Installed Cost	$90,357	$30,542	$161,886
Simple PayBack	43.6	18.3	10.8
% Energy Use	0.6%	0.4%	4.0%

Monthly Averaged Wind Speed At 10 m Above The Surface Of The Earth For Terrain Similar To Airports (m/s)

Latitude	Longitude	January	February	March	April	May	June	July	August	September	October	November	December	avg
41.05	-74.23	4.60	4.60	4.50	4.70	4.10	3.80	3.60	3.40	3.00	3.50	4.00	4.30	4.25

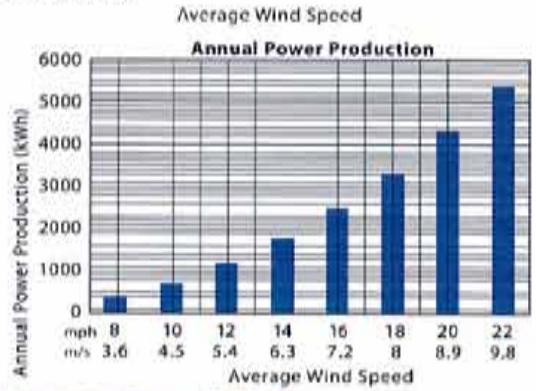
Monthly Averaged Wind Speed At 50 m Above The Surface Of The Earth (m/s)

Latitude	Longitude	January	February	March	April	May	June	July	August	September	October	November	December	avg
41.05	-74.23	6.00	6.11	6.20	6.08	5.27	4.85	4.40	4.20	4.09	4.50	5.70	5.64	5.30

Latitude 40 34 N
Longitude 74 27 W
NASA Surface meteorology and Solar Energy: Data Subset
http://eosweb.larc.nasa.gov/cgi-bin/sse/subset.cgi?email=
UN k_mccarthy@dome-tech.com
PW dometech

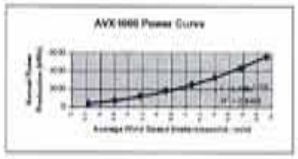
http://www.awea.org/smallwind/toolbox/TOOLS/ls_safety.asp

AVX1000 Power Curve



m/s	annual kwh
3.6	390
4.5	710
5.4	1200
6.3	1800
7.2	2500
8	3300
8.9	4300
9.8	5550

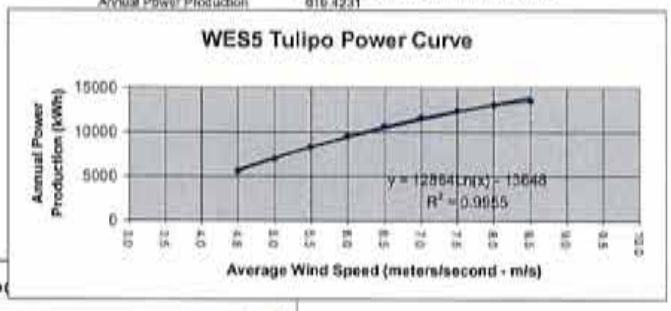
y = 13.436x^2.6458
R2 = 0.9995



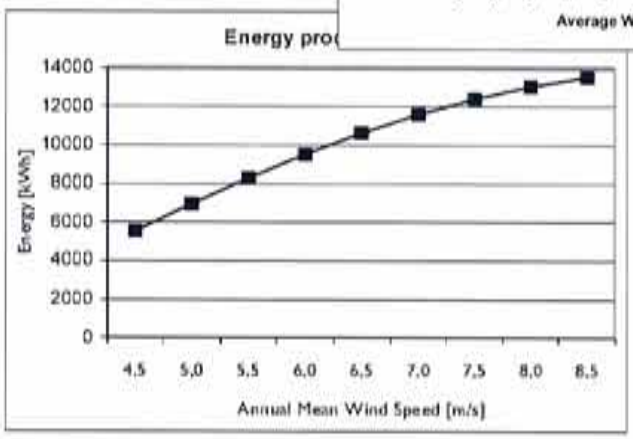
Average Wind Speed 4.3 * Has to be greater than 2.2 m/s
Annual Power Production 910.4231

http://www.prevailingwindpower.com/1000AVX.pdf

WES5 Tulipo



Wind speed [m/s]	Energy [kWh]
4,5	5541
5,0	6947
5,5	8294
6,0	9534
6,5	10638
7,0	11593
7,5	12391
8,0	13036
8,5	13534



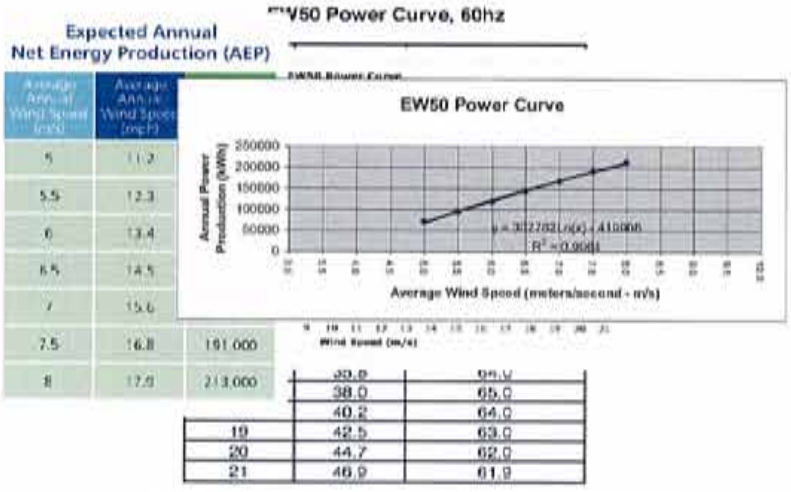
m/s	annual kwh
4.5	5541
5.0	6947
5.5	8294
6.0	9534
6.5	10638
7.0	11593
7.5	12391
8.0	13036
8.5	13534

y = 12864Ln(x) - 13648
R2 = 0.9955

Average Wind Speed #
Annual Power Production #

http://www.windenergysolutions.nl/fileadmin/user_upload/Technical_Specifications_WES5_Tulipo.pdf

EW50



5	11.2	
5.5	12.3	
6	13.4	
6.5	14.5	
7	15.6	
7.5	16.8	161,000
8	17.9	213,000

	38.0	65.0
	40.2	64.0
19	42.5	63.0
20	44.7	62.0
21	46.9	61.9

m/s	annual kwh
5.0	72000
5.5	95000
6.0	119000
6.5	144000
7.0	169000
7.5	191000
8.0	213000

y = 30270.2Ln(x) - 419008
R2 = 0.9984

Average Wind Speed #
Annual Power Production #

http://www.entegrity-wind.com/pdfs/EW50-Specs.pdf