Energy Savings Plan

Presented to:

Robbinsville Public School District

Submitted To:
Mr. Robert DeVita
Robbinsville Public School District
155 Robbinsville Edinburg Road
Robbinsville, NJ 08691

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EXECUTIVE SUMMARY

Honeywell is pleased to have the opportunity to submit this Energy Savings Plan for the Robbinsville Public School District. During the development of the Energy Savings Plan, Honeywell has completed a thorough investment grade energy audit of the Robbinsville Public School District's buildings and grounds. Based on the audit findings and Honeywell's extensive experience in working with school districts, we are able to confidently state that we can deliver a financially viable, comprehensive solution to address the District's facility concerns. Our Energy Savings Plan includes projects that achieve energy and operational efficiencies, create a more comfortable and reliable learning environment and are actionable via the New Jersey Energy Savings Improvement Program (NJ ESIP) in accordance with NJ PL2009, c.4.

The Energy Savings Plan is the core of the NJ ESIP process. It describes the energy conservation measures that are planned and the cost calculations that support how the plan will pay for itself through the resulting energy savings. Under the law, the Energy Savings Plan must address the following elements:

1. The results of the energy audit;
2. A description of the energy conservation measures (ECMs) that will comprise the program;
3. An estimate of greenhouse gas reductions resulting from those energy savings;
4. Identification of all design and compliance issues and identification of who will provide these services;
5. An assessment of risks involved in the successful implementation of the plan;
6. Identify the eligibility for, and costs and revenues associated with, the PJM Independent System Operator for demand response and curtailable service activities;
7. Schedules showing calculations of all costs of implementing the proposed energy conservation measures and the projected energy savings;
8. Maintenance requirements necessary to ensure continued energy savings, and describe how they will be provided; and
9. If developed by an ESCO, a description of, and cost estimates of a proposed energy savings guarantee.

The purpose of this document is to provide all the information required for the Robbinsville Public School District to determine the best path forward in the implementation of a District-Wide NJ ESIP Project. It is important to note that the Energy Savings Plan provides a comprehensive evaluation of ALL potential ECMs within the Robbinsville Public School District. This is not meant to imply that all of the ECMs identified must be, or based upon legislative requirements, can be implemented at this time. However, as long as the ECM is part of this plan, it may be implemented at a later date as additional funding becomes available or technology changes in order to provide an improved financial return.

The next step in the NJ ESIP process is for the School District to review the information presented in this Energy Savings Plan, and in conjunction with District priorities, select the ECMs which merit further development. The selections may include any combination of ECMs as long as the resulting overall project pays for itself in accordance with NJ PL2009, c.4. In consideration of these selections, a specific agreement shall then be developed authorizing Honeywell to proceed with an implementation program which meets the requirements of the NJ ESIP law and the District's Request for Proposal (RFP).

Our Energy Savings Plan is structured to clearly demonstrate compliance with the NJ ESIP law, while also presenting the information in an organized manner which allows for informed decisions to be made. The information is divided into the following sections:

A. Independent Energy Audit / Preliminary Utility Analysis – This section includes, for reference, the independent energy audits as previously received by the Board. The audits provided by Spiezle Architectural Group have been provided on a compact disk marked as Appendix I. A comparison can be made of the ECMs outlined in this audit to the additional ECMs described in the overall Energy Savings Plan.

This section also includes a baseline Preliminary Utility Analysis (PUA) for the four school buildings included in the Energy Savings Plan. It provides an overview of the current usage within the District and a cost per square foot by school of utility expenses. Further, the report clearly defines the current utility expenses for the School District and compares it to the costs of other similar school districts in the region through an energy efficiency benchmarking metric referred to as Energy Use Intensity (EUI). The Robbinsville Schools were found to have Energy Use Intensity (EUIs) ranging from 101 to 189. This indicates that there is potential for improvement within the buildings.

B. Identified Energy Conservation Measures – This section includes a more detailed description of the ECMs we have selected and identified for your District. It is specific for your Schools in scope, savings methodology and environmental impact. It is intended to provide an overview of the projects and not a detailed specification for construction. It identifies ALL potential ECMs for the District for the purposes of inclusion in the program. Final selected ECMs are to be determined by the School District in conjunction with Honeywell during the project development phase of the NJ ESIP process.

C. Financial Analysis – This section includes a detailed accounting of all ECM financials in accordance with NJ PL2009, c.4, including projected implementation costs, projected energy savings, operational savings and, if applicable, capital cost avoidance. This information is presented in two formats. The first is a line-by-line ECM Summary format, which identifies the financial impact of each individual energy conservation measure (ECM) and the overall project in terms of simple payback without financing costs. The second is the Cash Flow format, which has been prepared for Sample Project No.1 and Sample Project No.2. The Cash Flow provides a "rolled-up" view of the overall project financials, inclusive of financing costs, on an annual basis as well as over the entire 15 year term of the agreement.

The following ECM Summaries have been provided for the District's review and consideration:

1. Building by Building ECM Summary
2. District-Wide ALL ECM Summary
3. Sample Project No.1 (No Capital Cost Avoidance)
4. Sample Project No.2 (Pond Road MS Roof Replacement with Capital Cost Avoidance)

Ultimately, during the project development phase Honeywell will provide our recommendations and the School District will select the content of the projects based upon the District's goals and objectives. The selections will also consider the available financing options at the time of the agreement. Interest rates, length of term and other factors will all play a part in the final selection and cash flow of ECMs. The definitive requirement under NJ PL2009, c.4 is that the project is self funding within the 15 year term as outlined in the legislation.

The following Cash Flows have been provided for the District's review and consideration:

1. **Sample Project No.1 Cash Flow** – This document presents the annual cash flow associated with the implementation of Sample Project No.1 over the entire 15 year term. Sample Project No.1 includes no capital cost avoidance and thus will not add additional burden on your tax payers. It can be funded completely through energy and operational savings. When structured financially to match the savings identified, the School District will not incur any out of pocket costs and pay for all upgrades from money that is already being spent elsewhere in the district. Over the term of the agreement, the School District will be in a positive cash flow situation.
2. **Sample Project No.2 Cash Flow** – This document presents the annual cash flow associated with the implementation of Sample Project No.2 over the entire 15 year term. Sample Project No.2 includes replacement of the Pond Road Middle School Roof (ECM 4B). This scenario includes $38,442 in annual capital cost avoidance, which is necessary to offset the roof replacement cost. The overall project would, however, be 89% funded through energy and operational savings alone. The remaining 11% would be an annual capital cost identified as funds that the District would have needed to spend in the replacement of the roof regardless of the NJ ESIP Project.

Overall, the School District is well positioned to implement a program that can pay for itself within the requirements of the law while upgrading your facilities with zero or minimal impact on your taxpayer base.

D. **Energy Calculations and Greenhouse Gas Reduction Summary –** This section includes all the energy calculations required to ensure compliance with the law and to confirm the energy savings can and will be achieved. These calculations are in fact subject to an independent 3rd party engineering firm review for verification.

A summary of all savings based on all projects include a **reduction in 2,915,414kWh** (kilowatt hours of electricity), **74,953 Therms** and **2164.11 Tons of Greenhouse Gas (GHG) emissions**. It is the equivalent of removing **378 cars** from the road for an entire year and is the same as planting **227.8 acres of forest**.

E. **M&V/Preventive Maintenance Summary –** This section includes all available methods of verification and measurement for calculating energy savings. These methods are compliant with the International Measurement and Verification Protocols (IMVP), as well as other protocols previously approved by the Board of Public Utilities (BPU) in New Jersey. This section also includes the recommended maintenance requirements for each type of equipment that may be included in this program. Consistent maintenance is essential to achieving the energy savings projected in this plan.

F. **Design Approach –** This section includes a summary of Honeywell's best practices for the successful implementation of a NJ ESIP project. It provides an overview of our project management procedure, construction management and a sample time frame for the overall completion of the project. Within the sample schedule, we clearly define the stage designated for compliance with architectural, engineering and bidding procedures in accordance with New Jersey Public Contracts Law.

We welcome this opportunity to partner with the Robbinsville Public School District in order to improve the efficiency of your facilities through the successful implementation of this Energy Savings Plan.

Sincerely,

Sean T. Yates
Account Executive
Honeywell International

SECTION A: Utility Analysis/Independent Audits

- **Honeywell Utility Analysis**
  Honeywell has included our Preliminary Utility Analysis on the following page of this section.

- **Independent Audits (Disc)**
  Honeywell has included an Independent Energy Audit by Spiezle Architectural Group on a Disc in the Appendix Section of our Energy Savings Plan

SECTION A: Utility Analysis/Independent Audits

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Honeywell

Honeywell Energy Analysis Team (HEAT)

Preliminary Utility Analysis

Robbinsville Public School District
Robbinsville, NJ

Helping customers manage energy resources to improve

Executive Summary

Honeywell would like to thank you for the opportunity of providing you with this Preliminary Utility Analysis. A detailed billing analysis was completed for all utility data provided by you. The facility's electric, natural gas, and fuel oil consumption were compared to a benchmark of typical facilities of similar use and location.

Through our Energy Services offerings, Honeywell's goal is to form a long term partnership for the purpose of meeting your current infrastructure needs by focusing to:

- Improve Operational Cost Structures
- Ensure Satisfaction
- Upgrade Infrastructure While Reducing Costs
- Meet Strategic Initiatives
- Leverage Teamwork
- Pursue Mutual Interests
- Provide Financing Options

How does it work?

Under an energy retrofit solution, Honeywell installs new, energy efficient equipment and optimizes your facility, as part of a multi-year service contract. Most of these improvements are cost-justified by energy and operational savings. Some of the energy conservation measures provide for a quick payback, and as such, would help offset other capital intensive energy conservation measures such as, boilers, package rooftop units, domestic hot water heaters, etc. The objective is to provide you with reduced operating costs, increased equipment reliability, optimized equipment use, and improved occupant comfort.

After review of the utility analysis, you can authorize Honeywell to proceed with the development of a detailed engineering report. The report development phase allows Honeywell to prepare an acceptable list of proposed energy conservation measures, which are specific to the selected facility. Some examples of typical Energy Conservation Measures include:

- Lighting
- Energy Efficient Motors
- Control Systems
- Boilers
- Chillers
- Variable Speed Drives
- Steam Systems
- Package Rooftop Units
- Domestic Hot Water Heaters
- Power Factor Correction

Why Honeywell?

- Honeywell is one of the world leaders in providing infrastructure improvements
- With Honeywell as your building partner, you gain the advantage of more than 115 years of leadership in building services
- Honeywell has the infrastructure and manpower in place to manage and successfully implement your project
- Honeywell has over 30 years experience in the energy retrofit marketplace with over $3 Billion in customer energy savings
- Honeywell provides you with "Single Source Responsibility" - from Engineering to Implementation, Servicing and Financing (if desired)

Energy Benchmarking - Schools

The calculation of EUI (Energy Use Intensity) is shown below. EUI, expressed in kBtu/sf, is normalized for floor area, the most dominant influence on energy use in most buildings. Its use usually provides a good approximation of how your building's energy performance compares to others. Site EUI indicates the rate at which energy is used at your building (the point of use). Source EUI indicates the rate at which energy is used at the generation sources serving your building (the point of source) and indicates the societal energy penalty due to your building The lower the EUI, the higher the rating, indicating that the building is more efficient than other buildings. The greater the EUI, the lower the rating, indicating that there is an opportunity for higher potential benefits from operational improvements.

To compare the buildings shown below to each other, and to determine the ranking of the buildings from having the most to the least opportunity for demand-side improvements from a financial perspective, please see the Site EUI ranking below.

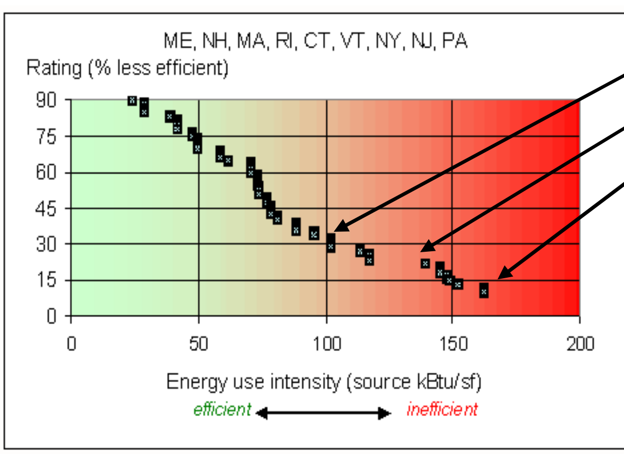
The Source EUI below has been applied to a Department of Energy statistical model from the Oak Ridge National Laboratory web site, http://eber.ed.ornl.gov/benchmark. The Department of Energy has estimated energy use and cost reductions for building source EUI ratings (percentiles) in the table below. Please see the DOE Regional Source EUI Comparison graph below to rate your building in relation to the regional distribution of similar type buildings. (Note: The Source EUI includes the inefficiencies of electrical generation and transmission. A reduction in 'electrical' source EUI includes a benefit in terms of reduction of air pollution emissions and green house gases, and is thus an indicator of societal benefit.)

Source EUI Rating for your Building	Energy use and cost reduction potential (%)	Walk-thru energy assessment recommended?
above 60%	below 25%	No
40 to 60%	20 to 35%	Maybe
20 to 40%	35 to 50%	Yes
Below 20%	above 50%	Definitely

Rating from the most efficient to the least efficient - 2011 consumption

Site EUI Rank	Building	Annual Total Electrical Use (kWh)	Annual Total Natural Gas Use (Therms)	Annual Total Fuel Use (Gals)	Building Gross Floor Area (sq-ft)	Source EUI: Annual Total Source Energy Use per Sq-Ft (kBtu/sf)	Site EUI Rating	Rating (Regional Source EUI Comparison)
1	Windsor ES	22,780	0	2,582	5,897	101	60	40%
2	Pond MS	1,505,300	49,094	-	150,000	138	80	30%
3	Sharon ES	816,259	23,842	-	78,800	139	77	30%
4	Robbinsville HS	2,578,800	143,285	-	221,457	189	130	10%

Educational Facilities (K-12 Schools)

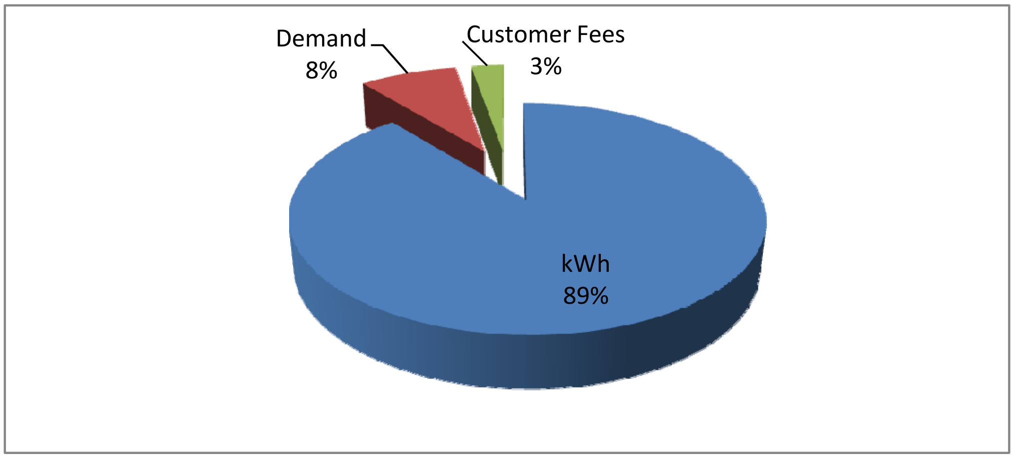


Source EUI	Est Regional Rating	Building
101	40%	Windsor ES
138	30%	Pond MS
139	30%	Sharon ES
189	10%	Robbinsville HS

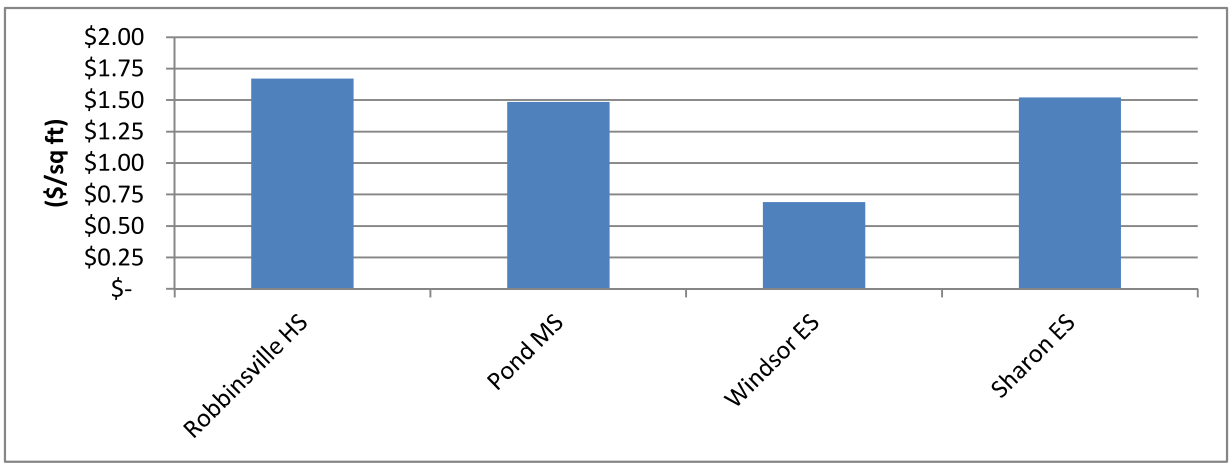
Source: Oak Ridge National Laboratory web site, http://eber.ed.ornl.gov/benchmark

Electric Utility Analysis - Schools

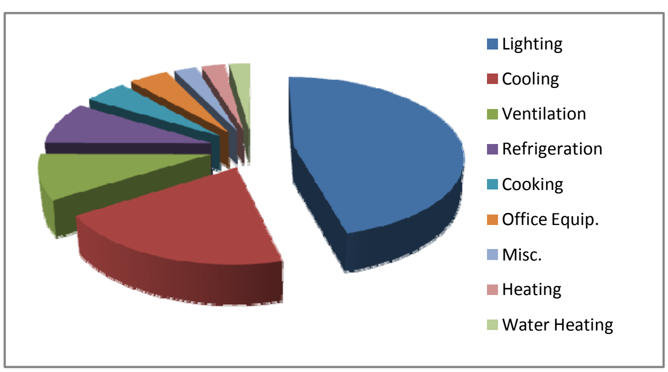
Components of Your 2011 Electric Cost



Square Footage Analysis



Sources of Electric Consumption



Typical Allocation Applied to Your Electric Cost**

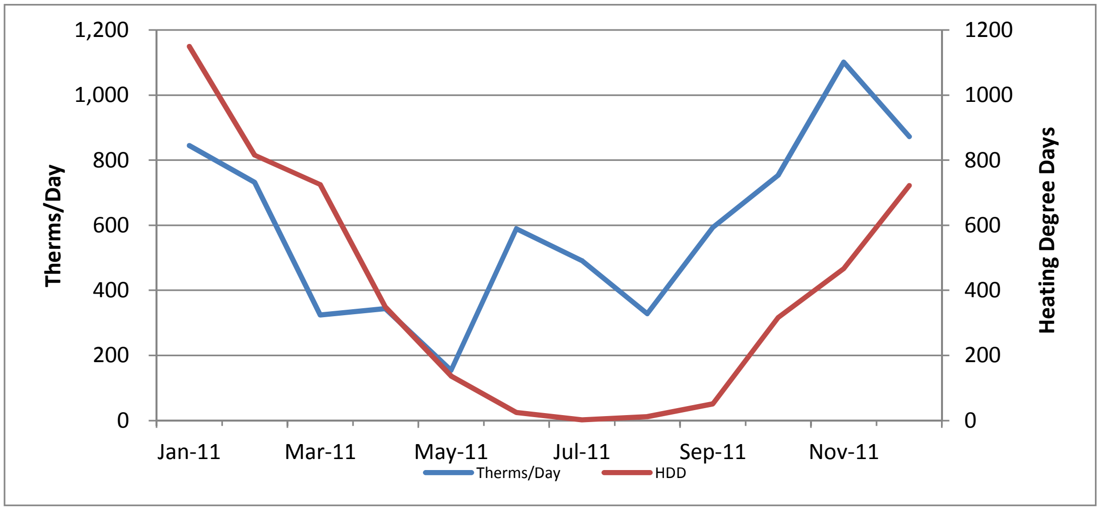
Lighting	$329,843
Cooling	$143,410
Ventilation	$64,534
Refrigeration	$61,666
Cooking	$33,701
Office Equip.	$31,550
Misc.	$17,926
Heating	$17,926
Water Heating	$15,775
Your '10/'11 Total Cost	**$717,050**

**This allocation is generic and is not a representation of the actual end use in your buildings included in this report.

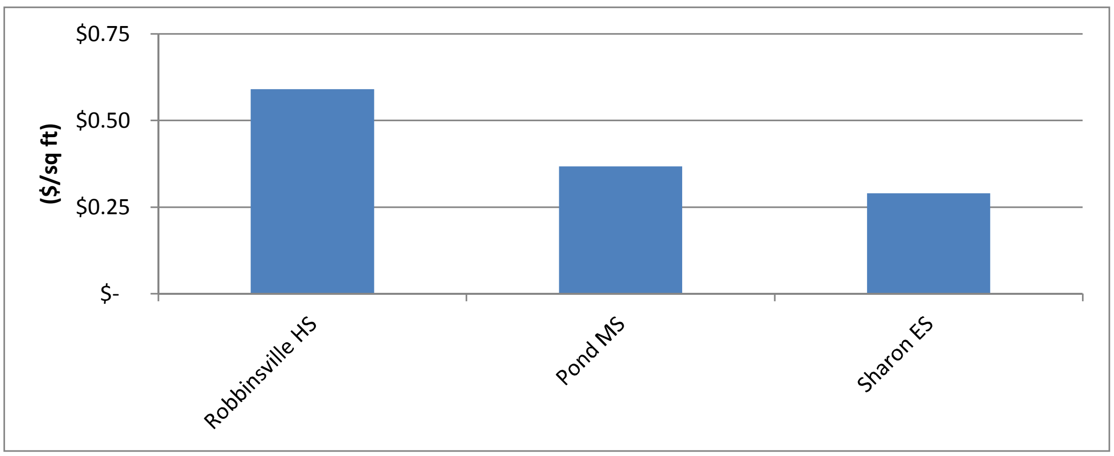
*Source: EIA energy intensity dta from CBECS and MECS, EPRI, and other third party energy use data sets

Utility Analysis - Natural Gas

Natural Gas Usage and Heating Degree Days for All Accounts

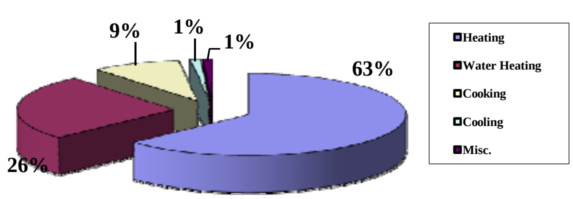


Square Footage Analysis



Sources of Natural Gas Usage

Typical End Use Allocation *



Typical Allocation Applied to Your Gas Cost**

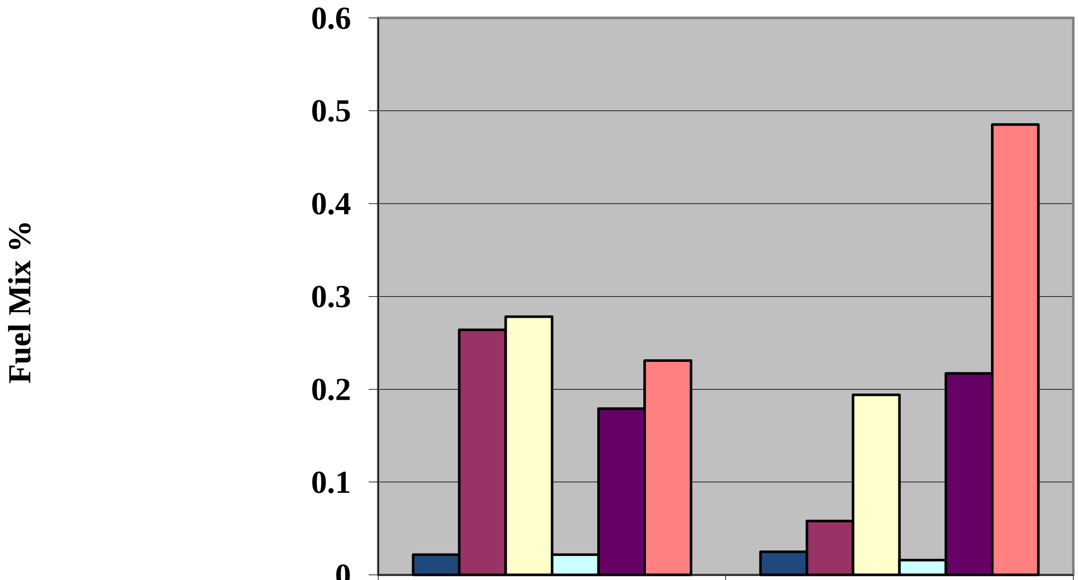
Heating	$121,690
Water Heating	$60,323
Cooking	$23,795
Cooling	$2,296
Misc.	$626
2011 Total Cost	**$208,731**

**This allocation is generic and is not a representation of the actual end use in your buildings included in this report.

*Source: Nashville Gas Commercial Benchmark Data by Business Segment and Climate Zone

Fuel Mix Comparison

This chart compares fuel mix (%) of sources used to generate electricity in your region to the fuel mix (%) for the entire United States.



	Your Region*	National Avg
Non Hydro Renewables	0.022	0.025
Hydro	0.264	0.058
Nuclear	0.278	0.194
Oil	0.022	0.016
Gas	0.179	0.217
Coal	0.231	0.485

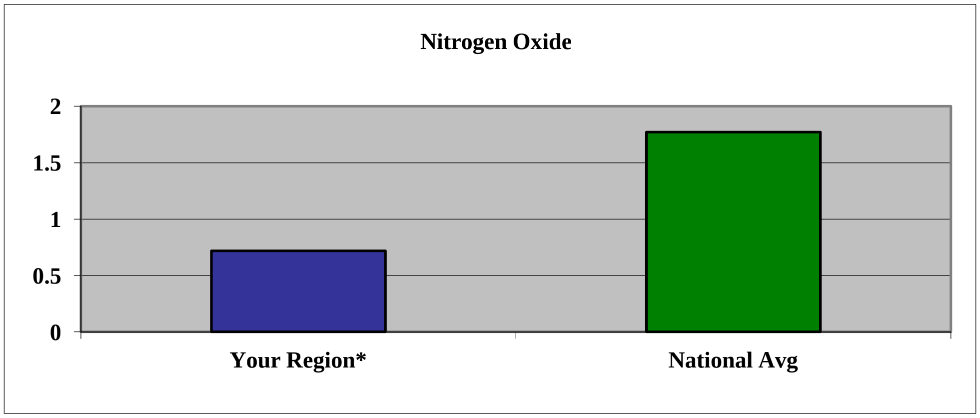
* eGRID Subregion: RFC East (which includes the ZIP code 08691)

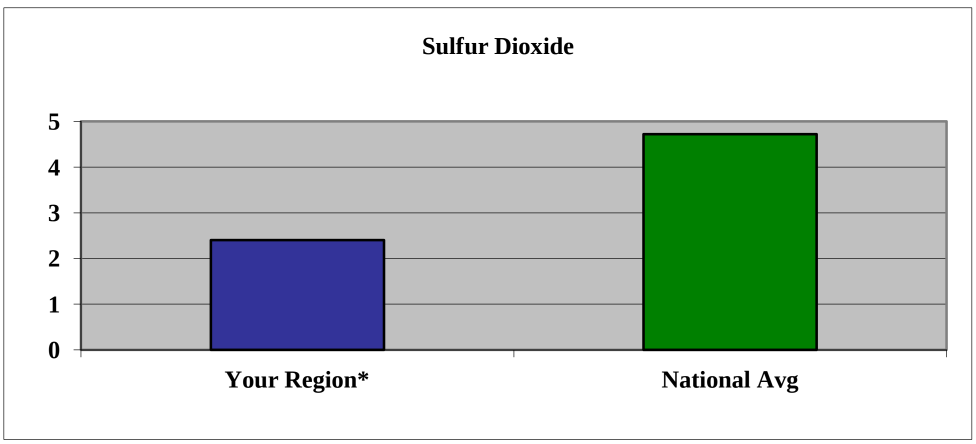
NOTE: The information reported above is derived from EPA's eGRID database for calendar year 2005.

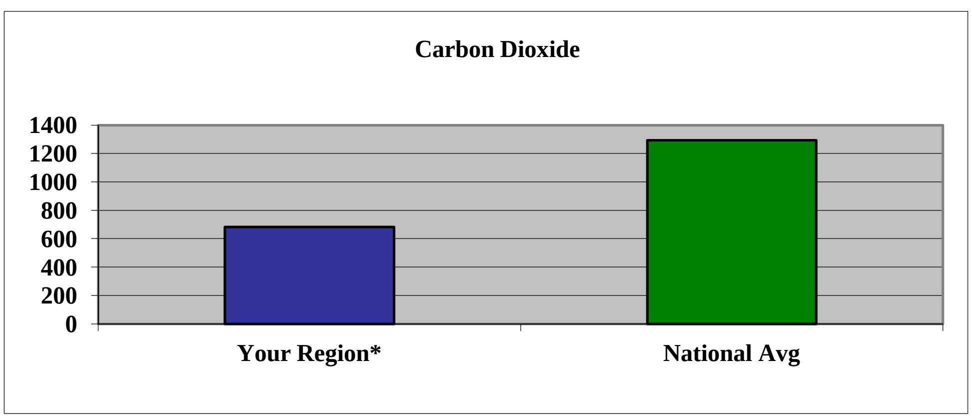
Emissions Rate Comparisons - Electric

Emissions Rate Comparison

This chart compares the average emissions rates (lbs/MWh) in your geographical region to the national average emissions rates (lbs/MWh) for nitrogen oxide, sulfur dioxide, and carbon dioxide.







* eGRID Subregion: RFC East (which includes the ZIP code 08691)

NOTE: The information reported above is derived from EPA's eGRID database for calendar year 2005.

Annual Emissions & Environmental Impact

Robbinsville Public School District

Annual Period: 01/01/2011 - 12/31/2011

Zip Code 08691

The following energy usage and pollution have been quantified:

Total Annual Electric usage	4,923,139	kWh
Annual Natural Gas usage	216,221	Therms

Annual Greenhouse Gas Emissions		
CO2	12,959,322	pounds
SO2	206,122	pounds
NOx	39,299	pounds

CO_2	**Carbon Dioxide -** Is a naturally occuring gas and is a by-product of buring fossil fuels and biomass as well as land-use changes and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the earth's radiative balance.
SO_2	**Sulfur Dioxide -** Is released primarily from burning fuels that contain sulfur (such as coal, oil, and diesel fuel). High concentrations of sulfur dioxide affect breathing and may aggravate existing respiratory and cardiovascular disease.
NO_x	**Nitrogen Oxides -** Gases consisting of one molecule of nitrogen and varying numbers of oxygen molecules. Nitrogen oxides are produced in the emissions of vehicle exhausts and from power stations. In the atmosphere, nitrogen oxides can contribute to formati

Environmental Impact

The Annual Greenhouse Gas Emissions quantified is equivalent to one of the following:

1,153	Number of passenger cars' annual greenhouse gas emissions
658,997	Gallons of gasoline consumed
13,670	Barrels of oil consumed
510	Home energy use for one year
150,724	Carbon sequestered by number of tree seedlings grown for 10 years
1,253	Carbon sequestered annually by acres of pine or fir forests
58	Carbon sequestered annually by acres of forest preserved from deforestation
244,927	Propane cylinders used for home barbeques
32	Burning railcars' worth of coal
2,048	Greenhouse gas emissions avoided by recycling tons of waste instead of sending it to the landfill

Based on the US Environmental Protection Agency - Clean Energy Power Profiler

Robbinsville Public School District - Utility Baseline (Jan 2011 - Dec 2011)

	Electric				Natural Gas	Adjusted	Adjusted	# 2 Fuel Oil			Fuel - Combined (Ngas & Oil)			Adjusted	Water			Total $	Total	$
Building	**Total KW**	**Ann. kWh**	**$**	**$/kWh**	**Therm**	**$**	**$/Therm**	**Gallons**	**Billed $**	**$/Gal**	**$/Therms**	**Therms**	**$**	**$/Therms**	**Kgal**	**$**	**$/Kgal**	**All Utilities**	**Square Feet**	**Per SF**
Robbinsville HS	5,658.0	2,578,800	$370,228	$0.1436	143,285	$130,815	$0.9130					143,285	$130,815	$0.9130	1,800	$8,532	$4.7400	$509,575	221,457	$2.30
Pond MS	4,886.0	1,505,300	$222,918	$0.1481	49,094	$55,050	$1.1213					49,094	$55,050	$1.1213	1,012	$4,797	$4.7400	$282,764	150,000	$1.89
Windsor ES	250.0	22,780	$4,073	$0.1788				2,582	$8,170	$3.16	$2.26	3,615	$8,170	$2.2601	35	$166	$4.7400	$12,409	5,897	$2.10
Sharon ES	3,051.0	816,259	119,831	$0.1468	23,842	$22,867	$0.9591					23,842	$22,867	$0.9591	1,056	$5,005	$4.7400	$147,703	78,800	$1.87
	13,845	**4,923,139**	**$717,050**	**$0.1456**	**216,221**	**$208,731**	**$0.9654**	**2,582**	**$8,170**			**219,836**	**$216,901**	**$0.9867**	**3,903**	**$18,500**	**$4.7400**	**$952,451**	**456,154**	**$1.13**

Annual Cost Summ

Utility	**Baseline**
Electric	**$717,050**
Natural Gas	**$216,901**
Water	**$18,500**
Total	**$952,451**

SECTION B: Energy Conservation Measures

Introduction

The information used to develop this Section was obtained through building surveys to collect equipment information, interviews with operators and end users, and an understanding of the components to the systems at the sites. The information obtained includes nameplate data, equipment age, condition, the system's design and actual load, operational practices and schedules, and operations and maintenance history.

Honeywell has done a review of the Energy Conservation Measures (ECM) which would provide energy and cost savings to the Robbinsville Public School District. This report aims to be an assessment of the feasibility and cost effectiveness of such measures, and an indication of the potential for their implementation. The ECMs listed below have been reviewed throughout your facilities for consideration within a complete Energy Savings Plan. What follows is a general description of the energy auditing process and the detailed descriptions of the Energy Conservation Measures for your facilities.

Energy Conservation Measures:

ECM	1A	Lighting Retrofit and Motion Sensors
ECM	1B	De-Stratification Fans
ECM	1C	Vending Misers
ECM	2A	Boiler Replacements
ECM	2B	Domestic Hot Water (DHW) Heater Replacement
ECM	2C	Boiler Burner Controls
ECM	2D	Kitchen Hood Controls
ECM	2E	Walk-In Refrigerator/Freezer Controls
ECM	2F	Solar Thermal Domestic Hot Water
ECM	2G	RTU Cooling
ECM	3A	Building Management System Upgrades
ECM	3B	Demand Control Ventilation
ECM	4A	Building Envelope Improvements
ECM	4B	Roof Replacements
ECM	4C	Window Replacements
ECM	4D	Door Replacements
ECM	5A	Power Factor Optimization
ECM	5B	Transformer Replacement
ECM	5C	Premium Efficiency Motors and VFDs
ECM	6A	Water Conservation
ECM	6B	Steam Trap Replacement
ECM	7A	Computer Monitor Replacements
ECM	7B	Virtual IT Work Stations
ECM	8A	Photovoltaic Array
ECM	9A	Demand Response

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ECM	ECM Description	Robbinsville High School	Pond Road Middle School	Sharon Elementary School	Windsor Elementary School
1A	Lighting Retrofit and Motion Sensors	✓	✓	✓	✓
1B	De-Stratification Fans	✓	✓	✓	✓
1C	Vending Misers	✓	✓	✓	
2A	Boiler/Burner Replacements		✓	✓	✓
2B	Domestic Hot Water (DHW) Heater Replacement		✓	✓	
2C	Boiler Burner Controls		✓		
2D	Kitchen Hood Controls	✓	✓		
2E	Walk-In Refrigerator/Freezer Controls	✓	✓		
2F	Solar Thermal Domestic Hot water	✓			
2G	RTU Cooling			✓	
3A	Building Management System Upgrades	✓	✓	✓	✓
3B	Demand Control Ventilation	✓	✓	✓	
4A	Building Envelope Improvements	✓	✓	✓	✓
4B	Roof Replacements		✓		
4C	Window Replacements			✓	
4D	Door Replacements			✓	
5A	Power Factor Optimization	✓	✓	✓	
5B	Transformer Replacement	✓	✓	✓	
5C	Premium Efficiency Motors and VFDs			✓	
6A	Water Conservation	✓	✓	✓	✓
6B	Steam Trap Replacement				✓
7A	Computer Monitor Replacements	✓	✓	✓	✓
7B	Virtual IT Work Stations	✓	✓	✓	✓
8A	Photovoltaic Array	✓	✓	✓	
9A	Demand Response	✓	✓	✓	

✓ Check marks indicate which buildings the Energy Conservation Measures will effect.

Overview

Honeywell has closely evaluated and audited the Robbinsville Public School District in order to develop the optimum mix of utility saving measures. These selected site-specific measures have been developed using the following process:

- ❖ Review Site Audits
- ❖ Engineering Team Site Visits
- ❖ Develop Measures
- ❖ Review Measures with Team

<u>Reject and Accept Measures Based On:</u>

1. Alignment with Critical Success Factors (CSF)
2. Value to the District
3. Economic Financial Payback
4. Equipment Service Life
5. Effect on Current Space Conditions

In developing the proposed measures, the following considerations were critical:

- Reduction of space heating and cooling loads by performing a systems review, with complete consideration of current indoor environmental quality standards.
- Review and redesign lighting systems noting reductions in the internal heat gain in the affected spaces.
- Load reduction measures always precede optimization measures.

<u>The following project goals, as called for in Request for Proposal (RFP), were also critical in the development of this Energy Savings Plan (ESP):</u>

- Automated heating and cooling controls with web based management
- High efficiency boilers and water heaters
- Lighting upgrades to high efficiency fluorescents
- Pond Road Middle School roof replacement
- Alternative energy systems
- Energy usage monitoring

Bin weather data, obtained through BinMaker PRO, was used from a 15 year average as reported from Trenton, NJ. Through a license agreement with ASHRAE, BinMaker PRO includes data from the revised and expanded 1997 ASHRAE Handbook of Fundamentals. The interactive ASHRAE design weather data viewer includes data on 1459 domestic and international locations.

Reasonable infiltration rates were assumed based on the building's fenestration conditions and expected values for typical school buildings. A reduced infiltration rate was assumed for the unoccupied hours. Envelope heat loss calculations assumed a reasonable heat transmission rate (U value) based on the construction of the buildings. (See Calculation sheet – Exhibit D5-4A.2 – D5-4A.5) Wall area and glass area were estimated by supplied drawings and field photographs.

Current efficiencies were derived from assumed and later to be measured boiler efficiencies, and assumed system losses due to thermal losses, distribution losses and loose operational control. The current assumed boiler system efficiencies were then applied to the calculated load and calibrated to last year's actual fuel consumption.

Demand Sensitive Operation

Review existing and proposed thermal loads. For example, the review process will facilitate the application of:

1. Optimized flow rates (steam, water, and air)
2. Optimized operation of equipment, matching current occupancy use profiles and considering both outside and indoor space temperatures.

Benefits of Mechanical Improvements

Listed below are some of the benefits that the District would reap from the mechanical portion of the measures:

1. Avoid costly repairs and replace equipment that would have to be replaced in the next five years.
2. Improved compliance with ASHRAE Ventilation Standards.
3. Ability to trend ventilation rates; thus, insuring compliance through documentation.
4. Operating a more weather sensitive facility.
5. Allowing for a greater capability of central monitoring and trouble shooting via remote.
6. Greater operating flexibility.

Indoor Air Quality

Implementation of new energy-related standards and practices has contributed to a degradation of indoor air quality. In fact, the quality of indoor air has been found to exceed the Environmental Protection Agency (EPA) standards for outdoor air in many homes, businesses, and factories.

The American Council of Governmental Industrial Hygienists (ACGIH) in their booklet "Threshold Limit Values," has published air quality standards for the industrial environment. No such standards currently exist for the residential, commercial, and institutional environments, although the ACGIH standards are typically and perhaps inappropriately used. The EPA has been working to develop residential and commercial standards for quite some time.

Recent studies indicate that for even the healthiest students, indoor air pollution can reduce the ability to learn. As an example, if you were to place a number of students in a room where it's hot, there's little or no air circulation and other children are coughing and sneezing, their ability to concentrate drops significantly. Honeywell has addressed this issue by focusing on the proper operation and replacement of the unit ventilators and air handler equipment which will assure IAQ standards are met.

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ECM 1A
Lighting Retrofit and Motion Sensors

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
1A	Lighting Retrofit and Motion Sensors	✓	✓	✓	✓

General Project Scope

All areas in the building were considered, including classrooms, gymnasiums, offices, utility and storage spaces and common area locations. The purpose was to evaluate potential energy usage reduction that met the financial model of the project while considering required light levels and existing fixture conditions. The enclosed designs will standardize the lighting systems utilized throughout the areas included providing a consistent visually pleasing environment while creating energy savings for Robbinsville Public Schools.

Facility Summary

Existing Conditions

Out of over 5,000 lighting fixtures identified over the entirety of the four facilities, over 63 percent of the identified fixtures contained either existing T8 or existing T12 linear fluorescent technology, with the split between the two technologies at 92 percent standard T8 and 8 percent T12. Overall the buildings that were audited were found to be in good/fair condition. Most of the existing fixtures currently contain T8 technology. The areas audited include offices, classrooms, gymnasiums, and common area locations. The purpose was to evaluate light levels, fixture condition, light distribution, and savings potential. Each space has been evaluated for appropriate light levels. In order to produce additional energy savings within these facilities existing fixtures will be retrofit with energy saving 28w lamps and high efficiency ballasts. A significant amount of maintenance will be reduced and deferred as a result of new lamps and ballasts.

More than half of the existing T8 fixtures are 2x4 recessed troffers containing 2, 3, or 4 standard T8 lamps and can be found in areas such as classrooms, offices, and hallways. Additionally, more than 25 percent of the existing T8 fixtures are 1x4 linear fluorescent surface mounted wrap fixtures containing standard T8 technology. These fixtures can be found in areas such as classrooms, bathrooms, and utility/storage areas. The remaining T8 fixtures are similar in styles and locations to the 1x4 fixtures, but are instead 1x8 fixtures containing either two or four standard T8 lamps. Also 11 percent of the existing T8 fixtures are 2x2 recessed fixtures containing U-shaped standard T8 technology. There are also existing linear fluorescent fixtures that currently contain T5 technology. The majority of these fixtures can be found in certain areas in Robbinsville High School such as some offices and classrooms. These fixtures are considered energy efficient and are not recommended for an energy upgrade at this time.

Almost half the existing T12 fixtures in the included facilities are 1x4 linear fluorescent fixtures containing various types of outdated lamps. These fixtures can be found in areas such as storage/utility areas, practice rooms, and some classrooms. Thirty percent of the existing T12 fixtures are 2x4 troffer fixtures containing three or four lamps. The remaining T12 fixtures are 2' or 3' linear fluorescent fixtures that currently contain either one or two lamps and can be found in areas such as storage areas and hallways.

There are also certain areas within the facilities that still contain outdated incandescent technology. Existing wattages range from 50w to 150w. In select areas, compact fluorescents have been installed to replace burnt out incandescent lamps. Incandescent lamps in exit signs have been replaced with LED lamps.

In interior areas such as the gymnasium in Robbinsville High School, existing high intensity discharge (HID) technology was found. HID fixtures use up far more wattage than their linear fluorescent counterparts and are considered in most applications to use excessive amounts of energy for the light output they provide. Additionally throughout much of the exterior, high wattage HID fixtures were found. In some instances low wattage applications such as parking lot lights were found. HID is a suitable technology to remain in place at the school. However, in many locations such as walls, entrances, and other similar locations, HID technology places an unnecessary burden on the energy demands of the facility.

Due to the differing lamp and ballast combinations, fixture quantities, and room dimensions, the audited areas have varying foot candle readings. The proposed ECMs have been designed to maintain or improve light levels where necessary.

Proposed Upgrades

Due to the amount of existing T12 and older T8 technologies present, as well as HID and incandescent fixtures, opportunities for energy conservation are present within the Robbinsville School District facilities included in the scope of work. Honeywell recommends upgrading existing T8 fluorescent technology with newer generation high efficiency T8 lamp and ballast technology. Additionally, Honeywell recommends replacing all existing incandescent lamps with compact fluorescents where applicable, and upgrading interior high intensity discharge fixtures with linear fluorescent T8 technology.

Existing standard efficiency T8 fluorescent lighting fixtures in areas that have burn hours that would allow for energy savings that meet the ROI standards of this lighting upgrade and existing fixtures that currently contain T12 technology will be retrofit with newer generation and higher efficiency T8 fluorescent systems. This retrofit involves the removal and disposal of existing lamps and ballasts, fixture cleaning, and the installation of the new high efficiency T8 fluorescent lamps and electronic ballasts. In areas where the fixtures were found to be in poor condition and no longer serviceable for retrofit and have burn hours that would allow for energy savings that meet the ROI standards of this lighting upgrade it is recommended that the fixtures be replaced.

The scope of work contains a mixture of T8 and T12 technology. Approximately 58% of the fixtures included in the scope of work currently contain standard T8 technology. The existing T8 fixtures included in this scope of work will be retrofit with 28w T8 lamps with either low-power or normal-power high efficiency ballasts.

The 28w T8 extended life lamps offer a reduced wattage per lamp with comparable lumen output capabilities of higher wattage T8 lamps and a higher quality of light output with a longer rated life expectancy.

The foot candles vary from room to room depending upon the location and in many areas such as certain hallways, classrooms, and bathrooms foot candle readings show light levels to be excessive, sometimes in the high 60s. Honeywell proposes the energy efficient strategy of de-lamping fixtures in the over-lit areas with 28 watt T8 lamps, a white reflector, and normal-power electronic ballasts depending upon the location. This design will generate far more savings than a simple re-lamp, while still providing sufficient light levels.

There are a number of high intensity discharge fixtures in areas such as gymnasiums. High intensity discharge lamps provide adequate light levels initially, however these lamps lose 50% of their lumen output during their life span. These lamps also produce high temperature levels, requiring vents along the top of the fixtures, resulting in accelerated dust and dirt accumulation within the inside of the fixture. This accumulation further decreases the lumen output of the fixture. T8 high-efficiency linear fluorescent technology has evolved within the past 10 years as an effective alternative to high intensity discharge (HID) systems for certain interior high bay applications. High lumen output T8 lamps, white reflectors, and innovative fixture designs make linear fluorescent lighting systems an efficient and effective replacement to traditional HID high bay lighting.

The proposed design for the gymnasium areas is to replace the HID fixtures on a one for one basis with low bay linear fluorescent fixtures, containing high efficiency T8 lamps and ballasts. This will reduce energy and materials costs, increase lamp life, consolidate materials, and provide balanced light disbursement.

Exterior HID

Where applicable, exterior HID fixtures found throughout these schools are currently being recommended for replacement with induction fixtures. Induction lighting technology is essentially a fluorescent lamp without electrodes. The electrode is the main failure mechanism in most light sources. With the absence of electrodes, the lamp relies on the fundamental principles of gas discharge and electromagnetic induction to produce light. The result of this is a lamp with an unmatched life span. Lasting up to 100,000 hours this system can last longer than 100 incandescent, 5 HID, or 5 typical fluorescent lamp changes. New Inductions fixtures will dramatically reduce maintenance costs and increase lamp life.

Occupancy Sensors

Implementation of lighting controls in administrative areas generates tangible energy savings because the installed sensors detect inactivity in a space and turn lights off when unoccupied. Although lowering kWh will always lower the electric bill, not every location benefits from the use of sensors. Areas that have relatively low operating hours and would only save an hour or two per day are usually not good candidates for sensors. Sensors should also not be used in areas that have frequent and constant traffic due to potential premature lamp and ballast failure caused by constant short cycling. Areas where sensors may be effective were evaluated.

The sensors use infrared technology to identify occupancy in the room being controlled. After a set time of inactivity, the sensor will turn off the lights and realize additional energy savings.

It is usually beneficial to install occupancy sensors in offices and bathrooms. Occupancy sensors can reduce energy consumption in offices by 30%, and up to 66% in low use offices. Typical bathrooms can see a 45-66% reduction in kWh energy consumption with the installation of occupancy sensors.

Certain areas, like some bathrooms or classrooms, have lighting designs that may not "see" occupants with a standard motion-detection occupancy sensor. In these areas, Honeywell recommends the installation of dual technology occupancy sensors. These controls utilize both infrared and ultrasonic technology to provide a more comprehensive coverage of the area being controlled

The complete scope of work is described in detail in the line by line spreadsheet Robbinsville Public Schools NJ in Section C of this document

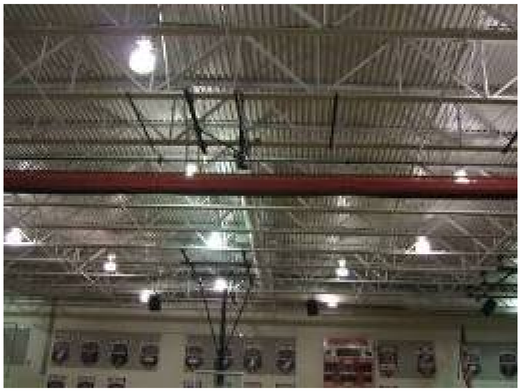
School Facility Summaries

Robbinsville High School

Robbinsville High School was built in 2003. It currently contains a mixture of T5, HID and T8 technology. The majority of the existing fixtures in Robbinsville High School are 1x4 4' 2-lamp and 2x4 4' 3-lamp T8 linear fluorescent recessed. These fixtures can be found in areas such as offices, hallways, and bathrooms. Honeywell recommends the energy efficient design of retrofitting the 1x4 fixtures with 28w high efficiency T8 lamps and high efficiency low-power ballasts, which will reduce kWh energy consumption by approximately 26%. Honeywell recommends the energy efficient design of de-lamping for about 50% of the 2x4 fixtures. This retrofit design involves 28w high efficiency T8 lamps, a white reflector and high-efficiency normal-power ballasts. The design of combining high efficiency T8 technology with a reduction in lamp quantity will provide additional energy savings per fixture. The addition of the reflector will increase the fixture efficiency and ensure that adequate light levels are maintained. This retrofit design will realize an estimated 42% reduction in kWh energy consumption. The remaining half of the 2x4 fixtures will be retrofit with 28w high efficiency T8 lamps and high-efficiency low-power ballasts. This design will reduce kWh energy consumption in these areas by approximately 25%.

Main Gymnasium

The existing fixtures in the main gymnasium are 400w metal halide fixtures. The fixtures that surround the basketball court in the main gym will be replaced with new 1.5x4 6-lamp T8 linear fluorescent low bay fixtures. These fixtures will contain (6) high lumen T8 lamps, white reflector, and normal power program start ballasts. The fixtures in the main gym that are located over the basketball court will be replaced with 2x4 8-lamp T8 linear fluorescent low bay fixtures. These fixtures will contain (8) high lumen T8 lamps, white reflector, and normal power program start ballasts. High lumen output T8 lamps, white reflectors, and innovative fixture designs make linear fluorescent lighting systems an efficient and effective replacement to traditional HID high bay lighting. These fixtures will also be equipped with wire-guards to protect the fixtures. Installing new 8-lamp low bay fixtures over the basketball court will significantly improve the light quality and light levels compared to the existing 400w metal halide fixtures.

High quality light along with increased light levels will benefit all activities that take place in the main gym. The main gymnasium has fixtures located over each of the basket nets and due to glaring issues these will be removed. The pair of fixtures that are currently located in front of each basketball net will be moved slightly closer to the basketball nets to compensate for the disconnected fixtures, but not close enough to cause glaring issues. Additionally, the fixtures will be dropped approximately 2' to put them in line with the existing rafters. This will reduce the amount of light that is currently blocked due to the rafters, and in turn make the new fixtures even more efficient. This design will reduce energy consumption and materials costs, increase lamp life, consolidate materials, and provide balanced light disbursement. The proposed 6-lamp design will reduce kWh energy consumption by approximately 65%. The proposed 8-lamp design will reduce kWh energy consumption by approximately 54%.

Auxiliary Gymnasium

The existing fixtures in the auxiliary gymnasium are 400w metal halide fixtures. All the fixtures in the auxiliary gym will be replaced with new 1.5x4 6-lamp T8 linear fluorescent low bay fixtures. These fixtures will contain (6) high lumen T8 lamps, white reflector, and normal power program start ballasts. These fixtures will also be equipped with wire-guards to protect the fixtures and occupancy sensors. Additionally, these fixtures will also be dropped approximately 2' to put them in line with the rafters which will allow more light to reach the gym floor. This design will reduce energy consumption and materials costs, increase lamp life, consolidate materials, and provide balanced light disbursement. The proposed 6-lamp design will reduce kWh energy consumption by approximately 65%.

Pole Barn

The Pole Barn building is a separate building that is located on the Robbinsville High School property. The building currently contains a majority of 400w metal halide fixtures. The fixtures can be found in shed areas. These fixtures will be replaced with new 1x8 industrial strip fixtures containing four T8 lamps, white reflector, and normal power ballasts.

The existing fixtures illuminating the parking lot for the high school are 400w Metal Halide fixtures. Honeywell recommends replacing these fixtures with new 200w Induction fixtures. These induction fixtures will provide better light while consuming considerably less energy. With a 100,000 hour service life these fixtures will greatly save the District in long term maintenance costs while providing an improvement in the quality of light at Robbinsville High School.

Theatre Room E10

The scope of work consists of disconnecting and removing the existing (4) 1x4 linear fluorescent wrap fixtures and replacing them with 165 watt pendant mount induction can fixtures in a new layout design. The proposed new layout would include (16) 165 watt pendant mount induction can fixtures. These fixtures would be mounted at 20 feet and would be uniformly spaced in approximately an 8'x15' grid. The proposed design would increase light levels in the room to meet classroom standards of 35 foot-candles.

Pond Road Middle School

Pond Road Middle School was found to be in good condition. The majority of the fixtures found throughout are 2x4 recessed troffer fixtures the currently contain 2, 3, or 4 standard T8 lamps. These fixtures can be found in areas such as classrooms, offices, and hallways.

The majority of the classrooms are currently illuminated by 2x4 T8 recessed troffer fixtures that currently contain three lamps. The classrooms are currently over-lit with an average of 62 foot candles. Honeywell recommends the energy efficient design of de-lamping in these areas with 28w high efficiency T8 lamps, a white reflector and high efficiency normal power ballasts. The design of combining high efficiency T8 technology with a reduction in lamp quantity will provide additional energy savings per fixture. The addition of the reflector will increase the fixture efficiency and ensure that adequate light levels are achieved and maintained.

The gym currently contains 400w metal halide fixtures. The existing foot candles are well below IES standards for a gymnasium with an average of 22 foot candles. These fixtures will be replaced with new low bay linear fluorescent fixtures containing eight high lumen T8 lamps, normal power program start ballasts, and a white reflector. These fixtures will also be equipped with wire-guards to protect the fixtures and the lamps will be equipped with tube guards to protect the lamps. The linear fluorescent technology will provide a more visually pleasing distribution of light verses the existing metal halides and will produce appropriate light levels that will achieve appropriate foot candles.

400w metal halide fixtures in gymnasium

Parking Lot Lights

This design will reduce energy consumption and materials costs, increase lamp life, and consolidate materials. Exterior fixtures, where applicable, will be replaced with new Induction technology. Existing high pressure sodium pole lighting, where applicable, will be replaced with fixtures with induction technology. In certain areas existing high pressure sodium exterior canopy fixtures will be replaced with compact fluorescent canopy fixtures. The proposed designs will reduce energy consumption while maintaining appropriate light levels.

Sharon Elementary School

1x4 2-lamp T8 surface wrap in classroom

250w metal halide fixtures in gymnasium

Sharon Elementary School was found to be in fairly good condition. The majority of the existing fixtures are surface mounted or recessed linear fluorescent fixtures that currently contain T8 technology. Fixture styles vary from area to area, ranging from 2x4 2, 3, and 4 lamp T8 linear fluorescent recessed fixtures to 1x4 and 1x2 surface wrap and strip fixtures. These fixture types can be found throughout classroom and office areas, as well as in the hallways. Honeywell recommends retrofitting the existing T8 technology with new high efficiency 28w T8 lamps and electronic ballasts.

The predominant existing fixture type that can be found in classrooms are 1x4 2-lamp T8 surface mounted linear fluorescent fixtures. Honeywell recommends retrofitting the existing standard T8 technology with new high efficiency 28w T8 lamps and electronic low power ballasts. There are also several 2x4 4-lamp T8 linear fluorescent recessed troffer fixtures in classrooms. The light levels were found to be excessive in these classrooms and they will be de-lamped to two 28w T8 lamps with normal power ballasts. Both proposed designs will reduce energy consumption in the classrooms while maintaining appropriate light levels.

The gym currently contains 250w metal halide fixtures. The light levels in the gymnasium were found to be below recommended IES standards with an average of 14 foot candles. Honeywell recommends replacing these fixtures with new low bay linear fluorescent fixtures containing eight high lumen T8 lamps, normal power program start ballasts, and a white reflector. These fixtures will also be equipped with wire-guards to protect the fixtures and the lamps will be equipped with tube guards to protect the lamps. The proposed design will reduce kWh energy consumption and increase the light levels.

400w metal halide fixtures in cafeteria/auditorium

The cafeteria/auditorium also currently contains metal halide fixtures. In an effort to maintain the existing light levels, and to allow for consistency in maintenance stock the existing 400w metal halide fixtures will be replaced in these areas as well with new low bay linear fluorescent fixtures containing six high lumen T8 lamps, normal power program start ballasts, and a white reflector. These fixtures will also be equipped with wire-guards to protect the fixtures and the lamps will be equipped with tube guards to protect the lamps.

Exterior incandescent fixtures, where applicable in the courtyard will be retrofit with compact fluorescent technology.

Windsor Elementary School

1x4 2-lamp T12 industrial strip in classroom

1x4 2-lamp T12 wrap fixtures in faculty lounge

Windsor Elementary School was found to be in fairly good condition. The school is over 100 years old and is comprised of only three classrooms and a cafeteria. The basement is used as the faculty lounge and for storage. The basement/faculty lounge areas have deteriorated and new fixtures are needed. The majority of the existing fixtures are surface mounted linear fluorescent fixtures or industrial strip linear fluorescent fixtures mounted with jack chain that currently contain T12 technology. These fixture types can be found throughout classroom, cafeteria, and office areas. Honeywell recommends retrofitting the existing T12 technology with new high efficiency 28w T8 lamps and electronic ballasts. In areas where the fixtures are no longer serviceable for retrofit the fixtures will be replaced with new fixtures containing new high efficiency 28w T8 lamps and electronic ballasts.

The predominant existing fixture type that can be found in classrooms are 1x4 2-lamp T12 industrial strip linear fluorescent fixtures. Honeywell recommends retrofitting the existing standard T12 technology with new high efficiency 28w T8 lamps and electronic low power ballasts.

The faculty lounge/ basement currently contains 1x4 2-lamp T12 linear fluorescent surface mounted wrap fixtures. These fixtures were found to be in poor condition. Honeywell recommends replacing these fixtures but in an effort to reduce the ROI for this school these fixtures will be retrofit on a one for one basis with 28w T8 lamps and low power ballasts. The proposed design will reduce kWh energy consumption while maintaining appropriate light levels.

There are no exterior fixture replacements recommended for this facility

Changes in Infrastructure

New lamps and ballasts will be installed as part of this ECM.

Customer Support and Coordination with Utilities

Coordination efforts will be needed to reduce or limit impact to building occupants.

Environmental Issues

Resource Use	Energy savings will result from reduced electric energy usage.
Waste Production	All lamps and ballasts that are removed will be properly disposed.
Environmental Regulations	No environmental impact is expected.

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ECM 1B
De-stratification Fans

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
1B	Destratification Fans	✓	✓	✓	

Existing Conditions

In high ceiling areas such as in a gymnasium and/or cafeteria, warm air stratifies close to the ceiling. Elevated levels of heat transfer through the high walls and roof causes substantial heat loss.

Proposed Upgrades

In the school gyms with 20+-foot ceilings, there is approximately a 15°F+ temperature difference between the floor and the ceiling. With higher ceilings it is even more. That means to generate the heat necessary to maintain a comfortable 70°F temperature at the floor level, where student activities occur, the ceiling could be 85°F or higher.

De-stratification fans de-stratify the air to a zero to 3 deg F differential from floor to ceiling and wall to wall. This will allow HVAC systems to have less running time because of the absence of extreme temperatures to heat or cool, thus allowing the local thermostats to be satisfied for longer periods of time.

Systems Evaluation and Selection

An energy-efficient motor drives a near-silent fan that aerodynamically and quietly forces a column of hotter air from the ceiling area to the cooler floor below. As this column of warm air nears the floor, it begins to flare out in a circular pattern and rise again creating a torus. While doing so, it warms the cooler air it mixes with near the floor increasing the temperature of the air and floor where people live and work. Through a natural law of physics, this torus will continue to re-circulate air through the de-stratification fan suspended near the ceiling and continue mixing warmer air from the ceiling with cooler air near the floor until the ceiling and air temperatures are nearly equal.

As this happens, it will require less and less energy to comfortably heat the work area, allowing thermostats to be lowered and energy savings to be realized. Once started, the entire process of "thermal equalization" will take on average less than 24 hours.

Based on preliminary site investigation conducted by our staff, we propose to install the following as indicated in the table below:

School	Location	Qty	Type
Robbinsville HS	Main Gymnasium	15	Air Pear 25
Robbinsville HS	Auxiliary Gymnasium	8	Air Pear 25
Robbinsville HS	Cafeteria	10	Air Pear 25
Pond Road MS	Gymnasium	12	Air Pear 45
Sharon ES	Gymnasium	8	Air Pear 25
Sharon ES	Cafetorium	3	Air Pear 25

Table 2J.1 – Proposed De-stratification Fans

Scope of Work:

Per De-stratification Unit:

- Shut off the main electric power to the area in which the unit(s) will be installed.
- Install new De-stratification Fan and wiring
- Re-energize
- Inspect unit operation by performing electrical and harmonics testing

Changes in Infrastructure
New Destratification Fans will be installed as part of this ECM.

Customer Support and Coordination with Utilities
Coordination efforts will be needed to reduce or limit impact to building occupants.

Environmental Issues

Resource Use	Energy savings will result from reduced thermal energy usage. A slight increase in electrical energy is resultant from the run time of the fan motors.
Waste Production	None
Environmental Regulations	No environmental impact is expected.

ECM 1C
Vending Misers

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
1C	Vending Misers	✓	✓	✓	

The Robbinsville- Regional School District has plug loads, such as vending machines at multiple schools. As such, Honeywell has investigated the use of plug controllers for these areas.

Existing Conditions

Vending machines are located throughout the facilities, offering soft drinks to the occupants. A typical cold drink machine consumes over 5,000 kWh annually.

Vending Machines found in Robbinsville Schools would benefit from the installation of Vending Miser controls. It is recommended that Vending Miser controls be installed on vending machines in some areas of the high school. The Vending Miser control system reduces the energy consumption of vending machines by controlling the run-time of the machine. By employing a passive infrared sensor, the Vending Miser control powers down the lights on a vending machine when the surrounding area is unoccupied and resumes power when occupancy in the area is detected. The sensor also monitors the ambient temperature within cold drink machines to ensure the products in the machine stay cold and powers up the compressor when needed regardless of occupancy. This technology has been proven to significantly reduce energy consumption when installed in appropriate areas.

Building	Type	Location	Qty
Robbinsville HS	Dasani	Cafeteria	1
Robbinsville HS	Snapple	Cafeteria	1
Robbinsville HS	Minute Maid	Cafeteria	1
Robbinsville HS	Snack	Cafeteria	1
Robbinsville HS	Dasani	Auxiliary Gym	1
Robbinsville HS	Dasani	Main Gym	1
Pond Middle School	Dasani	Faculty Lounge	1
Pond Middle School	Snack	Faculty Lounge	1
Sharon Elementary School	Dasani	Faculty Lounge	1
Total			**9**

Table 1C.1 – Existing Vending Machines

Proposed Solution

During the site visit, Honeywell noted vending machines providing the opportunity for energy savings by shutting off non-critical loads during the non-occupied periods.

To control the vending machines, Honeywell proposes to install a vending machine occupancy controller (VMOC) to manage the power consumption. Utilizing a Passive Infrared (PIR) Sensor, the VMOC completely powers down a vending machine when the area surrounding it is unoccupied. Once powered down, the VMOC will monitor the room's temperature and use this information to automatically re-power the vending machine at one to three hour intervals, independent of occupancy, to ensure that the vended product stays cold.

The VMOC also monitors electrical current used by the vending machine. This ensures that the unit will never power down a vending machine while the compressor is running, so a high head pressure start never occurs. In addition, the current sensor ensures that every time the vending machine is powered up, the cooling cycle is run to completion before again powering down the vending machine. The Coca Cola Company and Pepsi Corporation approve the proposed controller for use on their machines.

Interface with Existing Equipment

All of the plug load control devices are easily installed. The vending machine controllers are installed separately from the machine, and implementation will occur during working hours. A period of three (3) weeks will be required to make sure of proper calibration of the sensors.

With respect to the vending machines in your facilities, Honeywell has estimated the number and types of vending machines. During the implementation phase, Honeywell will check with the vendor about the type and specification of the vending machines as it relates to any internal time clocks which may exist inside the machine. Should this be the case, the savings and cost will be adjusted accordingly.

ECM 2A
Boiler Replacements

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
2A	Boiler Replacements		✓	✓	✓

Existing Conditions

In general, the boilers in the Robbinsville- school district have been well maintained which has resulted in additional years of useful life. Pond Road MS, Sharon ES currently have boilers that are original to the buildings. The Windsor ES Boiler has been upgraded, but still fires off #2 fuel oil rather than natural gas.

Pond Road MS Boiler

Sharon ES Boiler

Existing Conditions					
School	Boiler Make	Boiler Model	Qty	Input	Fuel
Pond Road MS	Weil McLain	1794	2	5773 MBH	Gas
Sharon ES	HB Smith	350 Mills	1	2675 MBH	Gas
Sharon ES	HB Smith	350 Mills	1	2496 MBH	Gas
Windsor	HB Smith	28A-5	1	1192 MBH	Oil

Table 2A.1 – Existing Boilers

Proposed System and Scope of Work

It is recommended to replace the boilers listed in Table 3.2 at Sharon ES and Pond MS only. The Windsor boiler is currently firing on oil and due to the low price of natural gas Honeywell is recommending a dual fuel burner to take advantage of both fuel types. This will result in lower operational and maintenance cost, while providing the district with more efficient equipment.

Accordingly Honeywell proposes to install new high efficiency condensing boilers at Sharon and Pond with the same output capacity as listed in Table 3.2

The following table indicates the size of the new boilers:

Proposed Solution						
School	Boiler Make	Boiler Model	Qty	Input	Fuel	
Pond Road MS	Aerco	Bench Mark 2.0	3	3000 MBH	Gas	Upgrade
Sharon ES	Aerco	Bench Mark 2.0	1	2000 MBH	Gas	Upgrade
Sharon ES	Aerco	Bench Mark 2.0	1	2000 MBH	Gas	Upgrade
Windsor	HB Smith	28A-5	1	1192 MBH	Natural Gas/Oil	Upgrade Burner Only

Table 2B.2 – Proposed Boiler Equipment

Scope of Work:

The following outlines the boiler replacement:

- Disconnect gas back to shutoff valve and electric back to source panel-board.
- Remove existing boilers
- Connect gas to new boilers
- Terminate and power new boiler electric circuiting.
- Start up and commissioning.
- Operator(s) training.

Energy Savings Methodology and Results

In general, Honeywell uses the following approach to determine savings for this specific measure:

Existing Boiler Efficiency	= Existing Heat Production/ Existing Fuel Input
Proposed Boiler Efficiency	= Proposed Heat Production/ Proposed Fuel Input
Energy Savings $	= Heating Production (Proposed Efficiency – Existing Efficiency)

Equipment Information

Manufacturer and Type	Several quality and cost effective manufacturers are available. Honeywell and the customer will determine final selections.
Equipment Identification	As part of the ECM design and approval process, specific product selection will be provided for your review and approval.

Changes in Infrastructure
New boiler will be installed in itemized locations; in addition, training for maintenance personnel will be required as well as an annual maintenance contract with the manufacturer.

O&M Impact
The new boilers will decrease the O&M cost significantly for maintaining the boilers.

Customer Support and Coordination with Utilities
Minor support will be required for the interruption of utilities for brief tie-in periods. Continuity of service must be maintained for the customer.

Environmental Issues

Resource Use	Energy savings will result from greater combustion efficiency, reduced maintenance costs, control and setback.
Waste Production	This measure will produce waste by-products.
Environmental Regulations	Environmental impact is expected; all regulations will be adhered to in accordance with EPA and local code requirements.

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ECM 2B
DHW Heater Replacements

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
2B	DHW Heater Replacements		✓	✓	

Existing Conditions

Domestic Hot Water (DHW) at Pond Road MS and Sharon ES are provided by an older gas-fired hot water heaters that are inefficient compared to today's standards. The older heater/burner design and age of the unit contribute to a much lower efficiency than the new condensing hot water heaters.

Pond Road DHW Heater

Sharon DHW Heater

Building	EXISTING					
	Boiler Make/Heat Exchanger	Boiler Model	Qty	Input	Efficiency	Storage Gallons
Pond Road MS	AO Smith	HW 399932	2	399 MBH	81%	69
Sharon ES	AO Smith	BTC305A	1	305 MBH	80%	75

Table 2B.1 – Existing Domestic Hot Water Heaters

Proposed Solution

Honeywell proposes replacing the existing DHW system at Pond Road MS and Sharon ES with a new high efficiency hot water heater. One solution at Pond Road MS is to split the DHW heaters to have a dedicated unit for the cafeteria kitchen and a separate system for the balance of the school which serves the lavatories, locker rooms and other areas where hot water is required. Based on existing storage capacity and student population, DHW heater sizes were reduced in accordance with the AO Smith sizing tool Pro-Size.

Building	PROPOSED					
	Boiler Make	Boiler Model	Qty	Input	Efficiency	Storage Gallons
Pond Road MS	AO Smith	Cyclone Xi BTH -200	2	199 MBH	94%	100
Sharon ES	AO Smith	Cyclone Xi BTH -200	1	199 MBH	94%	100

Table 2B.2 – Proposed Domestic Hot Water Heaters

Benefits

The new boiler will not only reduce the gas consumption as a result of the efficiency differences between the existing boilers and new boilers, but will also reduce maintenance costs.

Energy Savings Methodology and Results

The savings are calculated from the boiler efficiency differences.

Existing Boiler Efficiency	= Existing DHW Production/ Existing Fuel Input
Proposed Boiler Efficiency	= Proposed DHW Production/ Proposed Fuel Input
Energy Savings $	= DHW Production (Proposed Efficiency – Existing Efficiency)

Changes in Infrastructure

A new controller for each boiler will be installed and programmed. In addition to the controllers, training for maintenance personnel will be required.

Equipment Information

Manufacturer and Type	Several quality and cost effective manufacturers are available. The above is an example of equipment that may be utilized. Honeywell and the Robbinsville School District will determine final selections.
Equipment Identification	As part of the measure design and approval process, specific product selection will be provided for your review and approval.

Customer Support and Coordination with Utilities

Minor support will be required for the interruption of utilities for brief tie-in periods.

Environmental Issues

Resource Use	Energy savings will result from greater boiler load control.
Waste Production	This ECM will produce no waste by-products.
Environmental Regulations	No environmental impact is expected.

ECM 2C
Boiler Controllers

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
2C	Boiler Controllers		✓		

Existing Conditions

Honeywell has evaluated each building's heating and domestic hot water equipment and distribution systems to identify areas for boiler plant optimization. Currently, the existing boilers only have limited or no fuel / air ratio controls in place.

Proposed Solution

Typically, boilers are sized to accommodate the coldest days (5% of a year). During these periods of maximum demand, the burner is constantly on and the boiler is operating at maximum capacity. At all other times, the burner cycles on and off maintaining temperature or pressure in the boiler. It is during these periods of lesser demand, that the controller will monitor the boiler make up rate, and efficiently manage the firing of the boiler.

The length of the burner's off-cycle is the best measure of total heating demand or load. In other words, the load is directly related to the time it takes for water (or steam) in the boiler to drop from its high-limit temperature (or pressure) to its low-limit or "call" setting. When demand is high, these off-cycles are short and the on-cycles are longer. When demand is lower, off-cycles are longer and on-cycles are reduced.

The device, which is a microprocessor based computer, constantly monitors the demand on the boiler by assimilating all factors affecting a buildings heating requirements, including occupancy, climate, wind chill, solar gain, type of building, and many others.

Proposed Systems and Scope of Work

As an alternative to boiler replacement, Honeywell will retrofit the existing Burner Management System on boilers with Honeywell Controlinks™ linkageless Fuel/Air Ratio Control system.

Honeywell Controlinks™ will integrate with the existing Burner Management Flame Safe Guard Controller (FSG) to monitor and control the burner fuel and air ratios to maintain proper combustion. The single actuator will be replaced with separate Direct Coupled Actuators (DCA) for air and fuel(s) and will be connected to the existing burner control.

This retrofit will provide a combustion curve and light-off points including minimum/maximum firing rate points resulting in a precise firing rate control over the entire firing rate of the burner. Combustion efficiency will be maximized throughout the combustion curve and will provide a fuel curve, achieving maximum efficiency.

Pond Road MS Boiler Burner

Pond Road MS Boiler Burner

Scope of Work, Honeywell Control Links Controllers

Honeywell Controlinks controllers will be installed on the following boiler burners:

School	Boiler Make	Boiler Model	Qty	MBH	Burner Make	Burner Model	Rating Gas MBH
Pond Road MS	Weil McLain	1794	2	5773	Preferred Utilities	RP 045 3A4	6062 MBH

Table 2C.1 – Existing Boilers to be Installed with Control Links

Combustion efficiency will be maximized throughout the combustion curve and will provide fuel curves, achieving maximum efficiency.

Energy Savings Methodology and Results

The savings approach is based upon reducing the amount of boiler on time without reducing the heating response time or system capacity in response to warmer periods of the year and when demand for heating is low or non-existent. The relative savings is based upon the ratio of off time to burn time and the magnitude can vary from 10% to 15%. Honeywell uses a conservative 5% reduction of the base year fuel input.

Honeywell Controlinks is a patented burner control unit. This unit eliminates mechanical linkages in the traditional burners and replaces the same with electronic equivalents. This eliminates the sluggish operation of the linkages and decreases response time drastically. The air fuel ratio is therefore maintained accurately resulting in fuel savings. Case studies have shown that fuel savings range from 4-8% - Honeywell uses 5% savings to be conservative

Changes in Infrastructure

A new controller for each boiler will be installed and programmed. In addition to the controllers, training for maintenance personnel will be required.

Equipment Information

Manufacturer and Type	Several quality and cost effective manufacturers are available. The following is an example of equipment that may be utilized. Honeywell and the Robbinsville- School District will determine final selections.
Equipment Identification	As part of the measure design and approval process, specific product selection will be provided for your review and approval.

Customer Support and Coordination with Utilities

Minor support will be required for the interruption of utilities for brief tie-in periods.

Environmental Issues

Resource Use	Energy savings will result from greater boiler load control.
Waste Production	This ECM will produce no waste by-products.
Environmental Regulations	No environmental impact is expected.

Utility Interruptions

Proper phasing procedures will minimize gas interruptions to building.

Agency Support Required

Agency support will be determined upon acceptance of final design.

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ECM 2D
Kitchen Hood Controllers

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
2D	Kitchen Hood Controllers	✓	✓		

Existing Conditions

The kitchens in the Robbinsville- School District currently utilize a constant volume kitchen exhaust hood system. This system operates at full load, even when there is no activity in the kitchen. It also requires operating the exhaust fan at full load. This not only wastes fan energy, but also the heating energy. When the hood is not utilized, an opportunity exists to reduce airflow, and consequently, conserve energy.

Typical Hood Controller


Typical Kitchen Hood

Proposed Solution and Scope of Work

Honeywell recommends installing an automated DDC control system to control the hood exhaust fan, to ensure the optimal hood performance and to conserve energy. The control system will include the input/output processor and keypad. Variable frequency drives will be mounted on the utility cabinet. The temperature sensor will be mounted in the exhaust duct and the optic sensor will be mounted inside the ends of the hood. The following schools are included:

School	Number of Hoods
Robbinsville - HS	2
Robbinsville - MS	1

Table 2D.1 – Existing Kitchen Hoods to be Installed with Controllers

The scope of work is as follows:

- Install a variable speed drive in a NEMA approved enclosure for the kitchen hood exhaust fan.
- Reconfigure existing power wiring through the variable speed drives.
- Provide a motion sensor and an optical sensor at the kitchen exhaust hood to determine use.
- Provide variable speed drive control points for start/stop, speed and alarm.
- Provide control logic and software to accomplish sequences and incorporate into DDC system.
- Commission control components and sequences, and calibrate control loops.

Energy Savings Methodology and Results

The savings approach is based upon reducing the amount of conditioned air that is being exhausted when there is no cooking taking place. The savings are generally calculated as:

Existing Heating BTU & Cost per BTU	= Metered Data from Existing meter readings
Cost of Existing Heating	= Average Site Data $/CCF or $/Gallon
Reduction in Heating BTU	= Exhaust air cfm x 1.08 x Delta T x Hours the fan is off.
Cost of Proposed Heating	= Existing BTU x Cost per BTU
Energy Savings $	= Existing Heating Costs – Proposed Heating Costs

The baseline adjustment calculations are included with the energy calculations.

Changes in Infrastructure

There will be improvements in HVAC equipment and controls for not operating fans continuously.

Customer Support and Coordination with Utilities

Minor support will be required for the interruption of utilities for brief tie-in periods.

Environmental Issues

Resource Use	Energy savings will result from reduced energy.
Waste Production	Any removed parts will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 2E
Walk-In Refrigerator/Freezer Controllers

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
2D	Walk-In Refrigerator/Freezer Controllers	✓	✓		

Existing Conditions
In many refrigeration walk-in freezers and coolers, the compressor is oversized and cycles on/off frequently. This compressor cycling results in higher energy consumption and may reduce the life of the compressor.

Walk-In Refrigerator/Freezer

Freezer/Refrigerator Condensing Units

School	Walk-In Refrigerators	Walk-In Freezers
Robbinsville HS	1	1
Pond Road MS	1	1

Table 2L.1 – Existing Walk-In Refrig./Freezers to be Installed with Controllers

Proposed Solution
Honeywell will install a controller refrigeration sensor at above-mentioned schools as made by Intellidyne, to reduce the compressor cycles of the kitchen walk-in coolers and freezers. The installation of this ECM will have no negative impact on system operation and freezing of food products. By reducing the cycling, the sensor will improve operating efficiency and reduce the electric consumption by nearly 10% to 20%. This control enhancement will save energy through the reduced compressor cycling in the kitchen walk-in coolers and freezers and will extend the operating life of the compressor. Consequently, the compressor will not have to be replaced as often.

Intellidyne Features

- 15 Year full replacement warranty
- Automatic restart on power failure
- Surge protection incorporated into circuitry
- Fully compatible with all energy management systems
- UL listed
- NYSERDA tested
- Maintenance free

Intellidyne Benefits

- Patented process reduces air conditioning electric consumption typically 10% to 20%
- UL listed, "Energy Management Equipment"
- Increased savings without replacing or upgrading costly system components
- "State-of-the-art" microcomputer controller – LED indicators show operating modes
- Protects compressor against momentary power outages and short cycling
- Simple 15-minute installation by qualified installer
- No programming or follow-up visits required
- Maximum year-round efficiency

Intellidyne's patented process determines the cooling demand and thermal characteristics of the entire air conditioning system by analyzing the compressor's cycle pattern, and dynamically modifies that cycle pattern to provide the required amount of cooling in the most efficient manner. This is accomplished in real-time by delaying the start of the next compressor "on" cycle, by an amount determined by the cooling demand analysis. These new patterns also result in less frequent and more efficient compressor cycles.

Energy Savings Methodology and Results

The energy savings for this ECM is realized by the reduction in run time of the compressors and fan motors in the freezers/refrigerators.

Changes in Infrastructure

None.

Customer Support and Coordination with Utilities

Minor support will be required for the interruption of utilities for brief tie-in periods.

Environmental Issues

Resource Use	Energy savings will result from reduced energy.
Waste Production	Any removed parts will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 2F
Solar Thermal DHW

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
2F	Solar Thermal DHW	✓			

Existing Conditions

Currently, Robbinsville HS uses its two (2) Broad Spectrum Gas Fired Chillers to make Domestic Hot Water (DHW) year round.

Existing Domestic HW Indirect Fired Units

Existing Domestic Hot Water Heater

Building	EXISTING					
	Boiler Make	DHW HX	Qty	Capacity	Efficiency	Storage Gallons
Robbinsville HS	Broad Spectrum	Ajax Boiler	2	1000 MBH	80%	605

Proposed System and Scope of Work

This ECM proposes to install a solar thermal DHW system to supplement the existing system during shoulder months when the absorption chillers are not required for heating or cooling.

The following table indicates the sizes and quantities of new hot water heaters:

Building	PROPOSED					
	Type	System	Qty	Collectors	Heat Exchanger	Storage Gallons
Robbinsville HS	Solar	Closed Loop Hot Water	1	Flat Plate Solar Thermal Collector	Immersed	Will use existing

<u>Scope of Work:</u>

The following outlines the recommended domestic hot water heating boiler system modifications for each building:

- Furnish and install new domestic hot water solar thermal system.
- Furnish and install piping to thermal system.
- Rigging and setting in place above-described new equipment.
- Reconnect the existing domestic water piping to the existing storage tanks.
- Insulation of new hot water piping.

<u>Changes in Infrastructure</u>

New energy-efficient solar thermal heaters will be installed in the boiler room with collectors on the roof.

<u>Support and Coordination with Utilities</u>

Coordination of the tie in to the domestic hot water system.

<u>Environmental Issues</u>

Resource Use	Energy savings will result from reducing electrical usage by operating high-efficiency heat transfer equipment that utilizes the lowest cost per Btu.
Waste Production	All disposals will be in accordance with all the applicable codes.
Environmental Regulations	All required permits and application would be handled.

<u>Equipment Information</u>

Manufacturer and Type	Several quality and cost effective manufacturers are available. Honeywell and the customer will determine final selections.
Equipment Identification	As part of the ECM design and approval process, specific product selection will be provided for your review and approval.

ECM 2G
RTU Cooling

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
2G	RTU Cooling			✓	

Existing Conditions
Currently there is no cooling in the original wings of the Sharon Elementary school. The classrooms were renovated back in the 1990's and univents with DX cooling were installed in the ceilings. However the DX cooling condensers where never installed and the units have been functioning as ordinary H&V units.

Sharon Roof showing OA Penetrations

Proposed Solution
Honeywell is proposing to install Rooftop Unit (RTU) and Air Handling Unit (AHU) cooling coils with Condensing Units (CU) to serve classroom, multipurpose room and administration spaces at Sharon ES. The new units will be installed on the same roof and ducted down to the spaces they serve. The new units will be equipped with factory installed microprocessor controls that improve unit efficiency. The units will also communicate with the existing building management system.

School	Location Served	Quantity	RTU Tonnage Per Unit	Type	New SEER
Sharon ES	Classrooms	1	50	RTU -1	>11
Sharon ES	Classrooms	1	50	RTU -1	>11
Sharon ES	Multipurpose Room AHU-1	1	50	CU-1	>11
Sharon ES	Toilet Rooms AHU-2	1	3	CU-2	>13

Table 2G.1 – Existing RTU to be Replaced

Scope of Work:

RTU- 1

1. Furnish and install a new 50 Ton High Efficient Roof Top Unit with Curb & accessories.
2. Furnish and install a roof duct distribution system to the existing room ceiling mounted fan coil units.
3. Insulate Ductwork as required.
4. Furnish and install roof penetrations for the ductwork.
5. Furnish and install Electrical service to the new roof top unit.
6. Furnish rigging service as required.
7. Startup new roof top unit.

RTU-2

1. Furnish and install a new 50 Ton High Efficient Roof Top Unit with Curb & accessories.
2. Furnish and install a roof duct distribution system to the existing room ceiling mounted fan coil units.
3. Insulate Ductwork as required.
4. Furnish and install roof penetrations for the ductwork.
5. Furnish and install Electrical service to the new roof top unit.
6. Furnish rigging service as required.
7. Startup new roof top unit.

Existing Multipurpose Room AHU- 1, 50 Ton Condensing Unit, Refrigerant Coil & Refrigerant Piping

1. Furnish and Install (1) 50 Ton Condensing Unit and Matching Refrigerant coil in the existing AHU # 1
2. Furnish and install new refrigerant suction & liquid lines to the New Coil.
3. Evacuate & Charge Suction & Liquid Lines as Required
4. Furnish and install new Electric Wiring to the Condensing Unit.
5. Furnish and Install New Roof Rails & Roof Cut & Patch for the Condensing Unit.
6. Test & Startup of Unit.

Existing Toilet Room AHU- 2, 3 Ton Condensing Unit, Refrigerant Coil & Refrigerant Piping

1. Furnish and Install (1) (3) Ton Condensing Unit and Matching Refrigerant coil in the existing AHU # 2
2. Furnish and install new refrigerant suction & liquid lines to the New Coil.
3. Evacuate & Charge Suction & Liquid Lines as Required.
4. Furnish and install new Electric Wiring to the Condensing Unit.
5. Furnish and Install New Roof Rails & Roof Cut & Patch for the Condensing Unit.
6. Test & Startup of Unit.

Energy Savings Methodology and Results

The savings approach is based on the energy efficiency between the existing and new units. The savings are generally calculated as:

Electric Energy Cost	New unit energy consumption (kWh)

Equipment Information

Manufacturer and Type	Several quality and cost effective manufacturers are available. Honeywell and the Robbinsville School District will determine final selections.
Equipment Identification	Product cut sheets and specifications are available upon request. As part of the measure, design and approval process, specific product selection will be provided for your review and approval.

Customer Support and Coordination with Utilities

Coordination of the electrical tie-in will be required.

Environmental Issues

Resource Use	Energy savings will result from higher efficiency units.
Environmental Regulations	No environmental impact is expected.

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ECM 3A
Building Management System / Control Upgrades

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
3A	Building Management System / Control Upgrades	✓	✓	✓	✓

Robbinsville High School

Existing Condition
There are multiple temperature control systems throughout the Robbinsville Public School District. These include front-end systems manufactured by Delta, Staefa and Honeywell. There are also pockets of additional standalone temperature control systems such as Honeywell Excel 15/10, McQuay Microtech, Delta Controls and pneumatics. Each of these systems operates independently, which may result in competing mechanical systems and excessive energy consumption. The lack of a graphical user interface for various control systems in Sharon Elementary School and Pond Road Middle School makes monitoring of equipment, adjustment of control parameters and modification of operating schedules extremely limited if at all possible.

Proposed Condition
Upgrade the existing pneumatic and electronic controls to the latest Honeywell direct digital controller technology. Leverage the existing Robbinsville IT network in order to incorporate the new controls into the recently installed Honeywell Enterprise Buildings Integrator (EBI) system located in the Pond Road Middle School. A dedicated EBI workstation shall be installed at Sharon Elementary School for local access and control. A secure web-based portal shall be established allowing building operators to access the EBI system from any standard computer via the internet. Three dimensional graphical representations of all connected heating and air conditioning equipment shall be added to the EBI system to allow for intuitive control, monitoring and scheduling of all systems.

Scope of Work

A. Existing Honeywell Enterprise Buildings Integrator (EBI) System

1. Upgrade and expand the existing Pond Road Middle School EBI Server License as required to accommodate the Robbinsville District's new controls. Expansion shall include the following:
   a. EBI R410 Server Upgrade
   b. 2500 Additional Point Capacity
2. Provide and install one (1) additional EBI workstation located at the Sharon Elementary School in the Mechanical Equipment Room of the new Addition.
3. Establish connectivity between the Pond MS EBI Server and the new Sharon ES EBI Workstation via the Robbinsville School District's IT network.

Sharon Elementary School

Existing Condition

There are multiple temperature control systems in the Sharon Elementary School including an original pneumatic system, individual McQuay MicroTech unit ventilator controllers and a Staefa Control system serving the 2001 Addition. Each system operates independently, which may result in competing mechanical systems and excessive energy consumption. The Staefa Control system appears to be operational; scheduling equipment operation and allowing for equipment monitoring. However, the Staefa ms1800 software application does not allow for straightforward adjustment of system parameters and remote access to the system is not available. Further, the Staefa ms1800 application utilizes the Windows 95 operating system, which is no longer supported by Microsoft.

Original Pneumatic System Controls

Existing Staefa Control System Workstation Graphic of AHU-2 (Gym)

Proposed Condition

Upgrade the existing pneumatic, electronic unit ventilator thermostat controls and the Staefa Control system to the latest Honeywell direct digital controller technology. Leverage the existing Robbinsville IT network in order to incorporate the new controls into the recently installed Honeywell Enterprise Buildings Integrator (EBI) System located in the Pond Road Middle School.

Scope of Work

A. Original Boiler Room: New Hot Water System, B-1, B-2, HWP-1, HWP-2

1. Provide and install one (1) Honeywell Direct Digital Controller configured to accommodate the required input/outputs.
2. Furnish and install temperature and pressure sensing devices.
3. Furnish differential pressure control valve for installation by mechanical contractor.
4. Extend signal wiring from direct digital controller to all sensing, control and monitored devices.
5. Program controller as required to perform the specified energy conservation sequence of operations.
6. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
7. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
8. Generate a 3-dimensional graphical representation of the hot water system allowing building operators to monitor the equipment and adjust operating parameters.
9. Establish a hot water system operating schedule consistent with the facilities occupancy profile.
10. Commission the controls to verify and document proper operation.

New Hot Water System Control/Monitoring Points:

1. Outside Air Temperature
2. Outside Air Relative Humidity
3. Boiler No.1 Enable

4. Boiler No.1 HW Setpoint
5. Boiler No.1 Alarm
6. Boiler No.2 Enable
7. Boiler No.2 HW Setpoint
8. Boiler No.2 Alarm
9. Hot Water Supply Temperature
10. Hot Water Return Temperature
11. Hot Water Pressure Bypass Control Valve
12. Hot Water System Differential Pressure
13. Hot Water Pump No.1 Start/Stop
14. Hot Water Pump No.1 Status
15. Hot Water Pump No.1 VFD Speed Setpoint
16. Hot Water Pump No.1 VFD Fault
17. Hot Water Pump No.2 Start/Stop
18. Hot Water Pump No.2 Status
19. Hot Water Pump No.2 VFD Speed Setpoint
20. Hot Water Pump No.2 VFD Fault

B. Cafetorium Air Handling Unit, AHU-1

1. Disconnect all wiring and remove the existing air handling unit controls.
2. Provide and install one (1) Honeywell Direct Digital Controller configured to accommodate the required input/outputs.
3. Furnish and install temperature and humidity sensing devices.
4. Replace the existing hot water control valve and associated actuator.
5. Replace the existing damper actuators and associated actuators.
6. Extend signal wiring from direct digital controller to all sensing, control and monitored devices.
7. Program controller as required to perform the specified energy conservation sequence of operations.
8. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
9. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
10. Generate a 3-dimensional graphical representation of the air handling unit allowing building operators to monitor the equipment and adjust operating parameters.
11. Establish an air handling unit operating schedule consistent with the facilities occupancy profile.
12. Commission the controls to verify and document proper operation.

<u>Cafetorium AHU-1 Control/Monitoring Points:</u>

1. Outside Air Damper Modulation
2. Return Air Damper Modulation
3. Supply Fan Start/Stop
4. Supply Fan Status
5. Discharge Air Temperature
6. Hot Water Valve Modulation
7. Cafetorium Space Temperature
8. Cafetorium Space CO2 Level
9. Low Temperature Switch Status
10. Supply Air Smoke Detector Status
11. EF-6 Start/Stop
12. EF-6 Status
13. EF-7 Start/Stop
14. EF-7 Status

15. EF-8 Start/Stop
16. EF-8 Status
17. Kitchen Hood Exhaust Fan Status

C. Toilet Rooms Air Handling Unit, AHU-2

1. Disconnect all wiring and remove the existing air handling unit controls.
2. Provide and install one (1) Honeywell Direct Digital Controller configured to accommodate the required input/outputs.
3. Furnish and install temperature and humidity sensing devices.
4. Replace the existing hot water control valve and associated actuator.
5. Replace the existing damper actuators and associated actuators.
6. Extend signal wiring from direct digital controller to all sensing, control and monitored devices.
7. Program controller as required to perform the specified energy conservation sequence of operations.
8. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
9. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
10. Generate a 3-dimensional graphical representation of the air handling unit allowing building operators to monitor the equipment and adjust operating parameters.
11. Establish an air handling unit operating schedule consistent with the facilities occupancy profile.
12. Commission the controls to verify and document proper operation.

<u>Toilet Rooms AHU-2 Control/Monitoring Points:</u>

1. Outside Air Damper Actuation
2. Return Air Damper Actuation
3. Supply Fan Start/Stop
4. Supply Fan Status
5. Discharge Air Temperature
6. Hot Water Valve Modulation
7. Toilet Room Damper Actuation
8. Toilet Room Space Temperature
9. Low Temperature Switch Status
10. Supply Air Smoke Detector Status

D. Unit Ventilator with Exhaust Fan (Typical for 30)

1. Disconnect all wiring and replace the existing McQuay Micro Tech controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Replace the existing electronic damper actuator with model compatible with Honeywell Direct Digital Controller.
4. Program the Honeywell controller as required to mimic the existing sequence of operations.
5. Incorporate monitoring of the lighting occupancy sensor status. Program such that the unit ventilators daily schedule will be overridden based upon actual classroom occupancy.
6. Generate a 3-dimensional graphical representation of the unit ventilators allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a unit ventilator operating schedule consistent with the facilities occupancy profile.
8. Extend communication wiring as required to establish communication with the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
9. Commission the controls to verify and document proper operation.

Unit Ventilator with Exhaust Fan Control/Monitoring Points (Typical for 30):

1. Face and Bypass Damper Modulation
2. Unit Ventilator Hot Water Valve Actuation
3. Radiator Valve Actuation
4. Low Temperature Switch Status
5. Unit Ventilator Fan Start/Stop
6. Unit Ventilator Fan Status
7. Exhaust Fan Start/Stop
8. Exhaust Fan Status
9. Space Occupancy Sensor Status
10. Space Temperature

E. General Exhaust Fans: EF-1 through EF-5, EF-9 and EF-10

1. Provide and install combination current sensor / RIB relay on exhaust fan power wiring.
2. Extend signal wiring from nearest direct digital controller to all control and monitored devices.
3. Program controller as required to perform the specified energy conservation sequence of operations.
4. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
5. Generate a 3-dimensional graphical representation of the exhaust fan allowing building operators to monitor the equipment and adjust operating parameters.
6. Establish an exhaust fan operating schedule consistent with the facilities occupancy profile.
7. Commission the controls to verify and document proper operation.

General Exhaust Fan Control/Monitoring Points (Typical for 7):

1. Exhaust Fan Start/Stop
2. Exhaust Fan Status

F. 2001 Addition Boiler Room: Hot Water System, B-1, B-2, HWP-1, HWP-2

1. Disconnect all wiring and replace the existing Staefa controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program the Honeywell controller as required to perform the revised sequence of operations incorporating variable frequency drives on hot water pumps.
4. Extend signal wiring from direct digital controller to all new variable frequency drive sensing, control and monitored devices.
5. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
6. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
7. Generate a 3-dimensional graphical representation of the hot water system allowing building operators to monitor the equipment and adjust operating parameters.
8. Establish a hot water system operating schedule consistent with the facilities occupancy profile.
9. Commission the controls to verify and document proper operation.

2001 Addition Hot Water System Control/Monitoring Points:

1. Outside Air Temperature
2. Outside Air Relative Humidity
3. Boiler Management Enable
4. Boiler No.1 Status
5. Boiler No.1 Alarm
6. Boiler No.2 Status

7. Boiler No.2 Alarm
8. Hot Water Supply Temperature
9. Hot Water Return Temperature
10. Hot Water Pressure Bypass Control Valve
11. Hot Water System Differential Pressure
12. Hot Water Pump No.1 Start/Stop
13. Hot Water Pump No.1 Status
14. Hot Water Pump No.1 VFD Speed Setpoint
15. Hot Water Pump No.1 VFD Fault
16. Hot Water Pump No.2 Start/Stop
17. Hot Water Pump No.2 Status
18. Hot Water Pump No.2 VFD Speed Setpoint
19. Hot Water Pump No.2 VFD Fault
20. Combustion Air Damper Actuation
21. Combustion Air Damper Open Status
22. Mechanical Room 127 Space Temperature
23. Fire Alarm Shutdown

G. 2001 Addition Air Handling Units, Typical for AHU-1 through AHU-4

1. Disconnect all wiring and replace the existing Staefa controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program controller as required to perform the specified energy conservation sequence of operations.
4. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
5. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
6. Generate a 3-dimensional graphical representation of the air handling unit allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish an air handling unit operating schedule consistent with the facilities occupancy profile.
8. Commission the controls to verify and document proper operation.

<u>2001 Addition Air Handling Units Control/Monitoring Points (Typical for 4):</u>

1. Outside Air Damper Modulation
2. Return Air Damper Modulation
3. Relief Air Damper Modulation
4. Mixed Air Temperature
5. Filter DP Status
6. Face and Bypass Damper Modulation
7. Hot Water Valve Modulation
8. Low Temperature Switch Status
9. DX Cooling Stage No.1 Start/Stop
10. DX Cooling Stage No.2 Start/Stop (N/A for AHU-4)
11. Supply Fan Start/Stop
12. Supply Fan Status
13. Discharge Air Temperature
14. Supply Air Smoke Detector Status
15. Return Air Temperature
16. Return Fan Start/Stop
17. Return Fan Status
18. Space Served Temperature

19. Exhaust Fan EF-2 Start/Stop (AHU-4 only)
20. Exhaust Fan EF-2 Status (AHU-4 only)

H. 2001 Addition Rooftop Unit, RTU-1

1. Disconnect all wiring and replace the existing Staefa controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program controller as required to perform the specified energy conservation sequence of operations.
4. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
5. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
6. Generate a 3-dimensional graphical representation of the rooftop unit allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a rooftop unit operating schedule consistent with the facilities occupancy profile.
8. Commission the controls to verify and document proper operation.

<u>2001 Addition Rooftop Unit Control/Monitoring Points:</u>

1. Outside / Return Air Damper Modulation
2. Filter DP Status
3. DX Cooling Stage No.1 Start/Stop
4. Supply Fan Start/Stop
5. Supply Fan Status
6. Low Temperature Switch Status
7. Supply Air Smoke Detector Status
8. Hot Water Valve Modulation
9. Discharge Air Temperature
10. Space Served Temperature

I. 2001 Addition Classroom Air Conditioning Units (Typical for 14)

1. Disconnect all wiring and replace the existing Staefa controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program the Honeywell controller as required to mimic the existing sequence of operations.
4. Incorporate monitoring of the lighting occupancy sensor status. Program such that the classroom air conditioning unit's daily schedule will be overridden based upon actual classroom occupancy.
5. Generate a 3-dimensional graphical representation of the classroom air conditioning units allowing building operators to monitor the equipment and adjust operating parameters.
6. Establish a classroom air conditioning unit operating schedule consistent with the facilities occupancy profile.
7. Extend communication wiring as required to establish communication with the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
8. Commission the controls to verify and document proper operation.

<u>Classroom Air Conditioning Unit Control/Monitoring Points (Typical for 14):</u>

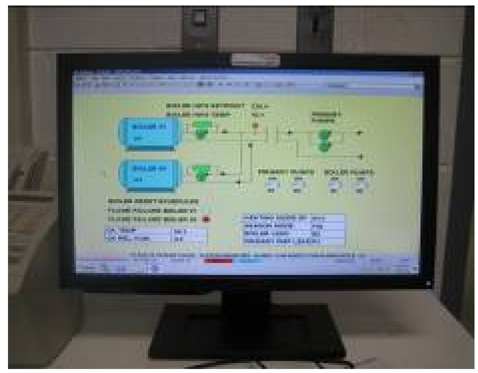
1. Outside Air Damper Modulation
2. Supply Fan Start/Stop
3. Supply Fan Status
4. Compressor Start/Stop

5. Compressor Status
6. Condenser Fan Status
7. Discharge Air Temperature
8. Low Temperature Switch Status
9. Hot Water Valve Modulation
10. Space Occupancy Status
11. Space Temperature

Pond Middle School

Existing Condition

There are multiple temperature control systems in the Pond Road Middle School including a Honeywell Enterprise Buildings Integrator (EBI) System upgraded in 2011, original Honeywell MicroCel/MacroCel and pneumatic system, a Honeywell Light Commercial Building Systems (LCBS) serving the 2003 C, E and G Wing Additions and a Delta Control System serving part of the 2003 G Wing Addition. Each system operates independently, which may result in competing mechanical systems and excessive energy consumption.



Recently Upgraded Honeywell Enterprise Buildings Integrator Workstation

Proposed Condition

Upgrade the MicroCel/MacroCel and pneumatic controls, which are at the end of their useful life to the latest Honeywell controller technology and incorporate them into the recently upgraded Honeywell Enterprise Buildings Integrator (EBI) System. Replace the existing pocket of Delta controls in the G-wing with Honeywell controllers incorporated into the existing Honeywell LCBS system. Integrate the Honeywell LCBS system serving the C, E and G Wings into the recently installed Honeywell Enterprise Buildings Integrator (EBI) System.

Scope of Work

A. Boiler Room - Hot Water System

1. Disconnect all wiring and replace the existing Honeywell Excel Plus controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program controller as required to perform the specified energy conservation sequence of operations.
4. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
5. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
6. Map new control points to the existing EBI graphical representation of the hot water system allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a hot water system operating schedule consistent with the facilities occupancy profile.
8. Commission the controls to verify and document proper operation.

Hot Water System Control/Monitoring Points:

1. OA Temperature
2. OA Relative Humidity
3. Boiler No.1 Enable

4. Boiler No.1 Flame Failure
5. Boiler No.2 Enable
6. Boiler No.2 Flame Failure
7. Boiler HW Pump No.1 Start/Stop
8. Boiler HW Pump No.1 Status
9. Boiler HW Pump No.2 Start/Stop
10. Boiler HW Pump No.2 Status
11. Hot Water Supply Temperature
12. Hot Water Return Temperature
13. Building Fire Alarm Signal Status
14. Exhaust Fan EF-B-2 Status
15. Primary HW Pump No.1 Start/Stop
16. Primary HW Pump No.1 Status
17. Primary HW Pump No.2 Start/Stop
18. Primary HW Pump No.2 Status

B. Air Handling Units, AH-A-1, AH-A-2, AH-B-1 through AH-B-6, AH-C-1 through AH-C-5, AH-D-1, AH-D-1A through AH-D-9, AHU-1 and AHU-2

1. Disconnect all wiring and replace the existing Honeywell MacroCel/MicroCel controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program controller as required to perform the specified energy conservation sequence of operations.
4. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
5. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
6. Map new control points to the existing EBI graphical representation of the air handling unit allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish an air handling unit operating schedule consistent with the facilities occupancy profile.
8. Commission the controls to verify and document proper operation.

<u>Air Handling Unit Control/Monitoring Points (Typical for 25):</u>

1. Outside / Return / Relief Air Damper Modulation
2. Filter DP Status
3. Mixed Air Temperature
4. DX Cooling Stage No.1 Start/Stop
5. Supply Fan Start/Stop
6. Supply Fan Status
7. Discharge Air Temperature
8. Supply Air Smoke Detector Status
9. Space Temperature
10. Return Air Temperature
11. Return Air Relative Humidity
12. EF-1 Start/Stop (AHU-1 only)
13. EF-1 Status (AHU-1 only)
14. EF-3 Start/Stop (AHU-1 only)
15. EF-3 Status (AHU-1 only)
16. EF-C-6 Start/Stop (AHU-2 only)
17. EF-C-6 Status (AHU-2 only)

C. Rooftop Units, RTU-1 through RTU-7

1. Disconnect all wiring and replace the existing Honeywell MacroCel controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program controller as required to perform the specified energy conservation sequence of operations.
4. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
5. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
6. Map new control points to the existing EBI graphical representation of the rooftop unit allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a rooftop unit operating schedule consistent with the facilities occupancy profile.
8. Commission the controls to verify and document proper operation.

Rooftop Unit Control/Monitoring Points (Typical for 7):

1. OA Temperature (RTU-1 only)
2. OA Relative Humidity (RTU-1 only)
3. Outside / Return Air Damper Modulation
4. Filter DP Status
5. Mixed Air Temperature
6. DX Cooling Stage No.1 Start/Stop
7. Supply Fan Start/Stop
8. Supply Fan Status
9. Discharge Air Temperature
10. Supply Air Smoke Detector Status (excluded for RTU-1)
11. Return Air Temperature
12. Return Air Relative Humidity
13. EF-A-1 Start/Stop (RTU-3 & RTU-4 only)
14. EF-A-1 Status (RTU-3 & RTU-4 only)
15. EF-A-2 Start/Stop (RTU-5 & RTU-6 only)
16. EF-A-2 Status (RTU-5 & RTU-6 only)
17. EF-A-3 Start/Stop (RTU-1 & RTU-2 only)
18. EF-A-3 Status (RTU-1 & RTU-2 only)
19. EF-4 Start/Stop (RTU-7 only)
20. EF-4 Status (RTU-7 only)

D. Heating and Ventilation Units, HV-B-1, HV-E-1 through HV-E-4

1. Disconnect all wiring and replace the existing Honeywell MacroCel/MicroCel controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program controller as required to perform the specified energy conservation sequence of operations.
4. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
5. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
6. Map new control points to the existing EBI graphical representation of the H&V unit allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish an H&V unit operating schedule consistent with the facilities occupancy profile.
8. Commission the controls to verify and document proper operation.

Heating and Ventilation Control/Monitoring Points (Typical for 5):

1. Outside / Return Air Damper Modulation
2. Filter DP Status
3. Heating Coil Valve Modulation
4. Low Temperature Switch Status
5. Supply Fan Start/Stop
6. Supply Fan Status
7. Discharge Air Temperature
8. Space Temperature
9. Return Air Humidity

E. Fan Coil Units (Typical for 13)

1. Disconnect all wiring and replace the existing controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Replace the existing pneumatic valve actuator with the comparable electronic actuator. Valve body to remain.
4. Program the Honeywell controller as required to mimic the existing sequence of operations.
5. Incorporate monitoring of the lighting occupancy sensor status. Program such that the reheat coil daily schedule will be overridden based upon actual room occupancy.
6. Generate a 3-dimensional graphical representation of the fan coil unit allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a fan coil unit operating schedule consistent with the facilities occupancy profile.
8. Extend communication wiring as required to establish communication with the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
9. Commission the controls to verify and document proper operation.

Fan Coil Unit Control/Monitoring Points (Typical for 13):

1. Fan Start/Stop
2. Heating Valve Modulation
3. Discharge Temperature
4. Space Occupancy Sensor Status
5. Space Temperature

F. Fan Powered VAV (Typical for 9)

1. Disconnect all wiring and replace the existing controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Replace the existing pneumatic valve and damper actuators with the comparable electronic actuator. Valve body to remain.
4. Program the Honeywell controller as required to mimic the existing sequence of operations.
5. Incorporate monitoring of the lighting occupancy sensor status. Program such that the VAV daily schedule will be overridden based upon actual room occupancy.
6. Generate a 3-dimensional graphical representation of the VAV allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a VAV operating schedule consistent with the facilities occupancy profile.
8. Extend communication wiring as required to establish communication with the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
9. Commission the controls to verify and document proper operation.

Fan Powered VAV Control/Monitoring Points (Typical for 9):

1. Fan Start/Stop
2. Heating Valve Modulation
3. Damper Modulation
4. Supply Air Flow
5. Discharge Temperature
6. Space Occupancy Sensor Status
7. Space Temperature

G. Unit Ventilator with Exhaust Fan (Typical for 5)

1. Disconnect all wiring and replace the existing controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Replace the existing electronic valve and damper actuators with model compatible with Honeywell Direct Digital Controller.
4. Program the Honeywell controller as required to mimic the existing sequence of operations.
5. Incorporate monitoring of the lighting occupancy sensor status. Program such that the unit ventilators daily schedule will be overridden based upon actual classroom occupancy.
6. Generate a 3-dimensional graphical representation of the unit ventilators allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a unit ventilator operating schedule consistent with the facilities occupancy profile.
8. Extend communication wiring as required to establish communication with the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
9. Commission the controls to verify and document proper operation.

Unit Ventilator with Exhaust Fan Control/Monitoring Points (Typical for 5):

1. Face and Bypass Damper Modulation
2. Unit Ventilator Hot Water Valve Actuation
3. Radiator Valve Actuation
4. Low Temperature Switch Status
5. Unit Ventilator Fan Start/Stop
6. Unit Ventilator Fan Status
7. Space Occupancy Sensor Status
8. Space Temperature

H. Reheat Coils (Typical for 25)

1. Disconnect all wiring and replace the existing Honeywell MicroCel controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Replace the existing pneumatic valve actuator with the comparable electronic actuator. Valve body to remain.
4. Program the Honeywell controller as required to mimic the existing sequence of operations.
5. Incorporate monitoring of the lighting occupancy sensor status. Program such that the reheat coil daily schedule will be overridden based upon actual classroom occupancy.
6. Map new control points to the existing EBI graphical representation of the reheat coil allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a reheat coil setpoint operating schedule consistent with the facilities occupancy profile.
8. Extend communication wiring as required to establish communication with the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
9. Commission the controls to verify and document proper operation.

Reheat Coil Control/Monitoring Points (Typical for 25):
1. Reheat Valve Modulation
2. Discharge Temperature
3. Low Temperature Switch Status
4. Space Occupancy Sensor Status
5. Space Temperature

I. Exhaust Fans
1. Disconnect all wiring and replace the existing controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Program the Honeywell controller as required to mimic the existing sequence of operations.
3. Map new control points to the existing EBI graphical representation of the exhaust fan allowing building operators to monitor the equipment and adjust operating parameters.
4. Establish an exhaust fan operating schedule consistent with the facilities occupancy profile.
5. Extend communication wiring as required to establish communication with the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
6. Commission the controls to verify and document proper operation.

Exhaust Fan Control/Monitoring Points:
1. Zone A1 Fan Start/Stop
2. Zone A2 Fan Start/Stop
3. Zone A3 Fan Start/Stop
4. Zone B1 Fan Start/Stop
5. Zone B2 Fan Start/Stop
6. Zone B3 Fan Start/Stop
7. Zone B4 Fan Start/Stop
8. Zone C1 Fan Start/Stop
9. Zone D1 Fan Start/Stop
10. Zone E1 Fan Start/Stop
11. EF-A-1 Fan Status
12. EF-A-2 Fan Status
13. EF-A-3 Fan Status
14. EF-A-4 Fan Status
15. EF-A-5 Fan Status
16. EF-A-6 Fan Status
17. EF-A-7 Fan Status
18. EF-A-8 Fan Status
19. EF-B-1 Fan Status
20. EF-B-2 Fan Status
21. EF-B-3 Fan Status
22. EF-B-4 Fan Status
23. EF-B-5 Fan Status
24. EF-B-6 Fan Status
25. EF-B-7 Fan Status
26. EF-B-8 Fan Status
27. EF-B-9 Fan Status
28. EF-B-10 Fan Status
29. EF-B-11 Fan Status
30. EF-C-1 Fan Status
31. EF-C-2 Fan Status

32. EF-C-3 Fan Status
33. EF-C-4 Fan Status
34. EF-C-5 Fan Status
35. EF-C-6 Fan Status
36. EF-C-7 Fan Status
37. EF-C-8 Fan Status
38. EF-C-9 Fan Status
39. EF-D-1 Fan Status
40. EF-D-2 Fan Status
41. EF-D-3 Fan Status
42. EF-D-4 Fan Status
43. EF-D-5 Fan Status
44. EF-D-6 Fan Status
45. EF-D-7 Fan Status
46. EF-D-8 Fan Status
47. EF-D-9 Fan Status
48. EF-D-10 Fan Status
49. EF-D-11 Fan Status
50. EF-D-12 Fan Status
51. EF-E-1 Fan Status
52. EF-E-2 Fan Status
53. EF-E-3 Fan Status
54. EF-E-4 Fan Status
55. EF-E-5 Fan Status
56. EF-E-6 Fan Status

J. C, E and G Wing R2 JACE

1. Obtain Tridium R2 JACE License from factory and upload controller.
2. Disconnect all wiring and replace the existing Tridium R2 JACE Controller with a new Honeywell AX JACE Controller.
3. Perform LONworks discovery of all existing Honeywell Excel 15 and Excel 10 control points and programs.
4. Establish communication between the new Honeywell AX JACE controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.

K. G-Wing Delta Rooftop Unit, RTU-D-1

1. Disconnect all wiring and replace the existing Delta controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program controller as required to perform the specified energy conservation sequence of operations.
4. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
5. Incorporate the new control and monitoring points into the existing Robbinsville EBI database.
6. Generate a 3-dimensional graphical representation of the rooftop unit allowing building operators to monitor the equipment and adjust operating parameters.
7. Establish a rooftop unit operating schedule consistent with the facilities occupancy profile.
8. Commission the controls to verify and document proper operation.

<u>Rooftop Unit, RTU-D-1 Control/Monitoring Points:</u>

1. Mixing Box Static Pressure
2. Outside Air Damper Modulation
3. Return Air Damper Modulation

4. Relief Air Damper Modulation
5. Mixed Air Temperature
6. Pre-Filter DP Status
7. Filter DP Status
8. Face and Bypass Damper Modulation
9. Freeze Protection Pump Start/Stop
10. DX Stage 1 Start/Stop
11. DX Stage 2 Start/Stop
12. Supply Fan VFD Start/Stop
13. Supply Fan VFD Speed
14. Supply Fan VFD Status
15. High Static Pressure Switch Status
16. Discharge Air Temperature
17. Supply Air Smoke Detector Status
18. Supply Air Duct Static Pressure
19. Return Air Temperature
20. Return Air Relative Humidity
21. Return Air CO2 Level

L. G-Wing Delta Fan Powered VAV: VAV-D-5 through VAV-D-10

1. Disconnect all wiring and replace the existing Delta controller with the latest Honeywell Direct Digital Controller configured to accommodate the required input/outputs. Reconnect wiring.
2. Replace the existing temperature sensors with models compatible with Honeywell Direct Digital Controller.
3. Program the Honeywell controller as required to mimic the existing sequence of operations.
4. Incorporate monitoring of the lighting occupancy sensor status. Program such that the VAV daily schedule will be overridden based upon actual room occupancy.
5. Generate a 3-dimensional graphical representation of the VAV allowing building operators to monitor the equipment and adjust operating parameters.
6. Establish a VAV operating schedule consistent with the facilities occupancy profile.
7. Establish communication between the direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
8. Commission the controls to verify and document proper operation.

Fan Powered VAV Control/Monitoring Points (Typical for 6):

1. Fan Start/Stop
2. Heating Valve Modulation
3. Damper Modulation
4. Supply Air Flow
5. Discharge Temperature
6. Space Occupancy Sensor Status
7. Space Temperature

M. Existing Honeywell Excel 10 C, E and G-Wing Fan Powered VAVs: VAV-C-1 through VAV-C-12, VAV-D-1 through VAV-D-4 and VAV-E-1 through VAV-E-13

1. Incorporate monitoring of the lighting occupancy sensor status into the existing Honeywell Excel 10 direct digital controller. Program such that the VAV daily schedule will be overridden based upon actual room occupancy.
2. Integrate the VAV JACE BacNet points into the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
3. Generate a 3-dimensional graphical representation of the VAV allowing building operators to monitor the equipment and adjust operating parameters.

4. Establish a VAV operating schedule consistent with the facilities occupancy profile.
5. Establish communication between the existing direct digital controller and the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
6. Commission the controls to verify and document proper operation.

Fan Powered VAV Control/Monitoring Points (Typical for 29):

1. Fan Start/Stop
2. Heating Valve Modulation
3. Damper Modulation
4. Supply Air Flow
5. Discharge Temperature
6. Space Occupancy Sensor Status
7. Space Temperature

N. Existing Honeywell Excel 15 Rooftop Units: RTU-C-1, RTU-C-2, RTU-C-3, RTU-D-2, RTU-D-3, RTU-E-1, RTU-E-2, RTU-E-3

1. Integrate the rooftop JACE BacNet points into the Honeywell Enterprise Buildings Integrator Server via the Robbinsville School District's IT network.
2. Generate a 3-dimensional graphical representation of the rooftop units allowing building operators to monitor the equipment and adjust operating parameters.
3. Establish a rooftop unit operating schedule consistent with the facilities occupancy profile.
4. Commission the controls to verify and document proper operation.

Excel 15 Rooftop Unit Control/Monitoring Points (Typical for 8):

1. Mixing Box Static Pressure
2. Outside Air Damper Modulation
3. Return Air Damper Modulation
4. Relief Air Damper Modulation
5. Mixed Air Temperature
6. Pre-Filter DP Status
7. Filter DP Status
8. Face and Bypass Damper Modulation
9. Freeze Protection Pump Start/Stop
10. DX Stage 1 Start/Stop
11. DX Stage 2 Start/Stop
12. Supply Fan VFD Start/Stop
13. Supply Fan VFD Speed
14. Supply Fan VFD Status
15. High Static Pressure Switch Status
16. Discharge Air Temperature
17. Supply Air Smoke Detector Status
18. Supply Air Duct Static Pressure
19. Return Air Temperature
20. Return Air Relative Humidity
21. Return Air CO2 Level

Robbinsville High School

Existing Condition
A Delta Control system, which performs automatic temperature control of the facility, was installed in 2005 during the original construction of Robbinsville High School. The system is equipped with a Graphical User Interface to allowing operators to monitor equipment, adjust control parameters and to modify operating schedules.

Minor deficiencies with the Delta Control system were observed including the failure of a cooling tower fan's variable frequency drive and cooling tower sump bypass valve.

Proposed Condition
Repair the cooling tower controls as required. Optimize primary mechanical system control algorithms and schedules where possible.

Scope of Work

A. Condenser Water Loop: CT-1 Fan and CT-2 Fan
1. Disconnect power and control wiring from existing failed condenser water pump VFD. Replace with new VFD and reconnect power and control wiring.
2. Repair / replace cooling tower 12" basin bypass valve. Re-establish control and tune control parameters.

B. Hot, Chilled and Condenser Water Pumps
1. Establish automated start/stop control of hot, chilled and condenser water pumps.
2. Modify exisitng control system programming as nessecary to establish automated speed control of the hot and chilled pumps water through the use of the existing variable frequency drives. Pump speed shall be varied in order to maintain differential pressure setpoint.
3. Implement a Central Plant (Heating and Cooling) operating schedule consistent with the facilities occupancy profile.

C. Winter Free Cooling: CT-1, CT-2 & PHX-1
1. Modify existing central utility plant programming to automate switchover from mechanical cooling to free cooling upon sensing the appropriate outdoor air conditions.

D. System Review
1. Review building operating schedules to ensure equipment run-times are consistent with facility occupancy profile. Adjust as necessary.
2. Review and verify occupied and unoccupied space temperature setpoints are within normal operating standards. Adjust as necessary.

Windsor Elementary School

Existing Conditions
The Windsor Elementary School boiler is controlled by a local Honeywell thermostat located in the hallway on the first floor. Individual steam radiators with manual steam control valves provide heat to the classrooms and hallways.

Existing Steam Radiator in Windsor Elementary School

Proposed State
Upgrade the existing local thermostat controlling the Boiler. Install self-contained thermostatic radiator valves on each of the existing radiators to prevent overheating.

Scope of Work

A. Steam Boiler, B-1
1. Replace the existing programmable thermostat with a 7-day programmable thermostat.

B. Steam Radiators (Typical for 11)
1. Remove existing manual steam valve at each radiator and replace with a thermostatic 90deg. steam control valve.

Energy Savings Methodology and Results
The energy savings for this ECM is realized at the buildings' HVAC equipment due to better control of the HVAC system, night set-back and set-up temperatures, start/stop etc.

Customer Support and Coordination with Utilities
Minor support will be required for the interruption of utilities for brief tie-in periods.

Environmental Issues

Resource Use	Energy savings will result from reduced electric energy usage and better occupant comfort.
Waste Production	This measure will produce no waste by-products.
Environmental Regulations	No environmental impact is expected.

ECM 3B
Demand Control Ventilation

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
3B	Demand Control Ventilation	✓	✓	✓	

Existing System:
The roof top and air handling units serving large one zone spaces such as auditoriums, gymnasiums and cafeterias are often designed for peak occupancy conditions to supply outside air to the space with return air from space being exhausted. Most of the time these spaces are not fully occupied, which increase energy demand for heating and cooling of excessive amount of outside air.

Pond Road MS Gymnasium AHU

Robbinsville HS Gymnasium AHU

Proposed Scope:
Honeywell will install CO_2 sensors at the Robbinsville Public School District gymnasiums, auditoriums and cafeterias (see table below for the locations). The CO_2 sensor will provide the control signal for the air handlers to optimize the quantity of fresh air that is required.. The installation of a CO_2 sensor will read the levels of CO_2 in the space and ensure that only the required outside air is supplied and heated to meet the minimum outdoor air requirements. This control strategy will reduce amount of outside air intake and thus reduce the heating energy used by the air handling units and electric energy used by the motors. Based on this fact, there is a reduced requirement for outside air to this space.

School	Area Served	No. of Units	Motor HP Supply/Exhaust Total	CFM Total
Robbinsville HS	Main Gym	1	15	11,500
Robbinsville HS	Aux. Gym	1	15	11,500
Robbinsville HS	Auditorium	1	20	17,800
Robbinsville HS	Upper Auditorium	1	2	2,500
Pond Road MS	Main Gym	2	5	3,000
Sharon ES	2001 Gym	2	3	3,050

Table 3B.1 – Existing AHUs to be Installed with CO_2 sensors

Energy Savings Methodology and Results

The savings approach is based upon reducing the amount of energy that needs to pre-heat or cool the outside air. The savings are generally calculated as:

Existing Heating BTU & Cost per BTU	= Metered Data from Existing meter readings
Cost of Existing Heating	= Average Site Data $/CCF or $/Gallon
Reduction in Heating/Cooling BTU	= Reduction in Outside air cfm x 1.08 x Delta T x Hours the fan is = Existing BTU x Cost per BTU
Cost of Proposed Heating/Cooling	= Existing Heating Costs – Proposed Heating Costs
Energy Savings $	

The baseline adjustment calculations are included with the energy calculations.

Changes in Infrastructure

None.

Customer Support and Coordination with Utilities

Minor support will be required for the interruption of utilities for brief tie-in periods.

Environmental Issues

Resource Use	Energy savings will result from reduced energy.
Waste Production	Any removed parts will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 4A
Building Envelope Improvements

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
4A	Building Envelope Improvements	✓	✓	✓	✓

Existing Conditions
The building was inspected visually and using smoke tracer tests in accordance with ASTM E-1186 – 03. A smoke puffer was used to identify the location and severity of air leakage paths. These air leakage paths are detailed in the scope of work below. Areas inspected include: roof-wall joints, elevation changes, soffit areas, roofs, walls, windows, doors and other penetrations.

While it is never economically feasible to address all the penetrations in a building envelope, we estimate that we can address the equivalent of an 89.62 square foot hole in total across the buildings studied at a reasonable cost and having a significant impact on future energy consumption. Placing this measure in perspective for comparison purposes, take an average single entrance door (3'x7') having an area of 21 square feet. The total cumulative "Hole Size" of 89.62 square feet would be equivalent to having almost 4.5 single entrance doors wide open, 24 hours a day, 365 days a year (representing gaps, cracks and holes in buildings).

Pond Road MS

Robbinsville HS

Significant Issues – Overview
Building envelope inspections were performed on four (4) buildings located at Robbinsville School District in Robbinsville, NJ. Overall, three of the buildings are in good condition and very well maintained. The Windsor Elementary School is in fair condition, due to the considerable age of the structure, but still well maintained. During our inspection we found that the buildings are a mix of fairly to moderately leaky.

The oldest building, built in 1909, has had no additions added, but has had newer energy efficient window systems installed throughout. The High School is very new, with construction completed in 2005. The Pond Road Middle School had three (3) additions (wings) added in 2004. And the Sharon Elementary School, built in 1957, has had additions added in 1965, 1991 and 2001. These buildings represented a cross-section of construction styles and ages, which include:

- Steel-frame and CMU walls with flat metal roofing
- Masonry and brick walls with a combination of steel-framed and wood-framed pitched and/or flat roofing
- One and two story sections, with auditoriums, cafeterias, and media centers
- Older structures, with construction dates from 1909 & 1957 to new structures, constructed in 1996 and 2005

Our building envelope assessments identified several significant air leakage paths in a majority of the buildings we inspected, with the key leakage areas being:

- Roof-wall joints,
- Exterior and roof-access doors,
- Window systems,
- Exterior walls open to vented soffit systems,
- HVAC distribution chases, roof fans and skylights that connect the unconditioned mechanical rooms and outdoors directly to the conditioned spaces within the building envelopes.

The majority of the air leakage paths identified during our building assessments are a direct result of misalignment of the building's thermal and air barriers that resulted from design issues, implementation issues during construction and/or maintenance activities, or age-deterioration of materials.

Discussions with staff revealed the following issues:

- Major comfort issues/complaints
- Considerable ongoing moisture/humidity issues, and inability to evenly heat/cool the buildings
- High level of maintenance, associated with poor quality of exterior sealants and weatherstripping

These air leakage defects are leading to ongoing comfort and IAQ (indoor air quality) complaints/concerns, moisture and insect intrusion, deterioration of interior finish materials (suspended ceiling tiles, sheet rock ceilings/walls, and stored items such as paper and/or boxed items kept in store rooms or delivery rooms).

Sealing these air leakage pathways can considerably reduce the energy usage of these buildings, improve structural integrity (by stopping the intrusion of moisture, which can cause a significant amount of deterioration to the various construction materials/systems) and can greatly improve the comfort and indoor air quality of the building occupants. For example, sealing the extensive amount of leaky roof-wall junctures and wall openings to vented soffits will considerably reduce the intrusion of hot, moist air during the cooling season and shoulder months, which will greatly improve the ability of the air-conditioning equipment to keep the classrooms and office areas conditioned (cool & dry), improving the comfort of the occupants and minimizing the inadvertent sabotage caused by occupants (teachers/office staff) opening windows while air-conditioning systems are running.

During the course of our assessments we also identified a few building issues that are not directly related to the tightness or performance of the building air-barrier systems, but need to be referenced, so that any relevant follow-up tasks might be performed. These include:

Pond Road Middle School: Considerable amounts of deterioration and staining along the masonry walls on the higher sections of the building, along building junctures to the lower sections, specifically at the transitions of the rubber membranes and flashing, potentially caused by weep holes being blocked and/or covered and not allowing the masonry wall systems to drain properly. Consideration should be given toward having the existing weep-hole systems inspected along the various building junctures to identify the potential cause(s) of this condition, and minimize further/ongoing deterioration.

Sharon Elementary School: A significant amount of the exterior sealants, (e.g. mortar, grout, etc.) along the brick and masonry surfaces is extremely dry and cracking (alligator-like), specifically in corners, at building junctures and edges along door and window framing systems. The age-deteriorated sealants can allow a substantial amount of bulk water and moisture to penetrate the exterior wall surfaces, causing heaving in the colder months, and deterioration of the brick and masonry systems. We highly recommend that consideration be given toward having a detailed inspection of the brick and masonry sealants be performed, to determine the extent and severity of this condition.

Significant Issues – By Building

Robbinsville High School

Construction was completed on the new High School building in 2005. The structure is a 2-story building, with higher roof sections in the auditorium and gymnasiums. The building is constructed with steel-framed masonry walls, with flat, steel-framed metal roof decks. The roof decks have rubber membranes and are insulated (approximately R-19).

Overall, the building is in very good condition, well maintained and reasonably tight.
The exterior and mechanical room doors were tested using tracer smoke equipment. Each of the exterior and mechanical room doors tested leaky and need new weatherstripping installed (this includes the interior mechanical room doors, which open to the various corridors). The roll-up overhead door was inspected and tested leaky along the top edge and a new, effective weatherstrip material needs to be installed.

The window systems in the building are aluminum-framed, double-pane, insulated systems, with a mix of fixed and operable sections. The window systems were inspected and tested using tracer smoke and ultrasound equipment. The window systems tested tight along all glazing, framing and sashes.
There are four (4) large skylights installed along the central corridor (northeast to southwest) which connect directly to the conditioned spaces below. The skylights have deteriorated exterior sealants, which need to be removed and new appropriate non-foam sealants need to be installed.

The roof-wall junctures were inspected and tested tight along all accessible sections of the building. There are a large number of roof top fans installed that also connect directly to the conditioned spaces below. These units need to be inspected and sealed using an appropriate non-foam sealant.

Pond Road Middle School

The original section of the Middle School was built in 1993, with additions added in 2004 using similar construction design. The structure is constructed with steel-framed masonry walls, and steel-framed sloped metal roof decks. The majority of the building is 1-story, with higher roof sections at the gym, cafeteria, media center and tech center. A separate roof-replacement project is being planned. In general, the building is in fair condition and well maintained. However, the building is fairly leaky along the building envelope, mostly attributed to construction design issues and age-deterioration of sealant and weatherstrip materials over time.

The exterior and mechanical room doors were inspected and tested using tracer smoke and ultrasound equipment. Each of the door units is leaky and needs new weatherstripping installed. The overhead door was also inspected and tested leaky along all 4 edges. New effective weatherstrip materials need to be installed.

The window systems in the building are aluminum-framed, double-pane units, with a mix of fixed and hopper-type sections. The windows were inspected and tested using tracer smoke and ultrasound equipment. The window units tested tight along framing, glazing and sashes.

There are a number of skylights installed that directly connect to the conditioned areas below. The exterior sealants along the glazing-frame seams is dried, cracking, and deteriorated and needs to be replaced using an appropriate glazing sealant material.

The roof-wall junctures throughout the building are leaky and need to be sealed. This includes the gym, cafeteria, and media and tech center sections. The roof-wall joints need to be sealed using 2-component, closed-cell, polyurethane spray foam.

Lastly, there are a large number of roof top fans which directly connect to the conditioned spaces below as well. The fans need to be inspected and sealed, using appropriate techniques and sealant materials.

Sharon Elementary School

The original section of Sharon Elementary School was built in 1957, with additions added in 1965, 1991 and 2001. The building has 1-story and 2-story sections, and the majority of the building is constructed with steel-framed, masonry walls and steel-framed, metal roof decks. A few sections have pitched metal roof decks and the original section has a wood-framed deck. The majority of the roofing has an EPDM (ethylene propylene diene monomer) membrane, with varying amounts of insulation. The pitched sections have asphalt shingle. A roof replacement is planned by the district under a separate project.

In general, the building is in fair-to-good condition, based on age of various sections, and is well maintained. However, there is some evidence of age-deterioration of building systems in the original section and the older additions. Several areas along the exterior brick walls show significant signs of age deterioration, specifically the grout and mortar at corners, building junctures and at the masonry framing of doors & windows. Consideration should be given toward having a detailed inspection of the exterior wall surfaces performed. Overall, the building is relatively leaky, due in part to construction and design details and age-deterioration of weatherstrip and sealants along the exterior penetrations.

The exterior doors in the building were inspected and tested, using tracer smoke and ultrasound equipment. Each of the doors tested leaky along 1 or more edges and new weatherstripping needs to be installed. The overhead doors were inspected and tested leaky along all 4 sides. New, effective weatherstripping needs to be installed.

The window systems installed in the building are metal-frame, double-pane insulated units, with a mix of fixed, awning and hopper-type sections. The window systems were tested using tracer smoke and ultrasound equipment, and tested tight along the glazing, framing and sashes. In the newer sections of the building, the sidelights and transoms are 2-pane units. However, there are several single-pane sidelights and transom sections installed along a few of the entry door systems that show significant signs of age-deterioration and are leaky along the frame-wall junctures. Consideration should be given toward replacing these old single-pane units with new Energy Star rated double-pane, insulated units.

The roof-wall junctures were tested throughout the structure, using tracer smoke and ultrasound equipment. All of the roof-wall junctures are leaky and need to be sealed using 2-component, closed-cell, polyurethane spray foam. In the original section of the building, the exterior walls have large openings to the vented soffits and are very leaky. These sections need to be sealed using Thermax and 2-component, closed-cell, polyurethane spray foam.

In the original section and each of the earlier additions, PTAC (packaged terminal air conditioner) units were utilized to condition the spaces. Prior to the newest addition being built (2001), all of the heating equipment was moved above the ceilings. However, the make-up air vents/grilles associated with the PTAC units, which are installed through the exterior walls, were not effectively sealed. They appear to be a major source of air leakage through the building envelope and of ongoing comfort complaints by occupants (staff, workers & students). These vents need to be effectively sealed shut, using appropriate sealant materials (e.g. Thermax and 2-component, closed-cell polyurethane spray foam). Additonally, there are several thru-the-wall air-conditioning units installed which are leaky along the housing-frame junctures and need to be sealed, using an appropriate non-foam sealant material.

Lastly, there are a large number of roof top fans installed that connect directly with the conditioned areas below. These fan units need to be inspected and sealed using appropriate techniques and sealant materials.

Windsor Elementary School

The Windsor Elementary School was built in 1909, and constructed with steel framing, brick masonry walls and a wood-framed, sloped, wood roof deck. The building is a 2-story structure with a partially finished basement (utilized as an office area and storage) and an insulated attic floor (fiberglass batts, approximately R-24). In general, considering the age of the building, it is in fair condition and fairly well maintained. Overall, the building is moderately leaky.

The exterior doors in the building were inspected and tested leaky using tracer smoke. New weatherstrip materials need to be installed. There are two (2) old, Bilco-type storm door systems in the rear that are in deteriorated condition, allowing a significant amount of air and moisture leakage through the building envelope. Consideration should be given to replacing these units with new insulated Bilco-type doors. Consideration should also be given toward replacing the large, steel vault-like mechanical room door (with counter weight) as the door framing is damaged and the door cannot be effectively closed completely or weatherstripped effectively.

This allows the mechanical room to communicate directly with the conditioned spaces directly outside the room (e.g. potential for flue gases, moisture, etc. to enter the conditioned, occupied space). The existing attic hatch and framing is deteriorated and a repair needs to be made to the framing to accommodate a new hatch door/panel. The new door needs to have 4" Thermax insulation affixed to attic side and the door needs to be weatherstripped.

There are newer, metal-framed, double-pane insulated window systems installed throughout the building. The majority of the windows tested tight along the glazing, framing and sashes. A few are leaky along the frame-wall seams and need to be sealed using an appropriate non-foam sealant. There are several thru-the-wall air-conditioning units installed that are leaky along the housing-to-wall seams and need to be sealed using an appropriate non-foam sealant. One of the A/C units is mounted in the framing of an old fan coil unit, which is mounted through the exterior wall. The unit's framing is also leaky along the frame-wall junctures and also needs to be sealed, using an appropriate non-foam sealant.

Additionally, there is an old coal delivery chute in place, with 2 oil pipes passing through to the exterior. The opening of the chute needs to be sealed with 2" Thermax, with the pipe penetrations and seams sealed with 2-component, closed-cell, polyurethane spray foam

Lastly, there are several penetrations in the attic floor that need to be sealed using appropriate sealant materials (e.g. Thermax, mastic, 2-component, closed-cell polyurethane spray foam, etc.)

DETAILED SCOPE OF WORK

Robbinsville High School

Construction was completed on the new High School building in 2005. The structure is a 2-story building, with higher roof sections in the auditorium and gymnasiums. The building is constructed with steel-framed masonry walls, with flat, steel-framed metal roof decks. The roof decks have rubber membranes and are insulated (approximately R-19).

Overall, the building is in very good condition, well maintained and reasonably tight.
The exterior and mechanical room doors were tested using tracer smoke equipment. Each of the exterior and mechanical room doors tested leaky and need new weatherstripping installed (this includes the interior mechanical room doors, which open to the various corridors). The roll-up overhead door was inspected and tested leaky along the top edge and a new, effective weatherstrip material needs to be installed.

The window systems in the building are aluminum-framed, double-pane, insulated systems, with a mix of fixed and operable sections. The window systems were inspected and tested using tracer smoke and ultrasound equipment. The window systems tested tight along all glazing, framing and sashes.
There are four (4) large skylights installed along the central corridor (northeast to southwest) which connect directly to the conditioned spaces below. The skylights have deteriorated exterior sealants, which need to be removed and new appropriate non-foam sealants need to be installed.

The roof-wall junctures were inspected and tested tight along all accessible sections of the building.
There are a large number of roof top fans installed that also connect directly to the conditioned spaces below. These units need to be inspected and sealed using an appropriate non-foam sealant.
Doors

The exterior and mechanical room doors were tested using tracer smoke equipment. Each of the exterior and mechanical room doors tested leaky and need new weatherstripping installed (this includes the interior mechanical room doors, which open to the various corridors). The roll-up overhead door was inspected and tested leaky along the top edge and a new, effective weatherstrip material needs to be installed.

- Weatherstrip exterior and mechanical room doors, per plans, total 31 doors
- Install center and 2 sweeps, total 9 door sets
- Weatherstrip non-standard sized mechanical room doors, per plans, total 276 lineal feet, 12 doors

Overhead Doors
There is one roll-up type overhead door installed, measuring 8’W x 9’H. The door tested leaky on the top edge only and needs to have a new, effective weatherstrip material installed accordingly.

- Weatherstrip the overhead door, (8’W x 9’H), total 8 lineal feet, 1 door

Skylights
There are four (4) large skylights installed along the central corridor (northeast to southwest) which connect directly to the conditioned spaces below. The skylights have deteriorated exterior sealants that need to be removed and new appropriate non-foam sealants need to be installed along the glazing-frame seams. Three of the skylights are 20' wide by 76', 80' and 94' feet long. The fourth skylight is 14' wide by 20' long.

- Inspect skylights, remove and replace existing glazing sealants, to seal skylights at glazing-framing seams, using appropriate non-foam sealant, total 688 lineal feet

Roof Top Fans
There are approximately 34 fans on the roof that need to be sealed. Fans should be serviced annually. Inspect fan for proper operation, clean and seal dampers.

- Inspect and seal the roof top fans, total 34 roof fans

Pond Road Middle School

The original section of the Middle School was built in 1993, with additions added in 2004 using similar construction design. The structure is constructed with steel-framed masonry walls, and steel-framed sloped metal roof decks. The majority of the building is 1-story, with higher roof sections at the gym, cafeteria, media center and tech center. A separate roof-replacement project is being planned. In general, the building is in fair condition and well maintained. However, the building is fairly leaky along the building envelope, mostly attributed to construction design issues and age-deterioration of sealant and weatherstrip materials over time.

The exterior and mechanical room doors were inspected and tested using tracer smoke and ultrasound equipment. Each of the door units is leaky and needs new weatherstripping installed. The overhead door was also inspected and tested leaky along all 4 edges. New effective weatherstrip materials need to be installed.
The window systems in the building are aluminum-framed, double-pane units, with a mix of fixed and hopper-type sections. The windows were inspected and tested using tracer smoke and ultrasound equipment. The window units tested tight along framing, glazing and sashes.

There are a number of skylights installed that directly connect to the conditioned areas below. The exterior sealants along the glazing-frame seams is dried, cracking, and deteriorated and needs to be replaced using an appropriate glazing sealant material.

The roof-wall junctures throughout the building are leaky and need to be sealed. This includes the gym, cafeteria, and media and tech center sections. The roof-wall joints need to be sealed using 2-component, closed-cell, polyurethane spray foam.

Lastly, there are a large number of roof top fans which directly connect to the conditioned spaces below as well. The fans need to be inspected, cleaned and sealed, using appropriate techniques and sealant materials.

Doors
The exterior and mechanical room doors were inspected and tested using tracer smoke and ultrasound equipment. Each of the doors is leaky and needs new weatherstripping installed. The roof-access hatch needs to be weatherstripped and sealed along the frame-roof joints. The overhead door was also inspected, and tested leaky along all 4 edges. New effective weatherstrip materials need to be installed.

- Weatherstrip exterior and mechanical room doors, per plans, total 55 doors
- Weatherstrip non-standard-sized roof access door/hatch, per plans, total 13 lineal feet, 1 hatch
- Seal hatch frame-to-roof junctures, 1-line, using 2-component, closed-cell, polyurethane spray foam, total 13 lineal feet

Overhead Doors
There is one sectional type overhead door installed, measuring 18'W x 10'H. The door tested leaky along all 4 edges and needs to have a new, effective weatherstrip material installed accordingly.

- Weatherstrip the overhead door, (18'W x 10'H), total 56 lineal feet, 1 door

Skylights
There are approximately 32 skylights installed which connect directly to the conditioned spaces below. The skylights have deteriorated exterior sealants (dried, alligator-like) which need to be removed and new appropriate non-foam sealants need to be installed along the glazing-frame seams. There is one pyramid-shaped skylight with 12 edges to seal. There are (20) that measure (4'W x 4' L) and (11) that measure (2' W x 4' L).

- Inspect skylights, remove and replace existing glazing sealants, to seal skylights at glazing-framing seams, using appropriate non-foam sealant, total 520 lineal feet

Roof-Wall
The roof-wall junctures throughout the building are leaky and need to be sealed. This includes the gym, cafeteria, and media and tech center sections. The roof-wall joints need to be sealed using 2-component, closed-cell, polyurethane spray foam. The roof-wall joints in the mechanical room also need to be sealed using two-component, closed-cell fire-rated polyurethane spray foam and intumescent barrier. All flutes on steel decking must be punched and sealed. Access to the majority of the roof-wall joints (approx 3,250 lineal feet) is above the suspended ceiling systems, at a working height of 14 feet. There are approximately 1,116 lineal feet of roof-wall at a working height of 18' - 20'. And finally, there are approximately 458 lineal feet of roof-wall joints at a working height of 26'. The higher working heights will require extension ladders and a lift could be used in some areas.

- Seal and coat with intumescent barrier the roof-wall joint and any framing penetrations, per floor plans, 1-line, at 14' feet working height, total 146 lineal feet
- Seal the roof-wall joint and any framing penetrations, per floor plans, 1-line, at 14' working height, total 3,104 lineal feet.
- Seal the roof-wall joint and any framing penetrations, per floor plans, 1-line, at 18' to 20' working height, total 1,116 lineal feet.
- Seal the roof-wall joint and any framing penetrations, per floor plans, 1-line, at 26' working height, total 458 lineal feet.

Roof Top Fans
There are approximately 55 fans on the roof that need to be sealed. Fans should be serviced annually. Inspect fan for proper operation. Inspect, clean and seal dampers.

- Inspect, clean and seal the roof top fans, total 55 roof fans

Sharon Elementary School

The original section of Sharon Elementary School was built in 1957, with additions added in 1965, 1991 and 2001. The building has 1-story and 2-story sections, and the majority of the building is constructed with steel-framed, masonry walls and steel-framed, metal roof decks. A few sections have pitched metal roof decks and the original section has a wood-framed deck. The majority of the roofing has an EPDM (ethylene propylene diene monomer) membrane, with varying amounts of insulation. The pitched sections have asphalt shingle. A roof replacement is planned by the district under a separate project.

In general, the building is in fair-to-good condition, based on age of various sections, and is well maintained. However, there is some evidence of age-deterioration of building systems in the original section and the older additions. Several areas along the exterior brick walls show significant signs of age deterioration, specifically the grout and mortar at corners, building junctures and at the masonry framing of doors & windows. Consideration should be given toward having a detailed inspection of the exterior wall surfaces performed. Overall, the building is realatively leaky, due in part to construction and design details and age-deterioration of weatherstrip and sealants along the exterior penetrations.

The exterior doors in the building were inspected and tested, using tracer smoke and ultrasound equipment. Each of the doors tested leaky along 1 or more edges and new weatherstripping needs to be installed. The overhead doors were inspected and tested leaky along all 4 sides. New, effective weatherstripping needs to be installed.

The window systems installed in the building are metal-frame, double-pane insulated units, with a mix of fixed, awning and hopper-type sections. The window systems were tested using tracer smoke and ultrasound equipment, and tested tight along the glazing, framing and sashes. In the newer sections of the building, the sidelights and transoms are 2-pane units. However, there are several single-pane sidelights and transom sections installed along a few of the entry door systems that show significant signs of age-deterioration and are leaky along the frame-wall junctures. Consideration should be given toward replacing these old single-pane units with new Energy Star rated double-pane, insulated units.

The roof-wall junctures were tested throughout the structure, using tracer smoke and ultrasound equipment. All of the roof-wall junctures are leaky and need to be sealed using 2-component, closed-cell, polyurethane spray foam. In the original section of the building, the exterior walls have large openings to the vented soffits and are very leaky. These sections need to be sealed using Thermax and 2-component, closed-cell, polyurethane spray foam.

In the original section and each of the earlier additions, PTAC (packaged terminal air conditioner) units were utilized to condition the spaces. Prior to the newest addition being built (2001), all of the heating equipment was moved above the ceilings. However, the make-up air vents/grilles associated with the PTAC units, which are installed through the exterior walls, were not effectively sealed. They appear to be a major source of air leakage through the building envelope and of ongoing comfort complaints by occupants (staff, workers & students). These vents need to be effectively sealed shut, using appropriate sealant materials (e.g. Thermax and 2-component, closed-cell polyurethane spray foam). Additonally, there are several thru-the-wall air-conditioning units installed which are leaky along the housing-frame junctures and need to be sealed, using an appropriate non-foam sealant material.

Lastly, there are a large number of roof top fans installed that connect directly with the conditioned areas below. These fan units need to be inspected and sealed using appropriate techniques and sealant materials.

Doors

The exterior doors in the building were inspected and tested, using tracer smoke and ultrasound equipment. Each of the doors tested leaky along 1 or more edges and new weatherstripping needs to be installed.

- Weatherstrip exterior doors, per plans, total 37 doors
- Install sweep only, total 4 sweeps

Overhead Doors

The sectional-type overhead doors were inspected and tested leaky along all 4 sides. New, effective weatherstripping needs to be installed.

- Weatherstrip the overhead doors, (10'W x 10'H and 8'W x 10'H), all 4 sides of each, total 76 lineal feet

Windows

There are several single-pane sidelights and transom sections installed along a few of the entry door systems that show significant signs of age-deterioration and are leaky along the frame-wall junctures. Consideration should be given toward replacing these old single-pane units with new Energy Star rated double-pane, insulated units.

- Replace 18 single-pane and transom sections.

Roof-Wall

The roof-wall junctures were tested throughout the structure using tracer smoke and ultrasound equipment. All of the roof-wall junctures are leaky and need to be sealed with 1-line, using 2-component, closed-cell, polyurethane spray foam. There are approximately 764 lineal feet of roof-wall joints at a working height of 20 feet. Approximately 396 lineal feet at 16' working height and 1,700 lineal feet at a working height of 14 feet. The majority of the roof-wall joints are located above suspended ceiling systems. In the original section of the building, the exterior walls have large openings (approximately 8" high) to the vented soffits and are very leaky. These sections of roof-wall junctures need to be sealed using

Thermax and 2-component, closed-cell, polyurethane spray foam.

- Seal the roof-wall joint and any framing penetrations, per floor plans, 1-line, at 14' working height, total 1,700 lineal feet.
- Seal the roof-wall joint and any framing penetrations, per floor plans, 1-line, at 16' and 20' working heights, total 1,160 lineal feet.
- Seal the wall/soffit openings, 8" high gaps, using Thermax and 2-component, closed-cell polyurethane spray foam, to seal the seams, total 476 lineal feet

Miscellaneous Sealing (Foam/Thermax)

The make-up air vents/grilles which are installed through the exterior walls (associated with the old PTAC units) were not effectively sealed and appear to be a major source of air leakage through the building envelope. These vents need to be effectively sealed shut, using appropriate sealant materials (e.g. Thermax and 2-component, closed-cell polyurethane spray foam).

- Seal shut the old make-up air vents, installed in exterior walls, using 2" Thermax and seal all seams with 1-line, using 2-component, closed-cell polyurethane spray foam, total 312 lineal feet foam, and 130 square feet Thermax

Miscellaneous Sealing (Non-Foam)
There are several TTW (through the wall) A/C units installed through the exterior walls and leaky along the housing-to-frame seams. These units need to be effectively sealed along the housing-frame seams, 1-line along all 4 sides, using an appropriate non-foam sealant material.

- Seal TTW A/C units, 1-line, along all 4 sides – at the housing-frame seams, using appropriate non-foam sealant, total 54 lineal feet

Roof Top Fans
There are approximately 48 fans on the roof that need to be sealed. Fans should be serviced annually. Inspect fan for proper operation. Inspect and clean dampers.

- Inspect and seal the roof top fans, total 48 roof fans

Windsor Elementary School

The Windsor Elementary School was built in 1909, and constructed with steel framing, brick masonry walls and a wood-framed, sloped, wood roof deck. The building is a 2-story structure with a partially finished basement (utilized as an office area and storage) and an insulated attic floor (fiberglass batts, approximately R-24). In general, considering the age of the building, it is in fair condition and fairly well maintained. Overall, the building is moderately leaky.

The exterior doors in the building were inspected and tested leaky using tracer smoke. New weatherstrip materials need to be installed. There are two (2) old, Bilco-type storm door systems in the rear that are in deteriorated condition, allowing a significant amount of air and moisture leakage through the building envelope. Consideration should be given to replacing these units with new insulated Bilco-type doors.

Consideration should also be given toward replacing the large, steel vault-like mechanical room door (with counter weight) as the door framing is damaged and the door cannot be effectively closed completely or weatherstripped effectively. This allows the mechanical room to communicate directly with the conditioned spaces directly outside the room (e.g. potential for flue gases, moisture, etc. to enter the conditioned, occupied space). The existing attic hatch and framing is deteriorated and a repair needs to be made to the framing to accommodate a new hatch door/panel. The new door needs to have 4" Thermax insulation affixed to attic side and the door needs to be weatherstripped.

There are newer, metal-framed, double-pane insulated window systems installed throughout the building. The majority of the windows tested tight along the glazing, framing and sashes. A few are leaky along the frame-wall seams and need to be sealed using an appropriate non-foam sealant. There are several thru-the-wall air-conditioning units installed that are leaky along the housing-to-wall seams and need to be sealed using an appropriate non-foam sealant. One of the A/C units is mounted in the framing of an old fan coil unit, which is mounted through the exterior wall. The unit's framing is also leaky along the frame-wall junctures and also needs to be sealed, using an appropriate non-foam sealant.

Additionally, there is an old coal delivery chute in place, with 2 oil pipes passing through to the exterior. The opening of the chute needs to be sealed with 2" Thermax, with the pipe penetrations and seams sealed with 2-component, closed-cell, polyurethane spray foam.

Lastly, there are several penetrations in the attic floor that need to be sealed using appropriate sealant materials (e.g. Thermax, mastic, 2-component, closed-cell polyurethane spray foam, etc.)

Doors

The exterior doors in the building were inspected using tracer smoke and tested leaky. New weatherstrip materials need to be installed. There are two (2) old, Bilco-type storm door systems in the rear that are in deteriorated condition, allowing a significant amount of air and moisture leakage through the building envelope. Consideration should be given replacing these units with new insulated Bilco-type doors. Consideration should also be given toward replacing the large, steel vault-like mechanical room door, with counter weight as the door framing is damaged and the door cannot be closed completely or weatherstripped effectively. The existing attic hatch and framing is deteriorated and repairs need to be made to the framing to accommodate a new hatch door/panel which needs to be installed. The new door needs to have 4" Thermax insulation affixed to attic side and the door needs to be weatherstripped.

- Weatherstrip exterior doors, total 6 doors
- Replace two (2) Bilco-type storm doors with new insulated Bilco-type storm doors. The existing doors measure 4'W x 6'L each, total 40 lineal feet, 2 door systems
- Replace large boiler room door, with new Energy Star rated, insulated door. The existing door measures 3'6"W x 7'H, total 21 lineal feet, 1 door

Windows

There are newer metal-framed, double-pane insulated window systems installed throughout the building. The majority of the windows tested tight along the glazing, framing and sashes. A few are leaky along the frame-wall seams and need to be sealed, using an appropriate non-foam sealant.

- Seal around frame-to-wall junctures, per floor plans, 1-line, using appropriate non-foam sealant, total 68 lineal feet

Miscellaneous Sealing (Non-foam)

There are several thru-the-wall air-conditioning units installed which are leaky along the housing-to-wall seams and need to be sealed using an appropriate non-foam sealant. One of the A/C units is mounted in the framing of an old fan coil unit, which is mounted through the exterior wall. The unit's framing is also leaky along the frame-wall junctures and also needs to be sealed using an appropriate non-foam sealant.

- Seal housing-wall seams at TTW A/C units, 1-line, using an appropriate non-foam sealant. Each unit measures 2'6"w x 2'h, total 54 lineal feet
- Seal frame-wall seams at old fan coil unit (5'w x 3'h), 1-line, using an appropriate non-foam s ealant, total 16 lineal feet

Miscellaneous Sealing (Thermax, Spray Foam)

There is an old coal delivery chute in place with two 3" oil pipes passing through to the exterior. The opening of the chute needs to be sealed with 2" Thermax, with the pipe penetrations and seams sealed with 2-component, closed-cell, polyurethane spray foam.

- Seal chute opening with 2" Thermax foam board and foam sealant, chute opening measures 3'w x 2'h, total 6 square feet

Attic Insulation and Air Sealing
The attic is wood-framed, with open beam flooring. There is approximately 8" of existing batt insulation installed. Although insulation needs to be added to attain R-30, it is not cost-effective to do so.

The air barrier between the conditioned and unconditioned spaces is moderately leaky. There are approximately 8 electrical box penetrations, one large duct chase (3'6" x4') and a chimney chase (4'x 4') that need to be sealed. The existing hatch framing needs to be repaired. A new hatch door needs to be installed, insulated with 4" Thermax and weatherstripped. A dam, that will hold the weight of a person and is higher than finished insulation depth, needs to be built around the hatch. The hatch opening is approximately 2'6" x 2'6".

- Repair attic hatch framing and install new hatch door/panel. Weatherstrip, insulate with 4" Thermax and build dam that will hold a person's weight around the 2'6" x 2'6" attic hatch, total 1
- Seal eight (8) electrical boxes, one (1) plumbing duct, and one (1) chimney penetration in attic floor, total 10 penetrations

Benefits
The sealing of the school buildings will allow for more efficient operation of the buildings by reducing heating and cooling losses throughout the year. In addition, the draftiness of the buildings, along with hot and cold spots, will be reduced as a result of this measure. A reduction in air infiltration will also minimize potential concerns for dirt infiltration or indoor air quality.

Energy Savings Methodology and Results
The energy savings for this ECM are realized at the buildings' HVAC equipment. The improved building envelope will limit conditioned air infiltration through openings in the building air barrier. Less infiltration means less heating required by the heating system.

Changes in Infrastructure
Building envelopes will be improved with little or no noticeable changes.

Customer Support and Coordination with Utilities
Minimal coordination efforts will be needed to reduce or limit impact to building occupants.

Environmental Issues

Resource Use	Energy savings will result from reduced HVAC energy usage and better occupant comfort.
Waste Production	Some existing caulking and weather-stripping will be removed and disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 4B
Roof Replacements

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
4B	Roof Replacements		✓		

Existing Conditions

The roof installed at Pond Road MS has many issues and is recommended to be replaced. The heat loss and heat gains occur due to low R-value of the existing roof insulation will be improved through the replacement with energy efficient roofing materials. Additionally the rate of infiltration that occurs due to the leakage on the roof around perimeters and equipment curbing is also a major cause of energy loss.

Existing Roof at Pond Road MS

The upgrade will result in improved savings and comfort for those affected in the building. Honeywell proposes the installation of a new energy efficient, Spray Polyethylene Foam (SPF) roofing material over the traditional Ethylene Propylene Diene Monomer (EPDM) single ply roof. The Poly Spray Foam Roof is one monolithic, self flashing system with air barrier – no loss of effective R-value. Overall, through the implementation of this measure the district will reduce its heating fuel usage and air conditioning costs each year. Honeywell has also evaluated an EPDM membrane overlay roof with fiber backing, but energy savings is minimal due to low insulating values.

Proposed System

Polyurethane Foam Roof – Honeywell Enovate Technology

The project includes providing all work and materials necessary to prepare the existing roof areas to receive a new polyurethane spray foam roof system. The new roof system is inclusive of recovery board, polyurethane foam, protective coating and granules.

The new roof system shall consist of an application of recovery board, 2.8–3.0 lb. density polyurethane foam and a base and top coat of a white silicone coating with granules embedded in top coat. This system shall be installed in accordance with appropriate installation procedures as specified in the manufacturer's published instructions. New foam will utilize Honeywell's Enovate® Blowing Agent.

Energy Efficiency
An EPDM Single-ply roof with an initial R-value of 18 will have a 15%+ loss in thermal resistance due to thermal shorts of steel fasteners. It will also have 10% increase in thermal transmittance when using a single layer of insulation board. Additionally, R-value and air permeability of the deck, insulation and membrane will have a major impact on System R-value. In consideration of all of these losses, this type of roofing system will result in a final overall System R-value equal to approximately 2.42.

In contrast, an SPF roof has an R-value or thermal resistance of approximately 6 (i.e. per one (1) inch foam R-value 6). Therefore, if three inches of SPF Foam were applied as one monolithic, self flashing system with an air barrier and no loss of effective R-value, the new roof would have an overall System R-value equal to 18.

Durability
Single-ply EPDM roof will have a 45 mil water proofing layer, but will also have major fail points such as flashing, seams, fasteners and single-ply punctures. In contrast, the SPF roof will have a top coat plus SPF insulation which is all water proofing, meaning even damaging the top coat will not create leak.

Sustainability
Commercial buildings can have a maximum of 2 roofs in place. In traditional roofing, when a "third" roof is required, a partial or full tear-off is also required. This adds increased cost for tear-off, increased cost for disposal and a negative impact on the environment

With SPF roofing, the top coat is the only part that needs to be re-applied after the warranty period. There is no "tear-off" required or disposal concerns. A quality applied SPF roof should last the life of the building.

School	Roof Area (SF)
Pond Road MS	156,802

Energy Savings Methodology and Results
Following approach is used to determine savings for this specific measure:

Existing Roof Efficiency	= Existing U + Existing Infiltration Rate
Proposed Roof Efficiency	= Proposed U + Proposed Infiltration Rate
Energy Savings (Btu) Winter Savings(Therms) Summer Savings (Tons Cooling)	= UAdTproposed – UAdTexisting = Energy Savings/Boiler Eff./100,000 = Energy Savings/12,000 Btu/Ton

Interface with Building:
The new roof will be constructed to match existing, maintaining contours of the existing building.

Energy Savings Methodology and Results
The energy savings for this ECM are realized at the buildings' HVAC equipment. The improved building envelope will limit conditioned air infiltration through openings in the building air barrier. Less infiltration means less heating and cooling required by HVAC systems.

Changes in Infrastructure
Building envelopes will be improved with little or no noticeable changes.

Customer Support and Coordination with Utilities
Minimal coordination efforts will be needed to reduce or limit impact to building occupants.

Environmental Issues

Resource Use	Energy savings will result from reduced HVAC energy usage and better occupant comfort.
Waste Production	Existing roof materials will be removed and disposed of properly.
Environmental Regulations	No environmental impact is expected.

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ECM 4C
Window Replacements

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
4C	Window Replacements			✓	

Existing Conditions

The existing windows at Sharon Elementary School have leakage around the window panes as well as poor insulation on the frame perimeter. These two factors result in loss of heating and some cooling from the occupied areas by conduction through the glass as well as infiltration of unconditioned air through the leaking panels.

Proposed Solution

The heat loss and heat gains occur due to low R-value of the existing windows which will be improved through their replacement with energy efficient double pain low-e windows. Additionally the rate of infiltration that occurs due to the leakage around the frames is also a major cause of energy loss and will be corrected through higher R-value insulation when the new windows are installed.

The upgrade will result in energy savings and improved comfort to building occupants. In addition, the District also wishes that these windows be replaced. Honeywell proposes the installation of new energy efficient, double-paned windows to reduce infiltration, infrared and conductive losses. Overall, through the implementation of this measure the school will reduce its heating fuel usage and air conditioning costs each year.

School	Window Area to be Replaced (ft^2)	Count	Type
Sharon ES	960.5	80	Windows
Sharon ES	21	6	Door Side Lights
Total	**981.5**	**86**	

Scope of Work

1. Demolition and disposal of 80 Windows (approximately 981.5 square feet of glass area) including door side lights at Sharon ES.
2. Installation of new double glazed commercial rated aluminum windows and framing. Insulating glass shall be made with one piece of clear glass, one piece of soft coat Low "E" glass.

Energy Savings Methodology and Results
Following approach is used to determine savings for this specific measure:

Existing Window Efficiency	= Existing U + Existing Infiltration Rate
Proposed Window Efficiency	= Proposed U + Proposed Infiltration Rate
Energy Savings $	= UAdt*Hours/boiler efficiency +((Existing Airflow – proposed airflow) **x** 1.08 (OA Avg. Temp – Inside Avg. Temp)**/(**boiler efficiency) **x** (fuel cost)

Changes in Infrastructure
New efficient windows in areas identified

Customer Support and Coordination with Utilities
Minor support will be required for the interruption of spaces occupied where windows are being replaced

Environmental Issues

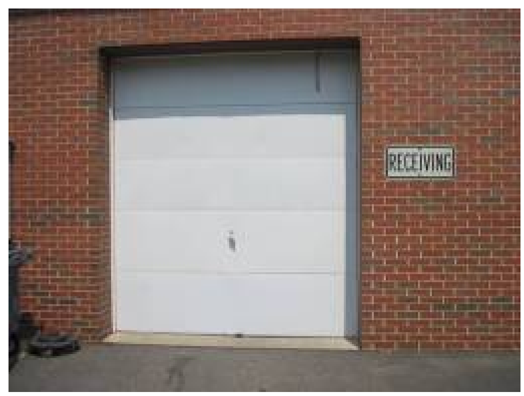
Resource Use	Energy savings will result from the reduction of heat loss from the un-insulated windows and infiltration resulting in lower fuel consumptions. The equipment uses no other resources.
Waste Production	This ECM will produce waste by products. Waste will consist of old windows and frames.

ECM 4D
Door Replacements

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
4D	Door Replacements			✓	

Existing Conditions

Multiple doors installed at the Sharon Elementary School in the original wing are in poor condition and a source of energy loss and infiltration. The rate of infiltration that occurs due to the leakage around the frames is a major cause of energy loss. The upgrade will result in substantial savings and improved comfort to those occupying building.



Sharon ES Doors

Proposed Solution

Honeywell proposes the installation of new energy efficient insulated doors to reduce infiltration and conductive losses. Overall, through the implementation of this measure the complex will reduce its heating fuel and cooling usage costs each year.

School	Location	Number of Doors to be Replaced
Sharon ES	North West Front Classroom Addition - L	1
Sharon ES	North West Front Classroom Addition- R	1
Sharon ES	West Front Classroom Addition - L	1
Sharon ES	West Front Classroom Addition - R	1
Sharon ES	South West Front Classroom Addition - L	1
Sharon ES	South West Front Classroom Addition - R	1
Sharon ES	Cafeteria - Single	1
Sharon ES	Cafeteria - Double - L	1
Sharon ES	Cafeteria - Double - R	1
Sharon ES	Receiving Bay Door - L	1
Sharon ES	Receiving Bay Door - R	1
Total		**11**

Energy Savings Methodology and Results

Following approach is used to determine savings for this specific measure:

Existing Door Efficiency	= Existing Crack Area + Existing Infiltration Rate
Proposed Door Efficiency	= Proposed Crack Area + Proposed Infiltration Rate
Energy Savings $	= Audit*Hours/boiler efficiency +((Existing Airflow – proposed airflow) **x** 1.08 (OA Avg. Temp – Inside Avg. Temp)**/(**boiler efficiency) **x** (fuel cost)

Changes in Infrastructure

The appearance of the exterior of the above mentioned buildings will improve significantly.

Customer Support and Coordination with Utilities

The service to the specific locations may require interruption to allow for the replacement of the existing doors. Coordination with District personnel will be required to minimize interruption.

Environmental Issues

Resource Use	Energy savings will result from the reduction of heat loss from the un-insulated doors and infiltration resulting in lower fuel consumptions. The equipment uses no other resources.
Waste Production	This ECM will produce waste by products. Waste will consist of old doors and frames.

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ECM 5A
Power Factor Optimization

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
5A	Power Factor Optimization	✓	✓	✓	

Existing Conditions

Low power factor is expensive and inefficient. Many utility companies charge an additional fee if the power factor is less than 0.95. Low power factor also reduces the electrical system's distribution capacity by increasing current flow and causing voltage drops.

Power Factor is defined as Working (real) power divided by Apparent Power. Low power factor is caused by inductive loads (such as transformers, electric motors, and high-intensity discharge lighting), which are a major portion of the power consumed in commercial complexes such as schools. Unlike resistive loads that create heat by consuming kilowatts, inductive loads require the current to create a magnetic field, and the magnetic field produces the desired work. The total or apparent power required by an inductive device is a composite of the following:

- Real power (measured in kilowatts, kW)
- Reactive power, the nonworking power caused by the magnetizing current, required to operate the device (Measured in kilovars, kVAR)

Reactive power required by inductive loads increases the amount of apparent power (measured in kilovoltamps, kVA) in your distribution system. The increase in reactive and apparent power causes the power factor to decrease.

Benefits of improving your power factor include decreasing the District's utility bill. Low power factor requires an increase in the electric utility's generation and transmission capacity to handle the reactive power component caused by inductive loads.

Pond Road MS Main Panel

Sharon ES Main Panel

Proposed Scope

Honeywell proposes a KVAR Energy Control (KEC) Unit at each main electrical panel. In relation to commercial electrical energy efficiency, the KEC increases power factor by reducing the amount of reactive power (kVAR) that the load draws from the utility company.

Qty	School	Panel Amps	KEC	Amps
2	Robbinsville HS	4000	GR-1000	2000
2	Pond MS	2000	GR-600	1200
1	Sharon ES	600	GR-400	400
1	Sharon ES	800	GR-600	800

Table 5A.1 Power Management Units

Since, reactive power is the power that comes from the power company, through the utility meter and goes to the windings of motors to create the electromagnetic field so that the motor will turn. The wasteful part is that this energy is never consumed; it creates the magnetic field and is then dissipated in the form of heat. Because we have 60 cycle electricity, this process must be repeated 60 times every second to keep the motor running. KEC Units store the reactive power (KVAR) needed for the creation of the electromagnetic field within the inductive load. As the motor operates, this reactive power is "pulled" and "pushed" to and from the KEC by the motor. As a result the amount of reactive power required from the utility company has been greatly reduced or eliminated and the initial power spike is reduced.

Typical KVAR Energy Control Unit

Equipment Information

Manufacturer and Type	Several quality and cost effective manufacturers are available. Honeywell and Robbinsville Public School District will determine final selections. All equipment will be UL rated.
Equipment Identification	Product cut sheets and specifications for generally used equipment are available upon request. As part of the measure design and approval process, specific product selection will be provided for your review and approval.

Energy Savings Methodology and Results

The savings approach is based upon reducing the increase in power factor or decrease in reactive power The savings are generally calculated as:

Power Factor	= Real Power (kW) /Apparent power (kVA)
Apparent Power	= SQRT(Real Power^2 + Reactive Power^2)
Reactive Power	= kVAR (non-working power caused by magnetizing current

Changes in Infrastructure

KEC Units will be added to the main power distribution panels.

Customer Support and Coordination with Utilities

Minor support will be required for the interruption of utilities for brief tie-in periods.

Environmental Issues

Resource Use	Energy savings will result from reduced energy.
Waste Production	None.
Environmental Regulations	No environmental impact is expected.

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ECM 5B
Transformer Replacements

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
5B	Transformer Replacements	✓	✓	✓	

Existing Conditions

The majority of the electrical distribution systems at the Robbinsville Public School District consist of 480 Volts. Distribution transformers are installed in the boiler room and in various electrical closets to step down the voltage to 120-208 Volts. Typically, an electrical distribution system has some losses associated with the electrical system and a considerable portion of these losses are associated with distribution transformers.

Robbinsville HS Typical Transformer

Pond Road MS Transformer

Systems Evaluation and Selection

Typical transformers are not designed to handle harmonic loads of today's modern facilities, and suffer significant losses as a result, even if the transformer is relatively new. Typically, conventional transformer losses, which are non-linear, increase by 2.7 times when feeding computer loads. The nonlinear load loss multiplier reflects this increase in heat loss, which decreases the net transformer efficiency. Also, unlike most substation transformers that are vented to the exterior, building transformers are ventilated within the building they are located, and their heat losses therefore add to the cooling load.

Proposed Scope:

Based on site investigation conducted by our staff, we found forty two (42) transformers that we propose to replace with energy efficient ones at a size matching the existing loads as indicated in the table below:

No.	School	Location	Designation	KVA
1	Robbinsville HS	first floor mech. rm.	SR-1/SR-2	300
2	Robbinsville HS	first floor mech. rm.	RP-1D	112.5
3	Robbinsville HS	C Wing elect. rm.	AP-1C / HP-1C	150
4	Robbinsville HS	IDF A-1	RP-1A / HP-1A	75
5	Robbinsville HS	B Wing Elect. Rm.	RP-1A / HP-1A	75
6	Robbinsville HS	shipping rec. elec. rm.	KP-2	150
7	Robbinsville HS	shipping rec. elec. rm.	KEP	30
8	Robbinsville HS	2nd floor mechanical	RP-2D / LP-2D	75
9	Robbinsville HS	2nd floor electrical	RP-2C / LP-2C	75
10	Robbinsville HS	B-2 Mech. Rm.	RP-2B / LP-2B	75
11	Robbinsville HS	A-2 Tech. Rm.	RP-2A / LP-2A	75
12	Robbinsville HS	poll barn	RP1 / PP1	75
13	Pond Road MS	Maintenance office	T_45KVA	45
14	Pond Road MS	C wing elec. rm.	MDP / MDP F2	150
15	Pond Road MS	Maintenance office	RPB3	30
16	Pond Road MS	boiler rm. gen. rm.	ERP1	75
17	Pond Road MS	boiler rm. elec. rm	RPB1 / LPB1	30
18	Pond Road MS	stage elect. rm.	RPB2 / LPB2	30
19	Pond Road MS	M1	RCP1 / LCP1	45
20	Pond Road MS	elect. Rm. by main office	RPA1 / LPA1	75
21	Pond Road MS	F-1 Storage	RPE1 / LPE1	75
22	Pond Road MS	D104 mech. rm.		45
23	Pond Road MS	D104 mech. rm.		15
24	Pond Road MS	C101 Elect. Rm.	RPD1 / LPD1	75
25	Sharon ES	Grounds		300
26	Sharon ES	New Boiler Room		300

Table 5B.1 – Existing Transformers to be Replaced

The proposed transformers will be Power Smiths High Efficiency K-Star Harmonic Mitigating units. They are Energy-Star rated and meet the new TP1 Law requiring replacement of transformers of 600 volts or under.

Scope of Work:

1. Remove existing transformer and install four (1) new E-saver-C3L-15-480-208/120
2. Remove existing transformer and install five (4) new E-saver-C3L-30-480-208/120
3. Remove existing transformer and install thirteen (3) new E-saver-C3L-45-480-208/120
4. Remove existing transformer and install eleven (11) new E-saver-C3L-75-480-208/120
5. Remove existing transformer and install eight (1) new E-saver-C3L-112.5-480-208/120
6. Remove existing transformer and install one (3) new E-saver-C3L-150-480-208/120
7. Remove existing transformer and install one (3) new E-saver-C3L-300-480-208/120

Per Transformer Unit:

- Shut off the main electric power to the transformer to be replaced.
- Disconnect the existing transformer and install replacement unit.
- Turn power back on.
- Inspect unit operation by performing electrical and harmonics testing.
- Dispose of old transformers properly.

Energy Savings Methodology and Results

The energy savings for this ECM is realized by reduction in electric energy lost in the existing transformers as a result of the higher efficiency of the new transformers

Changes in Infrastructure

New transformers where indicated

Customer Support and Coordination with Utilities

Minor support will be required for the interruption of services for the affected areas

Environmental Issues

Resource Use	Energy savings will result from reduced energy.
Waste Production	Any removed parts will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

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ECM 5C
Premium Efficient Motors and VFDs

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
5C	Premium Motors and VFDs		✓	✓	

Existing Conditions
Honeywell has indentified standard efficiency electric motors on hot water pumps. Energy savings can be obtained by replacing the standard efficiency motors with premium efficiency motors.

Pond Road MS HHW Pumps

Sharon ES HHW Pumps 2001 Wing

School	Equipment Description	Pump Model	Qty	Motor HP	Replace Motor Y/N	Add VFD Y/N
Pond Road MS	HW Pumps	Armstrong	2	10	Y	Y
Sharon ES*	HW Pumps	AO Smith	2	10	Y	Y
Sharon ES	HW Pumps	Dayton	2	7.5	Y	Y

**Sharon ES School HHW pumps (4 zones) will be replaced with two (2) pumps when new boilers are installed.*

Table 5C.1 – Existing Motors

Proposed System
Honeywell proposes the replacement of all above mentioned single speed standard efficiency motors (not having VFD's) with new premium efficiency units, installing new couplings where applicable. In addition, we are recommending installing VFD's on these pumps. The scope of work will be as follows:

1. Remove and dispose of the existing standard efficiency motors.
2. Inspect all couplings and replace as needed.
3. Install new motors on the existing pumps designated.
4. Align the couplings to EASA standards.

5. Install VFD's on the pumps.
6. Install wiring and controls on the new VFD's.
7. Measure and verify the pre and post-retrofit voltage, amperage, and RPM.

Energy Savings Methodology and Results

The energy consumed by electric motors varies inversely to the cube of the motor speed. Variable speed drives reduce motor speed (in response to load) thus reducing energy consumption exponentially

Equipment Information

Manufacturer and Type	Several quality and cost effective manufacturers are available. The following is an example of equipment being utilized. Honeywell and the District will determine final selections.
Equipment Identification	Product cut sheets and specifications for generally used are available upon request. As part of the measure design and approval process, specific product selection will be provided for your review and approval.

Changes in Infrastructure

New motors will be installed in place of the old motors. No expansion of the facilities will be necessary.

Customer Support and Coordination with Utilities

Coordination of the electrical tie-in will also be required.

Environmental Issues

Resource Use	Energy savings will result from reducing electrical usage by operating higher efficiency motors for the same horsepower output. The equipment uses no other resources.
Waste Production	This measure will produce waste by products. Old motors shall be disposed of in accordance with all federal, state and local codes.
Environmental Regulations	No environmental impact is expected.

ECM 6A
Water Conservation

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
6A	Water Conservation	✓	✓	✓	✓

DOMESTIC MEASURES

TOILETS

Existing Conditions
There are a total of 181 toilet fixtures within the schools. These are a mixture of wall hung and floor mounted units with the majority (176) being designed to flow at 1.6gpf. Additionally, there are 7 floor mounted, 1.6gpf infant height toilet fixtures. Lastly, there are 23 residential style tank toilets.

Proposed Solution
Honeywell recommends replacing the floor mount commercial 3.5gpf toilets with 1.28gpf china and 1.6gpf manually actuated diaphragm flush valves. This unique china/valve pairing will ensure the infrastructure is in place if the schools decide to implement further water efficiency measures in the future. Also, as maintenance issues often arise in K12 schools from foreign objects being flushed down the toilets, the 1.6gpf volume will ensure line carry and blockage issues is at a minimum.

It is also recommended that the tank toilets be replaced with 1.0gpf pressure assisted fixtures. As these are pressure assisted, line blockage issues are not as significant as with gravity fed fixtures.

The scope of work includes:
1. (5) Replace 3.5gpf floor mounted toilets with 1.28gpf Kohler floor mounted china and 1.6gpf manually actuated Sloan diaphragm flush valves.
2. (18) Install 1.0gpf Mansfield pressure assist tank toilet.
3. (5) Install 1.0gpf Mansfield ADA pressure assist tank toilet.

TOILET INSTALLATION NOTES
1. New toilet bowls will be installed onto existing flanges and carriers with new Beneke (or equivalent) commercial open front plastic seats, less cover (white in color)
2. Generally, the retrofit is a like for like material replacement. If a handicap accessible stall with hand rails has been installed to modify an existing bathroom for ADA compliance and the toilet is not at ADA height, we will attempt to make the toilet in this stall meet ADA guidelines. To accomplish this, floor mounted ADA toilets will replaced with new ADA height toilets.

3. Flushometer valves and toilet bowls will be installed to meet all state and federal uniform plumbing codes. The ASSE CL1001 atmospheric vacuum breaker code requires that the vacuum breaker critical line (CL) be installed 6" above the floodplain of the toilet (or urinal). The CL is denoted on the exterior of the flush valve vacuum breaker tailpiece with a visible CL line. The flood-plain of a toilet is defined as the highest point at which water will overflow a fixture
4. All toilet bowls will be securely connected to water supply lines and waste connections. Minor repairs to floor mount toilet flanges will be made to ensure secure toilet bowl connections. Floor mounted toilet flanges will be repaired as needed with a repair anchor flange, Cast Iron Flange Repair Ring anchored to the floor with 4 tap-con bolts or spanner flanges.
5. Minor repairs to water supply connections include replacement of 1" horizontal water lines, as required, to rough plumb flush valves when installing new toilet bowls. All piping modifications will be made with material that complies with standard trade practice and like to existing materials.
6. New toilets will be installed with new control stop valves or Angle stop valves.

URINALS

Existing Conditions
There are a total of 44 urinals spread throughout the men's bathrooms of the schools. All fixtures are either 1.5/1.0gpf wall hung, wash down fixtures with either manual or sensor actuated flush valves.

Proposed Solution
Honeywell recommends converting from sensor flush valves to manually actuated 0.5gpf flush valves on all 1.0/1.5gpf urinal fixtures. This reduces water consumption by at least 50% per flush while still completely rinsing and evacuating the fixture.

Quantities and types included in the scope of work are:
1. (44) Retrofit existing 1.0gpf wash down urinal china with Sloan 0.5gpf manual diaphragm flush valve.

URINAL INSTALLATION NOTES
1. Flush valves will be installed to the minimum required height of 6" above the flood plain (urinal rim) as required by plumbing code.
2. All new urinal valves will be installed with new control stop valves. Urinal china replacement includes new hanging brackets and waste gaskets. All efforts will be made to clean walls and remove old footprints. Holes exposed as a result of the retrofit will be filled with tile grout and caulking.

FAUCETS & SHOWERS

Existing Conditions
During the audit, a total of 437 lavatory, kitchen, and classroom faucets were identified. It is estimated that the lavatory faucets are flowing at an average rate of 1.5 gallons per minute (gpm), while the kitchen and classroom faucets have a flow volume of 2.3gpm.

Honeywell estimates that 27 of the existing 62 showers located in the locker room areas of the schools are used and offer savings if retrofit. These showers have an estimated average flow rate of 2.5gpm and will be replaced with 1.75gpm showerheads.

Proposed Solution
Faucets that can accept flow controls will be retrofitted with the following controls matched to the end use: bathroom sinks will be fitted with 0.5gpm flow controls, classroom (non-lab style) faucets will be retrofitted with 1.0gpm flow controls, and kitchen faucets will be adapted with 1.5gpm controls. Traditional and ADA compliant handheld showerheads will be retrofitted with 1.75gpm heads.

Quantities and types included in the scope of work are:

1. (114) Replace existing threaded aerators on common area and restroom sinks with 0.5gpm tamperproof faucet restrictors.
2. (21) Replace existing threaded aerators on kitchen sinks with new 1.0gpm tamperproof faucet restrictors and applicable adaptors.
3. (105) Replace existing threaded aerators on classroom sinks with new 1.0gpm tamperproof faucet restrictors and applicable adaptors.
4. (21) Replace existing traditional showerhead with 1.75gpm pressure compensating AM Conservation showerhead.
5. (6) Replace existing ADA compliant handheld showerhead with 1.75gpm pressure compensating AM Conservation handheld showerhead.

NON-DOMESTIC MEASURES

Non-domestic measures refer to all water using processes not in the aforementioned domestic section. This includes, but is not limited to, cooling towers, pools, irrigation, process water use, laundry, kitchen equipment, etc. For the purpose of this report, energy reduction measures are also included in this section.

The non-domestic usages identified within the facilities include pre-rinse sprayers. Additionally, facility staff indicated that water bottle fill stations shall be retrofitted on the drinking fountains, therefore it is also included within this section.

PRE-RINSE SPRAYER

Existing Conditions
Two pre-rinse sprayers were identified within the kitchens of schools. These spray nozzles are used throughout the day for rinsing food off dishware or trays before entering a dishwasher. The nozzles found in kitchens are functioning at an average flow rate of 3.0 gallons per minute with an average daily use of 10 minutes per day.

Proposed Solution
It is recommended that the high flow pre-rinse spray nozzles be replaced in favor of lower flow, 1.42gpm units. Additionally, because end-users mix hot water in with cold to rinse dishes, reducing flow at these fixtures saves energy as well as water.

WATER FOUNTAINS

Existing Conditions

Staff at the Pond Road Middle School indicated that they would like 25 of the school's existing drinking fountains retrofitted with combination water fountain / water bottle fill stations. This measure will help reduce plastic cup and bottle disposal, thereby reducing the amount of waste the school is contributing to landfills.

Existing Water Fountains at Pond Road MS

The water fountains were also identified by the staff as being in constant need of repair. It is also noted water fountains consume between 7.8 to 10.8 kWh per week of usage. This is based on a refrigeration cycle time of 60% and a 40 hour occupied week.

Proposed Solution

Replace existing Four (4) Station Refrigerated Water Fountains with Two (2) combination water fountain / bottle fill stations.

Honeywell recommends retrofitting the 25 drinking fountains with the Elkay EZH2O Model EZWSRK retrofit kit. This unit will provide pure, drinking water at a rate 3 times faster than if filling at a normal drinking fountain. The system is sanitary, no touch, sensor operated with a 20 second shut off timer. Additionally, it provides a laminar flow to minimize splashing and has a "Green Ticker" which counts the quantity of bottles saved from the landfill.

Water Conservation Measures Per Measure Worksheet	Pond Road Middle School	Robbinsville High School	Sharon Elementary School	Windsor Elementary School	TOTALS	Pre Install Flow	Post Install Flow
TOILETS Existing Low Flow Toilet	66	59	28	0	153	1.61	1.61
Install new 1.28gpf Kohler china and 1.6gpf Sloan diaphragm flush valve.	0	0	5	0	5	3.38	1.6
Install new 1.0gpf Mansfield pressure assist tank toilet	0	1	13	4	18	1.84	1
Install new 1.0gpf ADA Mansfield pressure assist tank toilet	0	0	3	2	5	1.73	1
FAUCETS Retrofit with 0.5gpm Neoperl aerator	50	19	39	6	114	1.64	0.5
Retrofit with 1.5gpm Neoperl aerator	2	15	2	2	21	2.23	1.5
Retrofit with 1.0gpm Neoperl aerator	16	48	41	0	105	2.28	1.0
SHOWERS No Action	34	0	1	0	35	2.50	2.5
Retrofit with 1.75gpm AM Conservation Handheld Showerhead	0	5	1	0	6	2.50	1.75
Retrofit with 1.75gpm AM Conservation Showerhead	2	19	0	0	21	2.50	1.75
Four Station Water Fountain Replacements	15	0	0	0	15		

Table 6A.1 Water Conservation Scope of Work

Scope of Work:

Energy Savings Methodology and Results

This project will reduce the quantity of water consumed by sanitary water fixtures. Honeywell calculates water savings using the difference in measured baseline and post-installation flush volumes or flow rates for toilets, urinals, and faucets and the agreed upon number of uses per day. For purposes of analysis, all baseline toilets, urinals, and faucets found in the building are grouped together. For each group of fixture type, the toilet and urinal consumption is measured in units of gallons per flush and faucets measured in gallons per minute creating a statistically valid sample of fixtures.

After implementation of this project, a statistically valid sample of each group of sanitary fixtures will be measured. All measurements will be a one-time measurement for the post-installation performance. Measurements will be done similar to those in the baseline measurements.

Frequency of Use	=	Number of users x % year-round occupancy x fixture uses/day/person
Water Savings (gal/yr)	=	Frequency of Use x (Baseline – Estimated Flow Rate) (gpm or gpf per fixture) x days/year x % high-flow fixtures
Sink Energy Savings (MMbtu/yr)	=	Water Savings (gal/yr) x (T_{mixed} -T_{cold}) (°F) x (1 Btu/lb °F X 8.34 (lb/gal) x 1/boiler efficiency X 1 MMBtu/1,000,000Btu
Cost Savings ($/yr)	=	[Water Savings Toilets and Urinals + Water Savings Sinks] (kgal/yr) x [water rate + sewer rate] ($/kgal) + [(Sink Energy Savings (MMbtu/yr)] x Thermal Rate ($/MMbtu)]

Changes in Infrastructure

None.

Customer Support and Coordination with Utilities

Minimal coordination efforts will be needed to reduce or limit impact to building occupants.

Environmental Issues

Resource Use	Water savings will result from lower water flows through new fixtures.
Waste Production	Old fixtures will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 6B
Steam Traps

STEAM TRAPS

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
6B	Steam Traps				✓

Existing Conditions

At Windsor School, a total of 24 steam traps were identified (or estimated in inaccessible areas), during the preliminary audit and are recommended for replacement in this program. The buildings and quantities included in the project scope are:

School	Thermostatic	F&T or Bucket
Windsor	18	6

Table 6B.1 Steam Traps

For Windsor, we have estimated the steam losses in the attached table based on a conservative figure of 10% failed, 10% leaking steam trap population for a total failure rate of 20%. Failure rates are based on what has been found in similar schools elsewhere in the New York and New Jersey area.

Windsor Steam Radiator with Thermostatic Trap

Proposed Solution

Under the program, thermostatic traps will be rebuilt with Barnes and Jones Cage Units and have new covers installed, or be replaced with new thermostatic traps where rebuilds are not possible. All non-thermostatic traps will be replaced with equivalent Barnes and Jones (or equal) float and thermostatic (F&T) traps.

Thermostatic steam traps will be repaired with new Barnes and Jones (or equal units and covers. Procedure to repair a thermostatic steam traps includes removing the existing seat (if applicable), inspecting the existing seat for debris and/or deterioration, ensuring proper fit of new cage unit, application of anti-seize lubricant to threads on the new cover. Where it is not feasible to repair the trap, it will be completely replaced with a new thermostatic trap. F&T steam traps will include complete replacement with new steam traps manufactured by Barnes & Jones Inc. (or equal).

Changes in Infrastructure
None.

Customer Support and Coordination with Utilities
Minimal coordination efforts will be needed to reduce or limit impact to building occupants.

Environmental Issues

Resource Use	Fuel savings will result from lower Steam usage through new fixtures.
Waste Production	Old traps will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 7A
Computer Monitor Replacements

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
7A	Computer Monitor Replacements	✓	✓	✓	✓

Existing Conditions
Many of the computers throughout the district utilize CRT computer monitors. These computer monitors are used at almost every computer work station including the offices, computer labs, lounges, classrooms, etc.

These computer monitors are outdated and have several disadvantages such as; significantly increased energy consumption, large footprint, poor picture quality, distortions and flickering image, specular glare problems, high weight, and electromagnetic emissions.

Many of these drawbacks are difficult to quantify except for the energy use. CRT monitors use considerably more energy than an alternative flat panel LCD monitor. Replacement of the existing CRT monitors with LCD monitors saves considerable energy as well as provides other ergonomic benefits as well.

Proposed Solution

Monitor Upgrades
This ECM includes replacement of all existing CRT monitors with LCD flat panel monitors throughout the school. Installation costs were neglected for this ECM with the intention that this ECM would be performed by the school employees.

School	Computer Monitors
Robbinsville HS	133
Pond Road MS	139
Sharon ES	5
Windsor ES	152
TOTAL	**705**

Changes in Infrastructure
None

Customer Support and Coordination with Utilities
Minor IT support will be required for installation.

Environmental Issues

Resource Use	Energy savings will result from reduced energy.
Waste Production	None.
Environmental Regulations	No environmental impact is expected.

ECM 7B

Virtual Work Stations

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
7B	Virtual Work Stations	✓	✓	✓	✓

Existing Conditions

Robbinsville Schools currently operate with individual desk top computers for students. Energy consumption is a critical issue for IT organizations today, whether the goal is to reduce cost, environment stewardship or keep your datacenter running. In the United States alone, datacenters consumed $4.5 billion worth of electricity in 2006. Industry analyst Gartner1 estimates that over the next 5 years, most enterprise data centers will spend as much on energy (power and cooling) as they do on hardware infrastructure.

Pond Road MS - Computer Workstations

Sharon ES - Computer Workstations

Proposed Solution

Honeywell recommends implementation of virtual desktop interface (VDI) technology throughout the Robbinsville Public School district. VDI allows the user to have a computer interface where the operating system, all applications, and data are kept on central servers instead of the local workstation. The users access the data through dedicated "thin-clients", which would replace each of the existing workstations on a one for one basis. Thin clients use significantly less energy than traditional workstations and have a longer life-span of 6-10 years. Additionally, VDI centralizes IT maintenance functions to the data center where the VDI servers are located, thereby reducing IT Administration costs.

Scope of Work:

School	Work Stations	Base Unit	Thin Clients
Windsor ES	10	Dell PC 6248	10
Sharon ES	318	Dell PC 6248	318
Pond Road MS	309	Dell PC 6248	309
Robbinsville HS	327	Dell PC 6248	327

Installation costs were neglected for this ECM with the intention that this ECM would be performed by the school employees.

Notes:
System resource allocations based on 60 thin clients per VDI server.

Changes in Infrastructure
None

Customer Support and Coordination with Utilities
Minor IT support will be required for installation.

Environmental Issues

Resource Use	Energy savings will result from reduced energy.
Waste Production	None.
Environmental Regulations	No environmental impact is expected.

ECM 8A
Photovoltaic Array

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
6A	Photovoltaic Array	✓	✓	✓	

Solar Array:

Honeywell has prepared a solar evaluation of three schools in Robbinsville, NJ. These schools include:

- Sharon Road Elementary School (Rooftop Array)
- Pond Road Middle School (Rooftop and Ground Mount Arrays)
- Robbinsville High School (Rooftop Array).

The evaluation includes the preliminary design of a solar array for each of the four solar systems using internet based aerial photography. Honeywell then confirmed each preliminary design with a site visit to each of these sites to verify the data collected via the internet.

The basis of design for this evaluation included the following specifications. All systems were designed using a 240W solar module manufactured by LDK. The LDK module offers high efficiency and a product and power performance warranty that will provide more output then a similarly sized Sharp Module. For the mounting system we used the Solstice Mounting System which is locally manufactured here in NJ. The Solstice system was designed using a 10º tilt for rooftops and a 25º tilt for the ground mounted system; but once a structural analysis is completed we may be able to increase the rooftop tilt to 12º which will result in an increased solar output of about .75%. Honeywell has designed these systems using PV Powered inverters. These US manufactured inverters are high efficiency (97+%) and come with a 10 year warranty, which is twice as long as the leading competitors.

Solar Array Specifications:

Sharon Road Elementary School Rooftop Solar Array:
This system is broken into two sections due the physical layout of the schools. The total system size is 124.32 KW. Section One (left hand side) is 50.4 KW and Section Two (right hand side) is 73.92 KW. The projected output for this system in year one is 156,480 KWH.

Pond Road Middle School Rooftop Solar Array:
The total system size is 551.04 KW. The projected output for this system in year one is 681,825 KWH.

Pond Road Middle School Ground Mount Solar Array:
The total system size is 416.64 KW. The projected output for this system in year one is 561,965 KWH.

Robbinsville High School Rooftop Solar Array:
The total system size is 668.64 KW. The projected output for this system in year one is 834,317 KWH.

School	Type	System Size KW	Projected Output KWH
Sharon ES	Roof Mount	124.32	156,480
Pond Road MS	Roof Mount	551.04	681,825
Pond Road MS	Ground Mount	416.64	561,965
Robbinsville HS	Roof Mount	668.64	834,317

Table 8A.1 – Proposed Solar Array

Changes in Infrastructure
Solar arrays will be mounted on roofs and ground.

Customer Support and Coordination with Utilities
Minimal coordination efforts will be needed to reduce or limit impact to building occupants.

Environmental Issues

Resource Use	Electric cost savings will result from production of electricity from Solar energy.
Waste Production	None
Environmental Regulations	No environmental impact is expected.

ECM 9A
Demand Response

ECM	ECM Description	Robbinsville High School	Pond Middle School	Sharon Elementary School	Windsor Elementary School
9A	Demand Response	✓	✓	✓	

Overview

Honeywell proposes to utilize a registered Demand Response Curtailment Service Provider (CSP) to provide energy response services to the Robbinsville School District. Through the CSP, the Robbinsville-School District will participate in the PJM Capacity Market Program and PJM Energy Efficiency Program. These programs are offered through the PJM Regional Transmission Organization (RTO), and Independent System Operator (ISO). The Capacity Market Program allows PJM customers the ability to respond to capacity emergencies when called upon by PJM, and the energy efficiency program pays PJM customers for implementing Energy Conservation measures (ECMs) that result in permanent load reductions during defined hours.

Proposed System

Honeywell proposes to work with a PJM Regional Transmission Organization (RTO), CSR to implement a Demand Response energy curtailment program which will generate revenue streams for the District. The PJM programs offer the District the ability to respond to capacity emergencies when called upon by PJM, and benefit from permanent kW load reductions associated with implementing Energy Efficiency (EE) improvements. Honeywell's Demand Response agent acting as the CSP, will notify the district prior to potential events in order to advise and coordinate load curtailment participation in accordance with RTO program requirements, and will work with the District to benefit from EE Improvements. The PJM Markets are further described below.

PJM Capacity Market Program

Capacity represents the need to have adequate resources to ensure that the demand for electricity can be met at all times. For PJM, that means that a utility, other electricity supplier or load serving entity, is required to have the resources to meet its consumers' demands plus a reserve amount. Electricity suppliers, load serving entities, can meet that requirement by owning and operating generation capacity, by purchasing capacity from others or by obtaining capacity through PJM's capacity market auctions.

PJM operates a capacity market, called the Reliability Pricing Model (RPM). It is designed to ensure that adequate resources are available to meet the demand for electricity at all times. In the RPM, those resources include not only generating stations, but also demand response actions and energy efficiency measures by consumers to reduce their demand for electricity.

PJM must keep the electric grid operating in balance by ensuring there is adequate generation of electricity to satisfy the demand for electricity at every location in the region both now and in the future. PJM's markets for energy and ancillary services help maintain the balance now, while the PJM market for capacity aims to keep the system in balance in the future. Resources, even if they operate infrequently, must receive enough revenue to cover their costs. Payments for capacity provide a revenue stream to maintain and keep current resources operating and to develop new resources. Investors need sufficient long-term price signals to encourage the maintenance and development of generation, transmission and demand-side resources. The RPM, based on making capacity commitments in advance of the energy need, creates a long-term price signal to attract needed investments for reliability in the PJM region.

The PJM Energy Efficiency Program

Energy efficiency measures consist of installing more efficient devices or implementing more efficient processes/systems that exceed then-current building codes or other relevant standards. An energy efficiency resource must achieve a permanent, continuous reduction in demand for electricity. Energy efficiency measures are fully implemented throughout the delivery year without any requirement of notice, dispatch, or operator intervention. A demand response resource can reduce its demand for electricity when instructed; this means PJM considers it a "dispatchable resource". A demand response resource can participate in the RPM market for as long as its ability to reduce its demand continues. A demand response resource must be willing to reduce demand for electricity up to 10 times each year when called for a reduction. In a year without any reduction calls, the demand response resource is required to demonstrate the ability to reduce demand for electricity during a test of reduction capability. Data will be submitted by the demand response resource to prove compliance with reductions from actual calls or reductions from capability tests. An energy efficiency resource is one that reduced their demand for electricity through an energy efficiency measure that does not require any additional action by the consumer.

Scope of Work:

1. Coordinate with Demand Response Curtailment Service Provider (CSP) in order to select viable demand response resource loads. These loads will include non-critical electrical loads, which are generally energized when peak electrical grid conditions typically occur in the summer months. Final selection of sheddable loads shall be approved by the Robbinsville Public School District prior to implementation.
2. Develop a Demand Response Standard Operating Procedure (SOP) detailing actions to be taken in order to respond to a capacity emergency when called upon by PJM.

Identified sheddable load at Robbinsville High School:

Equipment Name	Unit No.		Model	HP	% Load	Eff	kW	Shed Method
Chilled Water Pumps	1	US Electric		25	50%	0.92	18.21308	De-energize at BMS
Chilled Water Pumps	2	US Electric		25	50%	0.92	18.21308	
Condenser Pumps	1	US Electric		25	50%	0.92	18.21308	
Condenser Pumps	2	US Electric		25	50%	0.92	18.21308	
Cooling Tower	1	BAC	3455A-2	20	50%	0.92	14.57046	
Cooling Tower	2	BAC	3455A-3	20	50%	0.92	14.57046	

Load	Estimated Lighting Intensity	Building Sq. Footage	Estimated % Lighting Shed	kW	Shed Method
Lighting	1 Watts/SF	221,457/SSF	50%	110.73	Wall Switch

Identified sheddable load at Pond Road Middle School:

Service	Type	Unit No.	Manufacturer	Model	EER	Kw/Ton	Tons'	kW	Shed Method
Admin Offices	RTU	A1	Trane	TCD-049	10.56	1.14	4	4.6	Global BMS Space Temperature Setpoint Adjustment
Admin Offices	RTU	A2	Trane	TCD-061	10.56	1.14	5	5.8	
Admin Offices	RTU	A3	Trane	TCD-049	10.56	1.14	4	4.6	
Admin Offices	RTU	A4	Trane	TCD-061	10.56	1.14	5	5.8	
Admin Offices	RTU	A5	Trane	TCD-049	10.56	1.14	4	4.6	
Admin Offices	RTU	A6	Trane	TCD-061	10.56	1.14	5	5.8	
Admin Offices	RTU	A7	Trane	TCD036	9.2	1.30	3	3.9	
Faculty Lounge	CU	B6	Trane	TTA048	10.56	1.14	4	4.5	
Music Offices	CU	B1	Trane	TTA030	10.56	1.14	3	2.8	
Music Practice Room	CU	B2	Trane	TTA042	10.56	1.14	4	4.0	
Music Room	CU	B3	York	EABCW060	10.56	1.14	5	5.7	
Stage	CU	B4	Trane	TTA120	8.46	1.42	10	14.2	
Stage	CU	B4(A)	Trane	TTA120	8.46	1.42	10	14.2	
Cafetorium	CU	B5	Trane	RAUCC604	8.46	1.42	5	7.1	
Maintenance Shop	AC-1			PTHB090	9.9	1.21	8	9.1	
Media Center	CU	C1	Trane	TTA090	7.68	1.56	7.5	11.7	
Media Center	CU	C1A	Trane	TTA090	7.68	1.56	7.5	11.7	
C-Wing Class Rooms	CU	C2	Trane	TTA150	7.68	1.56	12.5	19.5	
C-Wing Class Rooms	CU	C2A	Trane	TTA159	7.68	1.56	12.5	19.5	
Curriculum Library	CU	C4	Trane	TTA090	8.46	1.42	7.5	10.6	
Media Center	CU	C3	Trane	TTA060	8.46	1.42	5	7.1	
Unknown	CU	X	Trane	TTAD42C	8.46	1.42	3.5	5.0	
Science Lab Offices	CU	D9	Trane	TTA036	9.9	1.21	3	3.6	
Science Lab	CU	D5	York	HABAW060	8.46	1.42	5	7.1	
Art	CU	D6	Trane	TTA048	9.9	1.21	4	4.8	
Special Ed	CU	D10	Trane	TTA042	9.9	1.21	3.5	4.2	
Class room	CU	D2	Trane	TTA060	8.46	1.42	5	7.1	
Class room	CU	D3	Trane	TTA060	8.46	1.42	5	7.1	
Class room	CU	D4	Trane	TTA060	8.46	1.42	5	7.1	

Computer Lab	CU	D1	Trane	TTA090	8.46	1.42	7.5	10.6
Technology	CU	D1A	Trane	TTA090	8.46	1.42	7.5	10.6
Class room	CU	D4	Trane	TTA072	8.46	1.42	6	8.5
Class room	CU	XX	Trane	TTA072	8.46	1.42	6	8.5
Class room	CU	E1	Trane	TTA042	9.9	1.21	3.5	4.2
Class room	CU	E2	Trane	TTA042	9.9	1.21	3.5	4.2
Class room	CU	E3	Trane	TTA042	9.9	1.21	3.5	4.2
Class room	CU	E4	Trane	TTA042	9.9	1.21	3.5	4.2

Load	Estimated Lighting Intensity	Building Sq. Footage	Estimated % Lighting Shed	kW	Shed Method
Lighting	1 Watts/SF	150,000 SF	50%	75.00	Wall Switch

Identified sheddable load at Sharon Elementary School:

Service	Type	Unit No.	Manufacturer	Model	Tons'	kW	Shed Method
Admin Offices	CU		Mitsubishi	16 MCA	1.3	1.5	BMS Space Temperature Setpoint Adjustment
Multipurpose	CU		Trane	TTA120	10.0	12.1	
Media Center	CU		Trane	TTA180	15.0	17.5	
Corridor	CU		Trane	TTA060	10.0	12.0	
Computer Room	CU		Trane	GDC049	4.1	4.1	

Load	Estimated Lighting Intensity	Building Sq. Footage	Estimated % Lighting Shed	kW	Shed Method
Lighting	1 Watts/SF	78,800 SF	50%	39.40	Wall Switch

Identified sheddable load at Windsor Elementary School:

Load	Estimated Lighting Intensity	Building Sq. Footage	Estimated % Lighting Shed	kW	Shed Method
Lighting	1 Watts/SF	5,897 SF	50%	2.95	Wall Switch

Changes in Infrastructure

None

Customer Support and Coordination with Utilities

Customer will be trained on the Demand Response Standard Operating Procedure.

Environmental Issues

Resource Use	Revenue will result from participation in the PJM Capacity Market Program and PJM Energy Efficiency Program.
Waste Production	None.
Environmental Regulations	No environmental impact is expected.

SECTION C: Financial Analysis Overview

In the development of an Energy Savings Plan (ESP) in accordance with NJ PL2009, c.4, it is important to identify energy conservation measures (ECMs) that may be implemented now or at some point in the future. The law outlines the responsibility to identify the opportunities and then proceed forward based on the needs and requirements of the school district, while building a self funding comprehensive project. If an ECM is not identified as part of this ESP, it cannot be implemented as part of an Energy Savings Improvement Program (ESIP) without a board amended change to the ESP.

It is the intent of this financial analysis to identify ALL potential ECM's within the Robbinsville Public School District as part of a comprehensive ESP. This is not meant to infer that all of the ECM's identified must be, or based upon legislative requirements, can be implemented at this time. However, as long as the ECM is part of this plan, it may be implemented at a later date as additional funding becomes available or technology changes in order to provide an improved financial return.

Should the Board of Education adopt this ESP, the next step is to develop a priority list of ECM's complete with a financial return that meets the requirement of the law and satisfy's the energy and operational goals of your district.

A collaborative Project Development Agreement (PDA) between Honeywell and the Robbinsville Public School District will be developed to establish the minimum criteria for the project as well as outline a specific timeline to implement the program.

We have organized your financial options in the following spreadsheets. These options are for comparative purposes only and the final project implemented within the district will remain a collaborative effort of the District with Honeywell's input. The requirement of the law is to implement a combined project that is self-funding within a 15 year term.

ECM Summary
ECM Summary is an overview of the projects identified by ECM with cost and savings per project. It is important to understand that economies can be achieved by combining projects; however for the purpose of clarity we have separated each. The samples provided are organized in the following format:

- **Building by Building ECM Summary**
- **District-Wide All ECM Summary**
- **Sample Project No.1 ECM Summary w/o Capital Cost Avoidance**
- **Sample Project No.2 ECM Summary w/ Capital Cost Avoidance**

Financial Cash Flow

We have provided a 15 year cash flow example based on level payments with the costs, savings and financing for the sample projects identified in this plan. As ECM's are prioritized, selected and projects are combined, this cash flow will change with your final project. A financing structure may also be considered to more closely align the annual savings / revenues with the annual costs over the term of the agreement.

We have included samples in the following format:

- **Sample Project No.1 Cash Flow (w/o Capital Cost Avoidance)**
- **Sample Project No.2 Cash Flow (w/ Capital Cost Avoidance)**

Energy Savings Guarantee

Under this legislation, Honeywell is obligated to identify the potential annual cost associated with an Energy Savings Guarantee. In accordance with Honeywell's response to "The Robbinsville Public School Districts Request for Proposals to Select Energy Services Company to Perform Self Funded Energy Efficiency Improvements" dated March 1, 2012, the annual cost to provide a Savings Guarantee was identified as 1% of Hard Costs.

Considering that all ECMs are not likely to be implemented based on the payback requirement outlined in the legislation, we anticipate the annual guarantee amount to be in the $20,000 - $30,000 range. An exact cost will be provided once the School District selects the projects to be implemented.

In accordance with the legislation, this guarantee is optional and at the sole discretion of the School District.

Robbinsville Public School District
Building by Building ECM Summary

Building	Hard Cost	ESCO Fee	A&E Fee	Rebates	Net Cost	Annual Energy Cost Savings	Annual Operational & SREC Savings	Capital Cost Avoidance	Simple Payback
Robbinsville HS	**$ 2,743,275**	**$ 864,132**	**$ 205,065**	**$ 177,634**	**$ 3,634,838**	**$ 202,243**	**$ 1,106**	**$ -**	**17.9**
Rebates		$ -	$ -	$ 177,634	$ (177,634)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 179,493	$ 56,540	$ 13,462		$ 249,496	$ 21,976	$ 1,106	$ -	10.8
1B De-stratification Fans	$ 46,695	$ 14,709	$ 3,502		$ 64,906	$ 10,418	$ -	$ -	6.2
1C Vending Misers	$ 2,400	$ 756	$ 180		$ 3,336	$ 1,352		$ -	2.5
2D Kitchen Hood Controls	$ 41,332	$ 13,020	$ 3,100		$ 57,452	$ 844	$ -	$ -	68.0
2E Refrigeration/Freezer Controls	$ 1,996	$ 629	$ 150		$ 2,774	$ 435	$ -	$ -	6.4
2F Solar Thermal DHW	$ 64,103	$ 20,192	$ 4,808		$ 89,103	$ 1,001	$ -	$ -	89.1
3A Building Management System Upgrades	$ 22,700	$ 7,151	$ 1,022		$ 30,872	$ 16,104	$ -	$ -	1.9
3B Demand Control Ventilation	$ 9,000	$ 2,835	$ 675		$ 12,510	$ 4,328	$ -	$ -	2.9
4A Building Envelope Improvements	$ 22,694	$ 7,149	$ 1,702		$ 31,545	$ 3,968	$ -	$ -	8.0
5A Power Factor Optimization (kW)	$ 19,000	$ 5,985	$ 1,425		$ 26,410	$ 2,629	$ -	$ -	10.0
5B Transformers	$ 99,222	$ 31,255	$ 7,442		$ 137,919	$ 12,656	$ -	$ -	10.9
6A Water Conservation	$ 5,952	$ 1,875	$ 446		$ 8,273	$ 2,712	$ -	$ -	3.1
7A Computer Monitor Replacements	$ 15,960	$ 5,027	$ 1,197		$ 22,184	$ 909	$ -	$ -	24.4
7B Virtual IT Work Stations	$ 180,062	$ 56,720	$ 13,505		$ 250,287	$ 3,332	$ -	$ -	75.1
8A Photovoltaic Array	$ 2,032,666	$ 640,290	$ 152,450		$ 2,825,406	$ 110,871	$ -	$ -	25.5
9A Demand Response		$ -	$ -		$ -	$ 8,708	$ -	$ -	0.0
Pond MS	**$ 5,366,466**	**$ 1,690,437**	**$ 389,778**	**$ 172,120**	**$ 7,274,561**	**$ 263,637**	**$ 10,919**	**$ -**	**26.5**
Rebates		$ -	$ -	$ 172,120	$ (172,120)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 244,672	$ 77,072	$ 18,350		$ 340,095	$ 25,424	$ 1,844	$ -	12.5
1B De-stratification Fans	$ 20,340	$ 6,407	$ 1,526		$ 28,273	$ 1,646	$ -	$ -	17.2
1C Vending Misers	$ 800	$ 252	$ 60		$ 1,112	$ 330		$ -	3.4
2A Boiler Replacements	$ 293,882	$ 92,573	$ 22,041		$ 408,496	$ 7,678	$ 1,000	$ -	47.1
2B DHW Boiler Replacments	$ 42,825	$ 13,490	$ 3,212		$ 59,527	$ 675	$ -	$ -	88.2
2C Boiler Burner Controls	$ 21,711	$ 6,839	$ 1,628		$ 30,178	$ 1,921	$ -	$ -	15.7
2D Kitchen Hood Controls	$ 20,663	$ 6,509	$ 1,550		$ 28,721	$ 612	$ -	$ -	46.9
2E Refrigeration/Freezer Controls	$ 1,996	$ 629	$ 150		$ 2,774	$ 262	$ -	$ -	10.6
3A Building Management System Upgrades	$ 423,560	$ 133,421	$ 19,060		$ 576,042	$ 13,362	$ 7,075	$ -	28.2
3B Demand Control Ventilation	$ 6,000	$ 1,890	$ 450		$ 8,340	$ 1,662	$ -	$ -	5.0
4A Building Envelope Improvements	$ 77,003	$ 24,256	$ 5,775		$ 107,034	$ 6,977	$ -	$ -	15.3
4B Roof Replacements	$ 904,000	$ 284,760	$ 67,800		$ 1,256,560	$ 16,336	$ -	$ -	76.9
5A Power Factor Optimization (kW)	$ 16,000	$ 5,040	$ 1,200		$ 22,240	$ 1,583	$ -	$ -	14.0
5B Transformers	$ 68,090	$ 21,448	$ 5,107		$ 94,645	$ 7,107	$ -	$ -	13.3
5C Install Premium Efficient Motors and VFDs	$ 12,375	$ 3,898	$ 928		$ 17,201	$ 1,461	$ -	$ -	11.8
6A Water Conservation	$ 6,153	$ 1,938	$ 461		$ 8,553	$ 1,577	$ 1,000	$ -	3.3
7A Computer Monitor Replacements	$ 16,680	$ 5,254	$ 1,251		$ 23,185	$ 980	$ -	$ -	23.6
7B Virtual IT Work Stations	$ 170,151	$ 53,597	$ 12,761		$ 236,509	$ 3,235	$ -	$ -	73.1
8A Photovoltaic Array	$ 3,019,565	$ 951,163	$ 226,467		$ 4,197,195	$ 165,566	$ -	$ -	25.4
9A Demand Response		$ -	$ -		$ -	$ 5,243	$ -	$ -	0.0
Windsor ES	**$ 60,768**	**$ 19,142**	**$ 4,351**	**$ 11,441**	**$ 72,820**	**$ 8,002**	**$ 233**	**$ -**	**8.8**
Rebates		$ -	$ -	$ 11,441	$ (11,441)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 9,302	$ 2,930	$ 698		$ 12,930	$ 1,024	$ 33	$ -	12.2
2A Boiler Replacements	$ 21,915	$ 6,903	$ 1,644		$ 30,462	$ 2,149	$ 200	$ -	13.0
3A Building Management System Upgrades	$ 6,900	$ 2,173	$ 310		$ 9,384	$ 607	$ -	$ -	15.5
4A Building Envelope Improvements	$ 3,280	$ 1,033	$ 246		$ 4,559	$ 1,183	$ -	$ -	3.9
6A Water Conservation	$ 3,748	$ 1,180	$ 281		$ 5,209	$ 120	$ -	$ -	43.4
6B Steam Trap Replacements	$ 9,517	$ 2,998	$ 714		$ 13,229	$ 2,693	$ -	$ -	4.9

Robbinsville Public School District
Building by Building ECM Summary

7A Computer Monitor Replacements	$ 600	$ 189	$ 45		$ 834	$ 43	$ -	$ -	19.6
7B Virtual IT Work Stations	$ 5,506	$ 1,735	$ 413		$ 7,654	$ 88	$ -	$ -	86.5
9A Demand Response		$ -	$ -		$ -	$ 96	$ -	$ -	0.0
Sharon ES	**$ 2,573,306**	**$ 810,591**	**$ 182,135**	**$ 59,641**	**$ 3,506,391**	**$ 58,093**	**$ 9,889**	**$ -**	**51.6**
Rebates		$ -	$ -	$ 59,641	$ (59,641)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 111,456	$ 35,109	$ 8,359		$ 154,924	$ 10,099	$ 723	$ -	14.3
1B De-stratification Fans	$ 18,820	$ 5,928	$ 1,412		$ 26,160	$ 2,249	$ -	$ -	11.6
1C Vending Misers	$ 400	$ 126	$ 30		$ 556	$ 264		$ -	2.1
2A Boiler Replacements	$ 246,070	$ 77,512	$ 18,455		$ 342,037	$ 4,631	$ 1,500	$ -	55.8
2B DHW Boiler Replacments	$ 17,110	$ 5,390	$ 1,283		$ 23,783	$ 339	$ -	$ -	70.2
2G RTU Cooling	$ 889,000	$ 280,035	$ 66,675		$ 1,235,710	$ (13,225)	$ -	$ -	0.0
3A Building Management System Upgrades - Old Section	$ 223,080	$ 70,270	$ 10,039		$ 303,389	$ 6,073	$ 7,666	$ -	22.1
3A Building Management System Upgrades - New Section	$ 139,020	$ 43,791	$ 6,256		$ 189,067	$ 675	$ -	$ -	280.2
3B Demand Control Ventilation	$ 3,000	$ 945	$ 225		$ 4,170	$ 571	$ -	$ -	7.3
4A Building Envelope Improvements	$ 73,997	$ 23,309	$ 5,550		$ 102,856	$ 5,564	$ -	$ -	18.5
4C Window Replacements	$ 122,677	$ 38,643	$ 9,201		$ 170,521	$ 1,548		$ -	110.2
4D Door Replacements	$ 17,000	$ 5,355	$ 1,275		$ 23,630	$ 852		$ -	27.8
5A Power Factor Optimization (kW)	$ 11,800	$ 3,717	$ 885		$ 16,402	$ 851	$ -	$ -	19.3
5B Transformers	$ 31,034	$ 9,776	$ 2,328		$ 43,137	$ 4,492	$ -	$ -	9.6
5C Install Premium Efficient Motors and VFDs	$ 22,275	$ 7,017	$ 1,671		$ 30,962	$ 2,555	$ -	$ -	12.1
6A Water Conservation	$ 15,615	$ 4,919	$ 1,171		$ 21,704	$ 2,382	$ -	$ -	9.1
7A Computer Monitor Replacements	$ 18,240	$ 5,746	$ 1,368		$ 25,354	$ 1,063	$ -	$ -	23.9
7B Virtual IT Work Stations	$ 175,107	$ 55,159	$ 13,133		$ 243,398	$ 3,216	$ -	$ -	75.7
8A Photovoltaic Array	$ 437,606	$ 137,846	$ 32,820		$ 608,272	$ 21,079	$ -	$ -	28.9
9A Demand Response		$ -	$ -		$ -	$ 2,818	$ -	$ -	0.0
School District Total	**$ 10,743,816**	**$ 3,384,302**	**$ 781,328**	**$ 420,836**	**$ 14,488,610**	**$ 531,976**	**$ 22,147**	**$ -**	**26.1**

Revision No.1

Robbinsville Public School District
District Wide All ECM Summary

Building	Hard Cost	ESCO Fee	A&E Fee	Rebates	Net Cost	Annual Energy Cost Savings	Annual Operational & SREC Savings	Capital Cost Avoidance	Simple Payback
Rebates		$ -	$ -	$ 420,836	$ (420,836)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 544,924	$ 171,651	$ 40,869		$ 757,444	$ 58,522	$ 3,706	$ -	12.2
1B De-stratification Fans	$ 85,855	$ 27,044	$ 6,439		$ 119,338	$ 14,313	$ -	$ -	8.3
1C Vending Misers	$ 3,600	$ 1,134	$ 270		$ 5,004	$ 1,946		$ -	2.6
2A Boiler Replacements	$ 561,867	$ 176,988	$ 42,140		$ 780,995	$ 14,458	$ 2,700	$ -	45.5
2B DHW Boiler Replacments	$ 59,935	$ 18,880	$ 4,495		$ 83,310	$ 1,013	$ -	$ -	82.2
2C Boiler Burner Controls	$ 21,711	$ 6,839	$ 1,628		$ 30,178	$ 1,921	$ -	$ -	15.7
2D Kitchen Hood Controls	$ 61,995	$ 19,528	$ 4,650		$ 86,173	$ 1,456	$ -	$ -	59.2
2E Refrigeration/Freezer Controls	$ 3,992	$ 1,257	$ 299		$ 5,549	$ 698	$ -	$ -	8.0
2F Solar Thermal DHW	$ 64,103	$ 20,192	$ 4,808		$ 89,103	$ 1,001	$ -	$ -	89.1
2G RTU Cooling	$ 889,000	$ 280,035	$ 66,675		$ 1,235,710	$ (13,225)	$ -	$ -	0.0
3A Building Management System Upgrades	$ 453,160	$ 142,745	$ 20,392		$ 616,298	$ 30,073	$ 7,075	$ -	16.6
3A Building Management System Upgrades - Old Section	$ 223,080	$ 70,270	$ 10,039		$ 303,389	$ 6,073	$ 7,666	$ -	22.1
3A Building Management System Upgrades - New Section	$ 139,020	$ 43,791	$ 6,256		$ 189,067	$ 675	$ -	$ -	280.2
3B Demand Control Ventilation	$ 18,000	$ 5,670	$ 1,350		$ 25,020	$ 6,561	$ -	$ -	3.8
4A Building Envelope Improvements	$ 176,974	$ 55,747	$ 13,273		$ 245,994	$ 17,692	$ -	$ -	13.9
4B Roof Replacements	$ 904,000	$ 284,760	$ 67,800		$ 1,256,560	$ 16,336	$ -	$ -	76.9
4C Window Replacements	$ 122,677	$ 38,643	$ 9,201		$ 170,521	$ 1,548		$ -	110.2
4D Door Replacements	$ 17,000	$ 5,355	$ 1,275		$ 23,630	$ 852		$ -	27.8
5A Power Factor Optimization (kW)	$ 46,800	$ 14,742	$ 3,510		$ 65,052	$ 5,063	$ -	$ -	12.8
5B Transformers	$ 198,346	$ 62,479	$ 14,876		$ 275,701	$ 24,255	$ -	$ -	11.4
5C Install Premium Efficient Motors and VFDs	$ 34,650	$ 10,915	$ 2,599		$ 48,164	$ 4,017	$ -	$ -	12.0
6A Water Conservation	$ 31,467	$ 9,912	$ 2,360		$ 43,739	$ 6,791	$ 1,000	$ -	5.6
6B Steam Trap Replacements	$ 9,517	$ 2,998	$ 714		$ 13,229	$ 2,693	$ -	$ -	4.9
7A Computer Monitor Replacements	$ 51,480	$ 16,216	$ 3,861		$ 71,557	$ 2,995	$ -	$ -	23.9
7B Virtual IT Work Stations	$ 530,826	$ 167,210	$ 39,812		$ 737,848	$ 9,871	$ -	$ -	74.8
8A Photovoltaic Array	$ 5,489,837	$ 1,729,299	$ 411,738		$ 7,630,873	$ 297,516	$ -	$ -	25.6
9A Demand Response		$ -	$ -		$ -	$ 16,865	$ -	$ -	0.0
School District Total	$ 10,743,816	$ 3,384,302	$ 781,328	$ 420,836	$ 14,488,610	$ 531,976	$ 22,147	$ -	26.1

Revision No.1

Robbinsville Public School District
Sample Project No.1
No Capital Cost Avoidance

Building	Hard Cost	ESCO Fee	A&E Fee	Rebates	Net Cost	Annual Energy Cost Savings	Annual Operational & SREC Savings	Capital Cost Avoidance	Simple Payback
Robbinsville HS	**$ 409,152**	**$ 128,883**	**$ 30,005**	**$ 177,634**	**$ 390,407**	**$ 85,286**	**$ 1,106**	**$ -**	**4.5**
Rebates		$ -	$ -	$ 177,634	$ (177,634)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 179,493	$ 56,540	$ 13,462		$ 249,496	$ 21,976	$ 1,106	$ -	10.8
1B De-stratification Fans	$ 46,695	$ 14,709	$ 3,502		$ 64,906	$ 10,418	$ -	$ -	6.2
1C Vending Misers	$ 2,400	$ 756	$ 180		$ 3,336	$ 1,352		$ -	2.5
2E Refrigeration/Freezer Controls	$ 1,996	$ 629	$ 150		$ 2,774	$ 435	$ -	$ -	6.4
3A Building Management System Upgrades	$ 22,700	$ 7,151	$ 1,022		$ 30,872	$ 16,104	$ -	$ -	1.9
3B Demand Control Ventilation	$ 9,000	$ 2,835	$ 675		$ 12,510	$ 4,328	$ -	$ -	2.9
4A Building Envelope Improvements	$ 22,694	$ 7,149	$ 1,702		$ 31,545	$ 3,968	$ -	$ -	8.0
5A Power Factor Optimization (kW)	$ 19,000	$ 5,985	$ 1,425		$ 26,410	$ 2,629	$ -	$ -	10.0
5B Transformers	$ 99,222	$ 31,255	$ 7,442		$ 137,919	$ 12,656	$ -	$ -	10.9
6A Water Conservation	$ 5,952	$ 1,875	$ 446		$ 8,273	$ 2,712	$ -	$ -	3.1
9A Demand Response		$ -	$ -		$ -	$ 8,708	$ -	$ -	0.0
Pond MS	**$ 1,150,531**	**$ 362,417**	**$ 73,583**	**$ 172,120**	**$ 1,414,412**	**$ 72,667**	**$ 10,919**	**$ -**	**16.9**
Rebates		$ -	$ -	$ 172,120	$ (172,120)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 244,672	$ 77,072	$ 18,350		$ 340,095	$ 25,424	$ 1,844	$ -	12.5
1C Vending Misers	$ 800	$ 252	$ 60		$ 1,112	$ 330		$ -	3.4
2A Boiler Replacements	$ 293,882	$ 92,573	$ 22,041		$ 408,496	$ 7,678	$ 1,000	$ -	47.1
2E Refrigeration/Freezer Controls	$ 1,996	$ 629	$ 150		$ 2,774	$ 262	$ -	$ -	10.6
3A Building Management System Upgrades	$ 423,560	$ 133,421	$ 19,060		$ 576,042	$ 13,362	$ 7,075	$ -	28.2
3B Demand Control Ventilation	$ 6,000	$ 1,890	$ 450		$ 8,340	$ 1,662	$ -	$ -	5.0
4A Building Envelope Improvements	$ 77,003	$ 24,256	$ 5,775		$ 107,034	$ 6,977	$ -	$ -	15.3
5A Power Factor Optimization (kW)	$ 16,000	$ 5,040	$ 1,200		$ 22,240	$ 1,583	$ -	$ -	14.0
5B Transformers	$ 68,090	$ 21,448	$ 5,107		$ 94,645	$ 7,107	$ -	$ -	13.3
5C Install Premium Efficient Motors and VFDs	$ 12,375	$ 3,898	$ 928		$ 17,201	$ 1,461	$ -	$ -	11.8
6A Water Conservation	$ 6,153	$ 1,938	$ 461		$ 8,553	$ 1,577	$ 1,000	$ -	3.3
9A Demand Response		$ -	$ -		$ -	$ 5,243	$ -	$ -	0.0
Windsor ES	**$ 54,662**	**$ 17,219**	**$ 3,893**	**$ 11,441**	**$ 64,332**	**$ 7,871**	**$ 233**	**$ -**	**7.9**
Rebates		$ -	$ -	$ 11,441	$ (11,441)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 9,302	$ 2,930	$ 698		$ 12,930	$ 1,024	$ 33	$ -	12.2
2A Boiler Replacements	$ 21,915	$ 6,903	$ 1,644		$ 30,462	$ 2,149	$ 200	$ -	13.0
3A Building Management System Upgrades	$ 6,900	$ 2,173	$ 310		$ 9,384	$ 607	$ -	$ -	15.5
4A Building Envelope Improvements	$ 3,280	$ 1,033	$ 246		$ 4,559	$ 1,183	$ -	$ -	3.9
6A Water Conservation	$ 3,748	$ 1,180	$ 281		$ 5,209	$ 120	$ -	$ -	43.4
6B Steam Trap Replacements	$ 9,517	$ 2,998	$ 714		$ 13,229	$ 2,693	$ -	$ -	4.9
9A Demand Response		$ -	$ -		$ -	$ 96	$ -	$ -	0.0
Sharon ES	**$ 896,566**	**$ 282,418**	**$ 56,379**	**$ 59,641**	**$ 1,175,723**	**$ 43,223**	**$ 9,889**	**$ -**	**22.1**
Rebates		$ -	$ -	$ 59,641	$ (59,641)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 111,456	$ 35,109	$ 8,359		$ 154,924	$ 10,099	$ 723	$ -	14.3
1B De-stratification Fans	$ 18,820	$ 5,928	$ 1,412		$ 26,160	$ 2,249	$ -	$ -	11.6
1C Vending Misers	$ 400	$ 126	$ 30		$ 556	$ 264		$ -	2.1
2A Boiler Replacements	$ 246,070	$ 77,512	$ 18,455		$ 342,037	$ 4,631	$ 1,500	$ -	55.8
3A Building Management System Upgrades - Old Section	$ 223,080	$ 70,270	$ 10,039		$ 303,389	$ 6,073	$ 7,666	$ -	22.1
3A Building Management System Upgrades - New Section	$ 139,020	$ 43,791	$ 6,256		$ 189,067	$ 675	$ -	$ -	280.2
3B Demand Control Ventilation	$ 3,000	$ 945	$ 225		$ 4,170	$ 571	$ -	$ -	7.3
4A Building Envelope Improvements	$ 73,997	$ 23,309	$ 5,550		$ 102,856	$ 5,564	$ -	$ -	18.5
5A Power Factor Optimization (kW)	$ 11,800	$ 3,717	$ 885		$ 16,402	$ 851	$ -	$ -	19.3
5B Transformers	$ 31,034	$ 9,776	$ 2,328		$ 43,137	$ 4,492	$ -	$ -	9.6
5C Install Premium Efficient Motors and VFDs	$ 22,275	$ 7,017	$ 1,671		$ 30,962	$ 2,555	$ -	$ -	12.1
6A Water Conservation	$ 15,615	$ 4,919	$ 1,171		$ 21,704	$ 2,382	$ -	$ -	9.1
9A Demand Response		$ -	$ -		$ -	$ 2,818	$ -	$ -	0.0
School District Total	**$ 2,510,912**	**$ 790,937**	**$ 163,861**	**$ 420,836**	**$ 3,044,874**	**$ 209,047**	**$ 22,147**	**$ -**	**13.2**

Robbinsville Public School District
Sample Project No.2
Pond MS Roof w/ Capital Cost Avoidance

Building	Hard Cost	ESCO Fee	A&E Fee	Rebates	Net Cost	Annual Energy Cost Savings	Annual Operational & SREC Savings	Capital Cost Avoidance	Simple Payback
Robbinsville HS	**$ 409,152**	**$ 128,883**	**$ 30,005**	**$ 177,634**	**$ 390,407**	**$ 85,286**	**$ 1,106**	**$ -**	**4.5**
Rebates		$ -	$ -	$ 177,634	$ (177,634)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 179,493	$ 56,540	$ 13,462		$ 249,496	$ 21,976	$ 1,106	$ -	10.8
1B De-stratification Fans	$ 46,695	$ 14,709	$ 3,502		$ 64,906	$ 10,418	$ -	$ -	6.2
1C Vending Misers	$ 2,400	$ 756	$ 180		$ 3,336	$ 1,352		$ -	2.5
2E Refrigeration/Freezer Controls	$ 1,996	$ 629	$ 150		$ 2,774	$ 435	$ -	$ -	6.4
3A Building Management System Upgrades	$ 22,700	$ 7,151	$ 1,022		$ 30,872	$ 16,104	$ -	$ -	1.9
3B Demand Control Ventilation	$ 9,000	$ 2,835	$ 675		$ 12,510	$ 4,328	$ -	$ -	2.9
4A Building Envelope Improvements	$ 22,694	$ 7,149	$ 1,702		$ 31,545	$ 3,968	$ -	$ -	8.0
5A Power Factor Optimization (kW)	$ 19,000	$ 5,985	$ 1,425		$ 26,410	$ 2,629	$ -	$ -	10.0
5B Transformers	$ 99,222	$ 31,255	$ 7,442		$ 137,919	$ 12,656	$ -	$ -	10.9
6A Water Conservation	$ 5,952	$ 1,875	$ 446		$ 8,273	$ 2,712	$ -	$ -	3.1
9A Demand Response		$ -	$ -		$ -	$ 8,708	$ -	$ -	0.0
Pond MS	**$ 1,760,649**	**$ 554,605**	**$ 119,342**	**$ 172,120**	**$ 2,262,476**	**$ 81,324**	**$ 9,919**	**$ 27,943**	**19.0**
Rebates		$ -	$ -	$ 172,120	$ (172,120)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 244,672	$ 77,072	$ 18,350		$ 340,095	$ 25,424	$ 1,844	$ -	12.5
1C Vending Misers	$ 800	$ 252	$ 60		$ 1,112	$ 330		$ -	3.4
2E Refrigeration/Freezer Controls	$ 1,996	$ 629	$ 150		$ 2,774	$ 262	$ -	$ -	10.6
3A Building Management System Upgrades	$ 423,560	$ 133,421	$ 19,060		$ 576,042	$ 13,362	$ 7,075	$ -	28.2
3B Demand Control Ventilation	$ 6,000	$ 1,890	$ 450		$ 8,340	$ 1,662	$ -	$ -	5.0
4A Building Envelope Improvements	$ 77,003	$ 24,256	$ 5,775		$ 107,034	$ 6,977	$ -	$ -	15.3
4B Roof Replacements	$ 904,000	$ 284,760	$ 67,800		$ 1,256,560	$ 16,336	$ -	$ 27,943	28.4
5A Power Factor Optimization (kW)	$ 16,000	$ 5,040	$ 1,200		$ 22,240	$ 1,583	$ -	$ -	14.0
5B Transformers	$ 68,090	$ 21,448	$ 5,107		$ 94,645	$ 7,107	$ -	$ -	13.3
5C Install Premium Efficient Motors and VFDs	$ 12,375	$ 3,898	$ 928		$ 17,201	$ 1,461	$ -	$ -	11.8
6A Water Conservation	$ 6,153	$ 1,938	$ 461		$ 8,553	$ 1,577	$ 1,000	$ -	3.3
9A Demand Response		$ -	$ -		$ -	$ 5,243	$ -	$ -	0.0
Windsor ES	**$ 54,662**	**$ 17,219**	**$ 3,893**	**$ 11,441**	**$ 64,332**	**$ 7,871**	**$ 233**	**$ -**	**7.9**
Rebates		$ -	$ -	$ 11,441	$ (11,441)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 9,302	$ 2,930	$ 698		$ 12,930	$ 1,024	$ 33	$ -	12.2
2A Boiler Replacements	$ 21,915	$ 6,903	$ 1,644		$ 30,462	$ 2,149	$ 200	$ -	13.0
3A Building Management System Upgrades	$ 6,900	$ 2,173	$ 310		$ 9,384	$ 607	$ -	$ -	15.5
4A Building Envelope Improvements	$ 3,280	$ 1,033	$ 246		$ 4,559	$ 1,183	$ -	$ -	3.9
6A Water Conservation	$ 3,748	$ 1,180	$ 281		$ 5,209	$ 120	$ -	$ -	43.4
6B Steam Trap Replacements	$ 9,517	$ 2,998	$ 714		$ 13,229	$ 2,693	$ -	$ -	4.9
9A Demand Response		$ -	$ -		$ -	$ 96	$ -	$ -	0.0
Sharon ES	**$ 757,546**	**$ 238,627**	**$ 50,124**	**$ 59,641**	**$ 986,656**	**$ 42,549**	**$ 9,889**	**$ -**	**18.8**
Rebates		$ -	$ -	$ 59,641	$ (59,641)	$ 0		$ -	0.0
1A Lighting Retrofit and Motion Sensors	$ 111,456	$ 35,109	$ 8,359		$ 154,924	$ 10,099	$ 723	$ -	14.3
1B De-stratification Fans	$ 18,820	$ 5,928	$ 1,412		$ 26,160	$ 2,249	$ -	$ -	11.6
1C Vending Misers	$ 400	$ 126	$ 30		$ 556	$ 264		$ -	2.1
2A Boiler Replacements	$ 246,070	$ 77,512	$ 18,455		$ 342,037	$ 4,631	$ 1,500	$ -	55.8
3A Building Management System Upgrades - Old Section	$ 223,080	$ 70,270	$ 10,039		$ 303,389	$ 6,073	$ 7,666	$ -	22.1
3B Demand Control Ventilation	$ 3,000	$ 945	$ 225		$ 4,170	$ 571	$ -	$ -	7.3
4A Building Envelope Improvements	$ 73,997	$ 23,309	$ 5,550		$ 102,856	$ 5,564	$ -	$ -	18.5
5A Power Factor Optimization (kW)	$ 11,800	$ 3,717	$ 885		$ 16,402	$ 851	$ -	$ -	19.3
5B Transformers	$ 31,034	$ 9,776	$ 2,328		$ 43,137	$ 4,492	$ -	$ -	9.6
5C Install Premium Efficient Motors and VFDs	$ 22,275	$ 7,017	$ 1,671		$ 30,962	$ 2,555	$ -	$ -	12.1
6A Water Conservation	$ 15,615	$ 4,919	$ 1,171		$ 21,704	$ 2,382	$ -	$ -	9.1
9A Demand Response		$ -	$ -		$ -	$ 2,818	$ -	$ -	0.0
School District Total	**$ 2,982,010**	**$ 939,333**	**$ 203,364**	**$ 420,836**	**$ 3,703,871**	**$ 217,030**	**$ 21,147**	**$ 27,943**	**13.9**

Robbinsville School District

Sample Project No.1 Cash Flow - All Boilers & Controls (No Roof)

Capital Cost	**$3,465,709**
Interest Rate	**3.00%**
Term of Agreement	**15**
Electric Escalation Rate	**2.20%**
Gas Esclation Rate	**2.40%**
Water Esclation Rate	**2.20%**
Net Present Value	**$92,982**
Capital Cost Avoidance	**$0**

Year	Annual Energy Savings	Annual Operational Savings	Capital Cost Avoidance	Energy Rebate / PJM	Total Savings / Revenue	Annual Costs	Cash Flow
Installation	$0			$47,146	$47,146	$0	$47,146
1	$209,047	$23,147	$0	$186,845	$419,038	$287,203	$131,836
2	$213,768	$23,656	$0	$186,845	$424,269	$287,203	$137,066
3	$218,471	$24,176	$0	$0	$242,647	$287,203	($44,556)
4	$223,277	$24,708	$0	$0	$247,985	$287,203	($39,218)
5	$228,189	$24,165	$0	$0	$252,354	$287,203	($34,849)
6	$233,209	$23,633	$0	$0	$256,842	$287,203	($30,361)
7	$238,340	$23,113	$0	$0	$261,453	$287,203	($25,750)
8	$243,583	$22,604	$0	$0	$266,188	$287,203	($21,015)
9	$248,942	$22,107	$0	$0	$271,049	$287,203	($16,153)
10	$254,419	$21,621	$0	$0	$276,040	$287,203	($11,163)
11	$260,016	$21,145	$0	$0	$281,161	$287,203	($6,041)
12	$265,736	$20,680	$0	$0	$286,416	$287,203	($786)
13	$271,583	$20,225	$0	$0	$291,808	$287,203	$4,605
14	$277,557	$19,780	$0	$0	$297,338	$287,203	$10,135
15	$283,664	$19,345	$0	$0	$303,009	$287,203	$15,806
Totals	**$3,669,801**	**$334,105**	**$0**	**$420,836**	**$4,424,741**	**$4,308,040**	**$116,702**

Robbinsville School District

Sample Project No.2 Cash Flow - Pond MS Foam Roof

Capital Cost	**$4,124,706**
Interest Rate	**3.00%**
Term of Agreement	**15**
Electric Escalation Rate	**2.20%**
Gas Esclation Rate	**2.40%**
Water Esclation Rate	**2.20%**
Net Present Value	**-$8,382**
Capital Cost Avoidance	**$38,442**

Year	Annual Energy Savings	Annual Operational Savings	Capital Cost Avoidance	Energy Rebate / PJM	Total Savings / Revenue	Annual Costs	Cash Flow
Installation	$0			$47,146	$47,146	$0	$47,146
1	$217,030	$22,147	$38,442	$186,845	$464,464	$341,814	$122,650
2	$221,938	$22,634	$38,442	$186,845	$469,860	$341,814	$128,046
3	$226,821	$23,132	$38,442	$0	$288,395	$341,814	($53,418)
4	$231,811	$23,641	$38,442	$0	$293,894	$341,814	($47,919)
5	$236,911	$23,121	$38,442	$0	$298,474	$341,814	($43,340)
6	$242,123	$22,612	$38,442	$0	$303,177	$341,814	($38,636)
7	$247,450	$22,114	$38,442	$0	$308,007	$341,814	($33,807)
8	$252,894	$21,628	$38,442	$0	$312,964	$341,814	($28,850)
9	$258,457	$21,152	$38,442	$0	$318,052	$341,814	($23,762)
10	$264,143	$20,687	$38,442	$0	$323,273	$341,814	($18,541)
11	$269,955	$20,232	$38,442	$0	$328,629	$341,814	($13,185)
12	$275,894	$19,787	$38,442	$0	$334,122	$341,814	($7,691)
13	$281,963	$19,351	$38,442	$0	$339,757	$341,814	($2,057)
14	$288,166	$18,926	$38,442	$0	$345,534	$341,814	$3,721
15	$294,506	$18,509	$38,442	$0	$351,458	$341,814	$9,644
Totals	**$3,810,062**	**$319,670**	**$576,636**	**$420,836**	**$5,127,204**	**$5,127,203**	**$1**

SECTION D: Energy Calculations

- Energy Calculations

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Exhibit D5-1A.1
Robbinsville School District
ECM -1A **Lighting and Motion Sensor Upgrades**
Lighting

ECM Description
Lighting and Motion Sensor Upgrades
Summary of Annual Energy Savings
kWh 432,482
Therms
Assumptions, Clarifications, Deletions
Controller savings based on unblended rates
Burn hours are stipulated
Calculation Formulas
kWh Saved = kW saved x Stipulated Hours
Measurement & Verification:
OPTION A Stipulated Savings
Commissioning:
Third Party commissioning as per NJ ESIP

Data and Calculations:
Lighting Retrofit and Motion Sensors

	Building	Robbinsville HS	Pond MS	Windsor ES	Sharon ES		Total	
C1	Blended $/kWh	$0.1436	$0.1481	$0.1788	$0.1468			
C2	Un-Blended $/kWh	$0.1359	$0.1360	$0.1441	$0.1226			
C3	Lighting Savings Calculation							
C4	Saved kW	40.7	58.9	3.3	30.1			
C5	Saved kWh	143,903.0	155,655.9	5,474.1	61,684.5			
C6	Cost Savings	$20,660	$23,051	$979	$9,056			C5*C1
C7	Sensor Savings Calculation							
C8	Saved kWh	21,381	35,744	1,254	16,211			
C9	Total Sensor Savings $$	$2,906	$4,863	$181	$1,988			C8*C2
C10	Total kWh	165,284	191,400	6,728	77,896		441,308	C5+C8
C11	Total kWh $$	$23,566	$27,914	$1,160	$11,043		$63,682	C9+C6
C12	Derate	2%	2%	2%	2%			
C13	Total kWh	161,979	187,572	6,593	76,338		432,482	C10*(1-$C12)
C14	Total kWh $$	$23,094	$27,355	$1,136	$10,823		$62,409	C11*(1-$C12)

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	432,482	kwh/yr	0.00059190	Tons/kwh	256.0	Tons CO2/yr	44.714	26.9
Natural Gas	-	mmbtu/yr	0.05850000	Tons/mmBtu	0.0	Tons CO2/yr	-	0.0
Totals					**256.0**		**44.714**	**26.9**

Exhibit D5-1A.2
Robbinsville School District
ECM 1A - Lighting and Lighting Controls
Heating Penalty Calculations

ECM Description:
Heating Penalty Calculations
Summary of Annual Energy Savings:
kWh
Therms (3752)
Assumptions, Clarifications, Deletions:
See Notes below
Calculation Formulas
Heat Required = (kWh saved x Percent of Heating season lights are on x Fraction of Heat M/U) divided by boiler efficiency
Measurement & Verification:
OPTION C - Utility Bill Analysis.
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

		Robbinsville HS	Pond MS	Windsor ES	Sharon ES		Total	
C1	Total Savings from Lighting (kWh)	165,284	191,400	6,728	77,896		441,308	
C2	Heating season (Weeks)	24	24	24	24			
C3	% Heating Season	46%	46%	46%	46%			C2/52
C4	Fraction of Heat to be Made-up	40%	40%	40%	40%			
C5	Annual Equivalent of Lighting kWh Saved in Therms	5,640	6,531	230	2,658			(C1*3412)/100000
C6	Assumed Seasonal Heating Efficiency	85%	70%	85%	65%			65% - 95%
C7	Cost per therm	$0.91	$1.12	$2.26	$0.96			
C8	Extra Heat Required (Therms)	1,225	1,722	50	755		3,752	(C3*C4*C5)/C6
C9	Heating Penalty	$1,118	$1,931	$113	$724		$3,886	C8*C7
C10	De-rate	0%	0%	0%	0%			
C11	Extra Heat Required	1,225	1,722	50	755		3,752	C8*(1-C$10)
C12	Heating Penalty	$1,118	$1,931	$113	$724		$3,886	C9*(1-C$10)

Notes:

A = Heating Season = 1 – Fraction of the Year Representing the Cooling Season Liberal estimate of the heating season, as there are times during the year when the building is neither heated nor cooled.
B = Fraction of the Lighting Reduction that Has to Be Made Up by Heating A portion of the lighting heat is released at night plus interior zones will have limited heating loads. This is estimated at 40%.
C = Annual therm Equivalent of Lighting Saved Lighting reduction in kWh multiplied by 3,414 British Thermal Units (BTU).
D = Seasonal Heating Efficiency Estimate of basic efficiency of heating system. Heating system efficiency can vary from about 65-95%, depending on the type, use and technology.

Extra Heat Required (BTU) = A x B x C ÷ D

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity		kwh/yr	0.0005919	Tons/kwh	0	Tons CO2/yr	-	-
Natural Gas	375.20	mmbtu/yr	0.0585	Tons/mmBtu	21.95	Tons CO2/yr	3.83	2.31
Totals					21.95		3.83	2.31

Exhibit D5-1A.3
Robbinsville School District
ECM 1A - Lighting and Controls
Lighting Line-by-Lines

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Winter On Peak Hours	Winter Int Peak Hours	Total Winter Int Peak Hours	Total Saved kW	Total Winter On Peak kWh Existing	Total Winter Int Peak KWh Existing	Total Winter Int Peak KWh Proposed	Total Winter Int Peak KWh Saved	Total Winter Int Peak KWh Dollars Saved
Robbinsville School District NJ	Pole Barn	1	1	Shed	M400	1844IND	8	8	0.4580	0.0940	MH 400w	New 1x8 w/ Elect. NP Bal. & (4) 4' T8's	120	277	TRUE	3	2,520	-	-	2.82	8,956	-	-	-	$ -
Robbinsville School District NJ	Pole Barn	2	1	Shed	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pole Barn	3	1	Tool Room	2434T8	NR	2	2	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	60	277	FALSE	7	720	-	-	-	119	-	-	-	$ -
Robbinsville School District NJ	Pole Barn	4	1	Bath	2424T8	LP24	1	1	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	277	TRUE	5	#N/A	#N/A	#N/A	0.01	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pole Barn	5	1	Breakroom	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	60	277	TRUE	8	2,520	-	-	0.10	623	-	-	-	$ -
Robbinsville School District NJ	Pole Barn	6	1	Office	2434T8	NP24R24	2	2	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	60	277	TRUE	2	#N/A	#N/A	#N/A	0.07	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pole Barn	7	1	Shed 2	M400	1844IND	4	4	0.4580	0.0940	MH 400w	New 1x8 w/ Elect. NP Bal. & (4) 4' T8's	120	277	TRUE	3	2,520	-	-	1.41	4,478	-	-	-	$ -
Robbinsville School District NJ	Pole Barn	8	1	Shed 2	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pole Barn	9	Ext	Entryways	I60	CF13	2	2	0.0600	0.0130	Inc 60w	Compact One Piece 13w		120	TRUE	10	1,260	-	-	0.09	147	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	1	1	Classroom G-101	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	2	1	Coat Nook Classroom G-101	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	75	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	3	1	Bathroom Classroom G-101	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	14	2,520	-	-	0.01	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	4	1	Classroom G-103	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	5	1	Coat Nook Classroom G-103	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	75	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	6	1	Bathroom Classroom G-103	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	14	2,520	-	-	0.01	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	7	1	Classroom G-105	1844T8	NR	6	6	0.1120	0.1120	1x8, 4-Lamp T8 4'	No Retrofit	35	120	FALSE	30	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	8	1	Classroom G-105	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	35	120	FALSE	30	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	9	1	Classroom G-107	1844T8	NR	6	6	0.1120	0.1120	1x8, 4-Lamp T8 4'	No Retrofit	43	120	FALSE	30	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	10	1	Classroom G-107	1424T8	NR	6	6	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	43	120	FALSE	30	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	11	1	Classroom G-109	1844T8	NR	9	9	0.1120	0.1120	1x8, 4-Lamp T8 4'	No Retrofit	43	120	FALSE	30	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	12	1	Classroom G-109	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	43	120	FALSE	30	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	13	1	Bathroom Men G-wing	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	75	120	TRUE	14	2,520	-	-	0.03	208	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	14	1	Bathroom Women G-wing	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	75	120	TRUE	14	2,520	-	-	0.03	208	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	15	1	Office Child Study A	2434T8	NP24R24	6	6	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.21	1,247	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	16	1	Office Child Study B	2434T8	NP24R24	6	6	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.21	1,247	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	17	1	Closet Electrical	2434T8	NR	2	2	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	65	120	FALSE	7	720	-	-	-	119	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	18	1	Classroom 108	2434T8	NP24R24	9	9	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	75	120	TRUE	30	#N/A	#N/A	#N/A	0.31	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	19	1	Classroom 106	2434T8	NP24R24	10	10	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	55	120	TRUE	30	#N/A	#N/A	#N/A	0.35	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	20	1	Classroom 106	1844T8	NR	1	1	0.1120	0.1120	1x8, 4-Lamp T8 4'	No Retrofit	43	120	FALSE	30	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	21	1	Classroom 106	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	43	120	FALSE	30	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	22	1	Classroom 106	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	23	1	Entry Way To Cr 106	2242T5	NR	2	2	0.0980	0.0980	2x2, 4-Lamp T5	No Retrofit	30	120	FALSE	1	8,760	-	-	-	1,665	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	24	1	Classroom G-104	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	25	1	Coat Nook Classroom G-104	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	75	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	26	1	Bathroom Classroom G-104	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	14	2,520	-	-	0.01	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	27	1	Classroom G-102	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	28	1	Coat Nook Classroom G-102	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	75	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	29	1	Bathroom Classroom G-102	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	14	2,520	-	-	0.01	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	30	1	Hallway G Wing	CFL18	NR	4	4	0.0180	0.0180	CFL 18w	No Retrofit	30	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	31	1	Hallway G Wing	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	32	1	Hallway G Wing	2444T8	NP24R24	21	21	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	72	120	TRUE	28	#N/A	#N/A	#N/A	1.28	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	33	1	Classroom D-109	2444T8	NP34R24	12	12	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	85	120	TRUE	30	#N/A	#N/A	#N/A	0.49	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	34	1	Classroom D-107	2444T8	NP34R24	12	12	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	85	120	TRUE	30	#N/A	#N/A	#N/A	0.49	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	35	1	Classroom D-105	2444T8	NP34R24	12	12	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	85	120	TRUE	30	#N/A	#N/A	#N/A	0.49	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	36	1	Classroom D-103	2444T8	NP34R24	8	8	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	80	120	TRUE	30	#N/A	#N/A	#N/A	0.33	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	37	1	Classroom D-103	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	80	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	38	1	Classroom D-101	2444T8	NP34R24	9	9	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	60	120	TRUE	30	#N/A	#N/A	#N/A	0.37	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	39	1	Office D-102	2424T8	LP24	3	3	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	45	120	TRUE	3	2,520	-	-	0.04	425	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	40	1	Office Prep Room D-102	2424T8	LP24	1	1	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	45	120	TRUE	3	2,520	-	-	0.01	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	41	1	Office Prep Room D-102	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	50	120	TRUE	3	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	42	1	Classroom D-102 Sinks	2424T8	LP24	2	2	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	50	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	43	1	Classroom D-102 Sinks	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	44	1	Classroom D-102 Parts Room	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	26	120	TRUE	1	8,760	-	-	0.03	986	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	45	1	Classroom D-102 Tool Room	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	26	120	TRUE	1	8,760	-	-	0.03	986	-	-	-	$ -

Robbinsville School District NJ	Pond Road Middle School	46	1	Classroom D-102 (shop)	M250	1464LB	7	7	0.2950	0.1730	MH 250w	New Low Bay w/ (2) Elect. NPPS Bal. & (6) 4' HL T8's,	16	120	TRUE	30	#N/A	#N/A	#N/A	0.83	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	47	1	Classroom D-104	2444T8	NP34R24	19	19	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	85	120	TRUE	30	#N/A	#N/A	#N/A	0.77	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	48	1	Storage Bay. D -104	1844T8	NR	1	1	0.1120	0.1120	1x8, 4-Lamp T8 4'	No Retrofit	25	120	FALSE	7	720	-	-	-	78	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	49	1	Classroom D-104	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	50	1	Office D-104	2424T8	LP24	4	4	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	56	120	TRUE	3	2,520	-	-	0.06	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	51	1	Classroom D-102	2434T8	LP34	15	15	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	45	120	TRUE	30	#N/A	#N/A	#N/A	0.31	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	52	1	Hallway D Wing	2444T8	NP24R24	2	2	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	61	120	TRUE	28	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	53	1	Hallway D Wing	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	34	120	TRUE	28	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	54	1	Hallway D Wing	2424T8	LP24	12	12	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	34	120	TRUE	28	#N/A	#N/A	#N/A	0.17	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	55	1	Hallway D Wing	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	56	1	Lavatory Unisex	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	33	120	TRUE	6	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	57	1	Closet Book Storage / Electrical	1424T8	NR	4	4	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	31	120	FALSE	7	720	-	-	-	162	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	58	1	Classroom E-101	2434T8	NP24R24	8	8	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.28	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	59	1	Classroom E-103	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	60	1	Classroom E-105	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	61	1	Classroom E-107	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	62	1	Classroom E-109	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	63	1	Classroom E-111	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	64	1	Classroom E-112	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	65	1	Classroom E-110	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	66	1	Classroom E-108	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	67	1	Classroom E-106	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	68	1	Classroom E-104	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	69	1	Classroom E-102	2434T8	NP24R24	8	8	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.28	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	70	1	Office E Wing Front	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	60	120	TRUE	3	2,520	-	-	0.14	831	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	71	1	Office E Wing Rear	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	60	120	TRUE	3	2,520	-	-	0.14	831	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	72	1	Hallway E Wing	2424T8	LP24	12	12	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	32	120	TRUE	28	#N/A	#N/A	#N/A	0.17	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	73	1	Hallway E Wing	CFL18	NR	12	12	0.0180	0.0180	CFL 18w	No Retrofit	32	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	74	1	Hallway E Wing	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	75	1	Hallway E Wing Display Case	1313	LP13	1	1	0.0410	0.0210	1x3, 1-Lamp	Elect. LP Bal. & (1) 3' T8		120	TRUE	28	#N/A	#N/A	#N/A	0.02	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	76	1	Hallway E Wing / M Wing	2424T8	LP24	9	9	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	31	120	TRUE	111	#N/A	#N/A	#N/A	0.13	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	77	1	Hallway E Wing / M Wing	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	78	1	Bathroom, Boys	222UT8	NP22R22	4	4	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	40	120	TRUE	14	2,520	-	-	0.10	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	79	1	Bathroom, Girls	222UT8	NP22R22	4	4	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	40	120	TRUE	14	2,520	-	-	0.10	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	80	1	Closet Custodian	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	81	1	Classroom M-106	2434T8	NP24R24	6	6	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	60	120	TRUE	30	#N/A	#N/A	#N/A	0.21	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	82	1	Classroom M-105	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	53	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	83	1	Classroom M-104	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	53	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	84	1	Bathroom, Boys	222UT8	NP22R22	4	4	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	40	120	TRUE	14	2,520	-	-	0.10	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	85	1	Bathroom, Girls	222UT8	NP22R22	4	4	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	40	120	TRUE	14	2,520	-	-	0.10	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	86	1	Closet Custodian	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	87	1	Hallway C / M	2424T8	LP24	19	19	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	31	120	TRUE	28	#N/A	#N/A	#N/A	0.28	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	88	1	Hallway C / M	K-LED	NR	6	6	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	204	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	89	1	Hallway C / M (display Cases	1424T8	LP24	4	4	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	28	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	90	1	Bathroom Unisex	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	33	120	TRUE	14	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	91	1	Classroom C-101	2444T8	NP34R24	16	16	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	80	120	TRUE	30	#N/A	#N/A	#N/A	0.65	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	92	1	Office-classroom C-101	2424T8	LP24	2	2	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	31	120	TRUE	3	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	93	1	Storage-classroom C-101	2424T8	NR	5	5	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	31	120	FALSE	7	720	-	-	-	203	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	94	1	Storage Closet Hall C M	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	95	1	Classroom C-103	2444T8	NP34R24	15	15	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	60	120	TRUE	30	#N/A	#N/A	#N/A	0.61	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	96	1	Storage Class C-103	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	30	120	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	97	1	Closet Elec	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	98	1	Closet Communications	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	30	120	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	99	1	Bathroom Boys	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	14	2,520	-	-	0.14	831	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	100	1	Bathroom Girls	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	14	2,520	-	-	0.14	831	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	101	1	Closet Custodial	1424T8	NR	2	2	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	32	120	FALSE	7	720	-	-	-	81	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	102	1	Classroom C-105	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	103	1	Classroom C-105	2434T8	NP24R24	23	23	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.80	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	104	1	Office Prep Classroom C-107	2444T8	NP34R24	4	4	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	60	120	TRUE	3	2,520	-	-	0.16	1,095	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	105	1	Closet 1 Storage By C-107	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	106	1	Closet 2 Storage By C-107	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	120	FALSE	7	720	-	-	-	41	-	-	-	$ -

Robbinsville School District NJ	Pond Road Middle School	107	1	Classroom C-109	2434T8	NP24R24	23	23	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	75	120	TRUE	30	#N/A	#N/A	#N/A	0.80	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	108	1	Classroom C-109	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	109	1	Classroom C-114	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	110	1	Classroom C-112	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	111	1	Classroom C-110	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	112	1	Classroom C-108	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	113	1	Classroom C-106	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	114	1	Classroom C-104	2434T8	NP24R24	12	12	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.42	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	115	1	Classroom C-102	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	116	1	Bathroom- Class C-102	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	33	120	TRUE	14	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	117	1	Storage C-2	1424T8	NR	4	4	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	120	FALSE	7	720	-	-	-	162	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	118	1	Hallway Cwing	2444T8	NP24R24	16	16	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	60	120	TRUE	28	#N/A	#N/A	#N/A	0.98	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	119	1	Hallway Cwing	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	120	1	Classroom M-103	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	121	1	Classroom M-103	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	33	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	122	1	Classroom M-102	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	123	1	Classroom M-102	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	33	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	124	1	Classroom M-101	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	125	1	Classroom M-101	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	33	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	126	1	Mechanical Room M-1	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	23	120	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	127	1	Hallway M - C	2424T8	LP24	8	8	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	21	120	TRUE	28	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	128	1	Hallway M - C	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	129	1	Hallway B Wing	2424T8	LP24	12	12	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	21	120	TRUE	28	#N/A	#N/A	#N/A	0.17	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	130	1	Hallway B Wing	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	131	1	Classroom M-112	2444T8	NP34R24	8	8	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	60	120	TRUE	30	#N/A	#N/A	#N/A	0.33	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	132	1	Classroom M-111	2444T8	NP34R24	16	16	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	75	120	TRUE	30	#N/A	#N/A	#N/A	0.65	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	133	1	Conference / Office	2434T8	LP34	4	4	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	55	120	TRUE	4	#N/A	#N/A	#N/A	0.08	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	134	1	Hallway M - A	2424T8	LP24	8	8	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	21	120	TRUE	28	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	135	1	Hallway M - A	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	136	1	Classroom M-110	2434T8	LP34	10	10	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	69	120	TRUE	30	#N/A	#N/A	#N/A	0.20	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	137	1	Classroom M-109	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	138	1	Classroom M-109	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	33	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	139	1	Classroom M-108	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	140	1	Classroom M-108	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	141	1	Classroom M-107	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	142	1	Classroom M-107	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	143	1	Hallway M -f	2424T8	LP24	8	8	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	21	120	TRUE	28	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	144	1	Hallway M -f	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	145	1	Media Center Lobby	222UT8	NP22R22	9	9	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	31	120	TRUE	8	2,520	-	-	0.23	1,276	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	146	1	Media Center Lobby	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	147	1	Media Center Front	4444T8	NR	24	24	0.1120	0.1120	4x4, 4-Lamp T8	No Retrofit	50	120	FALSE	8	2,520	-	-	-	6,571	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	148	1	Media Center Front	CFL13	NR	21	21	0.0130	0.0130	CFL 13w	No Retrofit		120	FALSE	8	2,520	-	-	-	667	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	149	1	Media Center Front	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	150	1	Media Center Rear	4444T8	NR	24	24	0.1120	0.1120	4x4, 4-Lamp T8	No Retrofit	50	120	FALSE	8	2,520	-	-	-	6,571	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	151	1	Media Center Rear	CFL13	NR	22	22	0.0130	0.0130	CFL 13w	No Retrofit		120	FALSE	8	2,520	-	-	-	699	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	152	1	Media Center Rear	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	153	1	Media Center Side Lobby	222UT8	NP22R22	2	2	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	23	120	TRUE	8	2,520	-	-	0.05	284	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	154	1	Office Media Recording	2444T8	NP24R24	2	2	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl		120	TRUE	3	2,520	-	-	0.12	548	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	155	1	Office Media	2444T8	NP24R24	2	2	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl		120	TRUE	3	2,520	-	-	0.12	548	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	156	1	Audio / Visual	2434T8	NP24R24	10	10	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	60	120	TRUE	3	2,520	-	-	0.35	2,078	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	157	1	Office Curric Library	2444T8	NP24R24	4	4	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	80	120	TRUE	3	2,520	-	-	0.24	1,095	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	158	1	Hallway M A To F	4444T8	NP24R24	3	3	0.1120	0.0490	4x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	28	#N/A	#N/A	#N/A	0.18	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	159	1	Hallway M A To F	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	28	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	160	1	Hallway M A To F	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	161	1	Hallway Front Lib	2424T8	LP24	8	8	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	1	8,760	-	-	0.12	3,943	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	162	1	Hallway Front Lib	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	163	1	Hallwaya Gym	2424T8	LP24	8	8	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	1	8,760	-	-	0.12	3,943	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	164	1	Hallwaya Gym	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	165	1	Gym Hall Lobby	2424T8	LP24	8	8	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	1	8,760	-	-	0.12	3,943	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	166	1	Gym Hall Lobby Display Case	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	167	1	Gym Hall Lobby	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	102	-	-	-	$ -

Robbinsville School District NJ	Pond Road Middle School	168	1	Hallwayay Main Ofc To Gym	2424T8	LP24	8	8	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	1	8,760	-	-	0.12	3,943	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	169	1	Hallwayay Main Ofc To Gym	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	170	1	Main Entry	4444T8	NP24R24	2	2	0.1120	0.0490	4x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	28	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	171	1	Main Lobby	4444T8	NP24R24	18	18	0.1120	0.0490	4x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	28	#N/A	#N/A	#N/A	1.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	172	1	Main Lobby Display Case	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	1	8,760	-	-	0.03	986	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	173	1	Main Lobby	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	174	1	Hallwayay F Wing	2424T8	LP24	10	10	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	1	8,760	-	-	0.15	4,928	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	175	1	Hallwayay F Wing	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	176	1	Classroom F-102	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	177	1	Classroom F-102	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	178	1	Classroom F-104	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	179	1	Classroom F-104	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	180	1	Classroom F-106	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	181	1	Classroom F-106	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	182	1	Classroom F-108	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.38	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	183	1	Classroom F-108	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	59	120	TRUE	30	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	184	1	Storage/ Elec	1424T8	NR	2	2	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	32	120	FALSE	7	720	-	-	-	81	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	185	1	Locker Room Girls	1424T8	LP24	11	11	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	22	#N/A	#N/A	#N/A	0.16	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	186	1	Locker Room Girls	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	187	1	Bathroom Locker Room Girls	222UT8	NP22R22	2	2	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	14	2,520	-	-	0.05	284	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	188	1	Shower Locker Girls	1844T8	LP44	3	3	0.1120	0.0860	1x8, 4-Lamp T8 4'	Elect. LP Bal. & (4) 4' T8's	35	120	TRUE	22	#N/A	#N/A	#N/A	0.08	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	189	1	Office Coach Girls	2444T8	NP24R24	2	2	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	70	120	TRUE	3	2,520	-	-	0.12	548	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	190	1	Bathroom Office Coach	222UT8	NP22R22	2	2	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	5	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	191	1	Locker Room Boys	1424T8	LP24	11	11	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	22	#N/A	#N/A	#N/A	0.16	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	192	1	Locker Room Boys	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	193	1	Bathroom Locker Room Boys	222UT8	NP22R22	2	2	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	14	2,520	-	-	0.05	284	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	194	1	Shower Locker Boys	1844T8	LP44	3	3	0.1120	0.0860	1x8, 4-Lamp T8 4'	Elect. LP Bal. & (4) 4' T8's	35	120	TRUE	22	#N/A	#N/A	#N/A	0.08	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	195	1	Office Coach Boys	2444T8	NP24R24	2	2	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	70	120	TRUE	3	2,520	-	-	0.12	548	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	196	1	Bathroom Office Coach	222UT8	NP22R22	2	2	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	5	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	197	1	Bathroom Boys A Wing/gym	222UT8	NP22R22	4	4	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	14	2,520	-	-	0.10	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	198	1	Bathroom Girlss A Wing/gym	222UT8	NP22R22	4	4	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	14	2,520	-	-	0.10	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	199	1	Custodian A Wing/gym	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	30	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	200	1	Classroom A-105	2444T8	NP24R24	15	15	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	80	120	TRUE	30	#N/A	#N/A	#N/A	0.92	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	201	1	Storage (tests)	2444T8	NR	2	2	0.1120	0.1120	2x4, 4-Lamp T8	No Retrofit	35	120	FALSE	7	720	-	-	-	156	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	202	1	Storage (tests)	222UT8	NR	2	2	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	56	120	FALSE	7	720	-	-	-	81	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	203	1	Classroom A-106	2444T8	NP34R24	14	14	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	80	120	TRUE	30	#N/A	#N/A	#N/A	0.57	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	204	1	Closet Electric	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	25	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	205	1	Classroom A-107	2444T8	NP34R24	6	6	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.24	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	206	1	Classroom A-101	2444T8	NP34R24	15	15	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	80	120	TRUE	30	#N/A	#N/A	#N/A	0.61	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	207	1	Classroom A-102	2444T8	NP34R24	12	12	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	80	120	TRUE	30	#N/A	#N/A	#N/A	0.49	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	208	1	Bathroom Boys Main Lobby	222UT8	NP22R22	4	4	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	14	2,520	-	-	0.10	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	209	1	Bathroom Girls Main Lobby	222UT8	NP22R22	4	4	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	14	2,520	-	-	0.10	567	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	210	1	Custodian Main Lobby	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	30	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	211	1	Classroom A-103	2444T8	NP34R24	18	18	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	70	120	TRUE	30	#N/A	#N/A	#N/A	0.73	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	212	1	Classroom A-104	2444T8	NP34R24	15	15	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	80	120	TRUE	30	#N/A	#N/A	#N/A	0.61	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	213	1	Classroom B-101	2434T8	NP24R24	25	25	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	30	#N/A	#N/A	#N/A	0.87	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	214	1	Closet Classroom B-101	2424T8	NR	4	4	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	20	120	FALSE	7	720	-	-	-	162	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	215	1	Closet Classroom B-101	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	216	1	Practice Room 1	1424	LP24	4	4	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	55	120	TRUE	4	#N/A	#N/A	#N/A	0.11	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	217	1	Practice Room 2	1424	LP24	8	8	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	55	120	TRUE	4	#N/A	#N/A	#N/A	0.23	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	218	1	Practice Room 3	1424	LP24	4	4	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	55	120	TRUE	4	#N/A	#N/A	#N/A	0.11	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	219	1	Office Music	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.14	831	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	220	1	Hallway Music	2424T8	LP24	4	4	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	45	120	TRUE	28	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	221	1	Hallway Music	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	222	1	Office B-103	2424T8	LP24	3	3	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	55	120	TRUE	3	2,520	-	-	0.04	425	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	223	1	Classroom B-102	2444T8	NP34R24	8	8	0.1120	0.0700	2x4, 4-Lamp T8	Elect. NP Bal. & (3) 4' T8's, Refl	65	120	TRUE	30	#N/A	#N/A	#N/A	0.33	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	224	1	Mechanical Room	1424	LP24	7	7	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	20	120	TRUE	7	720	-	-	0.20	352	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	225	1	Mechanical Room	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	226	1	Closet Generator	1424	LP24	2	2	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	20	120	TRUE	7	720	-	-	0.06	101	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	227	1	Closet Electrical	1424	LP24	1	1	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	20	120	TRUE	7	720	-	-	0.03	50	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	228	1	Central Receiving Ofc	1424	LP24	8	8	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	3	2,520	-	-	0.23	1,408	-	-	-	$ -

Robbinsville School District NJ	Pond Road Middle School	229	1	Central Receiving	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	230	1	Storage Mens Locker	222UT8	NR	3	3	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	56	120	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	231	1	Maintenance Shop	1424	LP24	10	10	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	35	120	TRUE	8	2,520	-	-	0.28	1,760	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	232	1	Maintenance Shop	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	233	1	Maintenance Shop Tool Room	1424	LP24	2	2	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	35	120	TRUE	7	720	-	-	0.06	101	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	234	1	Office Maintenance	2444T8	NP24R24	2	2	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl		120	TRUE	3	2,520	-	-	0.12	548	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	235	1	Bathroom Unisex 1	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	14	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	236	1	Bathroom Unisex 2	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	14	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	237	1	Faculty Lounge	2424T8	LP24	11	11	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	8	2,520	-	-	0.16	1,560	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	238	1	Faculty Lounge	VEND-CD	NR	2	2	0.3390	0.3390	Cold Drink Machine	No Retrofit		120	FALSE	1	8,760	-	-	-	5,761	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	239	1	Faculty Lounge	VEND-SN	NR	1	1	0.0410	0.0410	Snack Machine	No Retrofit		120	FALSE	1	8,760	-	-	-	348	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	240	1	Hallway Maint/kitchen	2424T8	LP24	10	10	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	28	#N/A	#N/A	#N/A	0.15	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	241	1	Hallway Maint/kitchen	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	242	1	Kitchen	2444T8	NP24R24	18	18	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	53	120	TRUE	21	#N/A	#N/A	#N/A	1.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	243	1	Dishwasing	2424T8	LP24	5	5	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	23	120	TRUE	21	#N/A	#N/A	#N/A	0.07	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	244	1	Pantry Cage	2424T8	LP24	6	6	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	27	120	TRUE	21	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	245	1	Office Maintenance	2444T8	NP24R24	2	2	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl		120	TRUE	3	2,520	-	-	0.12	548	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	246	1	Locker Room - Kitchen	222UT8	NP22R22	2	2	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	56	120	TRUE	21	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	247	1	Kitchen Exit Signs	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	248	1	Main Office	2444T8	NP24R24	14	14	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	1	8,760	-	-	0.86	13,324	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	249	1	Main Office	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	250	1	Office Principal	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.14	831	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	251	1	Bathroom Office Principal	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	36	120	TRUE	5	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	252	1	Closet Main Office	222UT8	NR	1	1	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	36	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	253	1	Office Guidance	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.14	831	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	254	1	Break Room	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	8	2,520	-	-	0.14	831	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	255	1	Conference Room	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	4	#N/A	#N/A	#N/A	0.14	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	256	1	Office Director	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.10	623	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	257	1	Office Guidance	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.10	623	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	258	1	Office Assistant Principal	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.10	623	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	259	1	Storage Room	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit		120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	260	1	Hallway	2424T8	LP24	4	4	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	28	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	261	1	Health Suite	2444T8	NP24R24	10	10	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	90	120	TRUE	1	8,760	-	-	0.61	9,517	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	262	1	Bathroom Health	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	36	120	TRUE	14	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	263	1	Computer Health	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	36	120	TRUE	3	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	264	1	Health Suite	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	265	1	Office Nurse	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.10	623	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	266	1	Waiting Room Nurse	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	30	120	TRUE	3	2,520	-	-	0.03	208	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	267	1	Waiting Room Nurse	2424T8	LP24	1	1	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	3	2,520	-	-	0.01	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	268	1	Waiting Room Nurse	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	269	1	Bathroom Faculty Men	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	36	120	TRUE	14	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	270	1	Bathroom Faculty Women	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	36	120	TRUE	14	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	271	1	Gym	M400	1484LBHPPSWGTG	24	24	0.4580	0.2940	MH 400w	New Low Bay w/ (2) Elect. HPPS Bal. & (8) 4' HL T8's, WG, TG	16	120	TRUE	22	#N/A	#N/A	#N/A	3.82	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	272	1	Storage 1 Gym	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	20	120	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	273	1	Storage 2 Gym	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	20	120	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	274	Ext	Exterior Mech	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		120	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	275	1	Gym	K-LED	NR	6	6	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	204	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	276	1	Storage Café	2424T8	NR	4	4	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	21	120	FALSE	7	720	-	-	-	162	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	277	1	Cafeteria	2424T8	LP24	63	63	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	33	120	TRUE	21	#N/A	#N/A	#N/A	0.92	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	278	1	Cafeteria	CFL2X13	NR	12	12	0.0260	0.0260	CFL (2) 13w	No Retrofit		120	FALSE	21	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	279	1	Cafeteria	K-LED	NR	6	6	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	204	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	280	1	Corridor Café	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	28	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Pond Road Middle School	281	1	Stage	1424T8	NR	33	33	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	35	120	FALSE	7	720	-	-	-	1,337	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	282	1	Stage Ramps	1424T8	NR	7	7	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	18	120	FALSE	7	720	-	-	-	284	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	283	1	Cafeteria	K-LED	NR	6	6	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	204	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	284	1	Cafeteria	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	285	Ext	Gym Wall Side Entries	S70	CF42CAN-PC	2	2	0.0940	0.0420	HPS 70w	CF Fixture - New 42w Canopy		120	TRUE	10	1,260	-	-	0.10	230	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	286	Ext	F Wing Entry	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w		120	TRUE	10	1,260	-	-	0.05	92	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	287	Ext	M Wing Entry Door Wall	S50	NR	1	1	0.0640	0.0640	HPS 50w	No Retrofit		120	FALSE	10	1,260	-	-	-	78	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	288	Ext	E Wing Wall	S150	NR	2	2	0.1880	0.1880	HPS 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	460	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	289	Ext	E Wing Entry Door	S70	CF42CAN-PC	1	1	0.0940	0.0420	HPS 70w	CF Fixture - New 42w Canopy		120	TRUE	10	1,260	-	-	0.05	115	-	-	-	$ -

Robbinsville School District NJ	Pond Road Middle School	290	Ext	D Wing Wall	S50	NR	1	1	0.0640	0.0640	HPS 50w	No Retrofit		120	FALSE	10	1,260	-	-	-	78	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	291	Ext	G Wing Entry Door Wall	S150	NR	2	2	0.1880	0.1880	HPS 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	460	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	292	Ext	G Wing Parking Lot Side Door	S70	CF42CAN-PC	1	1	0.0940	0.0420	HPS 70w	CF Fixture - New 42w Canopy		120	TRUE	10	1,260	-	-	0.05	115	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	293	Ext	G-m-c Wings Walls	S50	NR	2	2	0.0640	0.0640	HPS 50w	No Retrofit		120	FALSE	10	1,260	-	-	-	156	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	294	Ext	G-m-c Wings Walls	S150	NR	2	2	0.1880	0.1880	HPS 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	460	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	295	Ext	G-m-c Wing Park Lot	S250	IND150SB-PC	2	2	0.2950	0.1650	HPS 250w	Induction 150w Shoe Box		120	TRUE	10	1,260	-	-	0.25	721	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	296	Ext	Rear Parking Lot By Back Field	S400	IND200SB-PC	3	3	0.4650	0.2150	HPS 400w	Induction 200w Shoe Box		120	TRUE	10	1,260	-	-	0.73	1,705	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	297	Ext	C Wing Door	S70	CF42CAN-PC	1	1	0.0940	0.0420	HPS 70w	CF Fixture - New 42w Canopy		120	TRUE	10	1,260	-	-	0.05	115	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	298	Ext	C Wing Doors / Wall	S150	NR	1	1	0.1880	0.1880	HPS 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	230	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	299	Ext	C-m-b Wings Walls	S150	NR	3	3	0.1880	0.1880	HPS 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	689	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	300	Ext	C-m-b Wing Park Lot	S250	IND150SB-PC	3	3	0.2950	0.1650	HPS 250w	Induction 150w Shoe Box		120	TRUE	10	1,260	-	-	0.38	1,082	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	301	Ext	Band Room Door	S150	NR	1	1	0.1880	0.1880	HPS 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	230	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	302	Ext	B Wing Door	S70	CF42CAN-PC	1	1	0.0940	0.0420	HPS 70w	CF Fixture - New 42w Canopy		120	TRUE	10	1,260	-	-	0.05	115	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	303	Ext	Cafeteria Hall Door	S70	CF42CAN-PC	1	1	0.0940	0.0420	HPS 70w	CF Fixture - New 42w Canopy		120	TRUE	10	1,260	-	-	0.05	115	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	304	Ext	Maintenance Shop Wall	S150	NR	2	2	0.1880	0.1880	HPS 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	460	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	305	Ext	Front Wall	S150	NR	1	1	0.1880	0.1880	HPS 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	230	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	306	Ext	Main Entry Office Side	S70	CF42CAN-PC	2	2	0.0940	0.0420	HPS 70w	CF Fixture - New 42w Canopy		120	TRUE	10	1,260	-	-	0.10	230	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	307	Ext	Main Entry Gym Side	S70	CF42CAN-PC	2	2	0.0940	0.0420	HPS 70w	CF Fixture - New 42w Canopy		120	TRUE	10	1,260	-	-	0.10	230	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	308	Ext	Front Parking Lot Single Poles	S250	IND150SB-PC	10	10	0.2950	0.1650	HPS 250w	Induction 150w Shoe Box		120	TRUE	10	1,260	-	-	1.26	3,605	-	-	-	$ -
Robbinsville School District NJ	Pond Road Middle School	309	Ext	Front Parking Lot Double Poles	S2X250	IND2X150SB-PC	4	4	0.5900	0.3300	(2) HPS 250w	(2) Induction 150w Shoe Box		120	TRUE	10	1,260	-	-	1.01	2,884	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	1	1	Entry Bath B Mp1	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit	21	277	FALSE	9	2,520	-	-	-	127	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	2	1	Bath B Mp2	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	29	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	3	1	Jc Mp3	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	21	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	4	1	Entry Gath B Mp4	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit	21	277	FALSE	9	2,520	-	-	-	127	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	5	1	Bath G Mp2	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	29	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	6	1	Elec Mp6	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	20	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	7	1	Storage Mp7	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	50	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	8	1	Office Board Of Ed Mp8	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	85	277	FALSE	3	2,520	-	-	-	2,229	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	9	1	Office Board Of Ed Mp8	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	85	277	FALSE	3	2,520	-	-	-	557	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	10	1	Office Board Of Ed Mp8	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	85	277	FALSE	1	8,760	-	-	-	1,937	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	11	1	Office Board Of Ed Mp8	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	12	1	Office Mp9	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	80	277	TRUE	103	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	13	1	Office Mp10	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	70	277	FALSE	3	2,520	-	-	-	1,115	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	14	1	Office Mp10	1424T5	NR	4	4	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	3	2,520	-	-	-	1,115	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	15	1	Hall Mp11	CFL2X26	NR	3	3	0.0520	0.0520	CFL 2x26w	No Retrofit	23	277	FALSE	1	8,760	-	-	-	1,326	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	16	1	Hall Mp11	CFL2X26	NR	6	6	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	11	2,160	-	-	-	654	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	17	1	Hall Mp11	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	18	1	Office Mp12	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	76	277	TRUE	103	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	19	1	Office Mp13	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	76	277	TRUE	103	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	20	1	Office Mp14	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	76	277	TRUE	103	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	21	1	Office Mp15	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	76	277	TRUE	103	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	22	1	Office Mp16	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	76	277	TRUE	103	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	23	1	Copy Rm Mp17	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	50	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	24	1	Conference Mp18	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	77	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	25	1	Conference Mp18	1424T5	NR	4	4	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	26	1	Office-careers Mp19	1844T5	NR	3	3	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	77	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	27	1	Office-careers Mp19	11264T5DS	NR	3	3	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	77	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	28	1	Strg Mp20	2434T8	NR	4	4	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	45	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	29	1	Classroom B103	11264T5DS	NR	3	3	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	65	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	30	1	Bath B103.1	223UT8	NR	1	1	0.0850	0.0850	2x2, 3-Lamp U T8	No Retrofit	34	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	31	1	Strg Mp21	2434T8	NR	3	3	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	55	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	32	1	Office Guidance Mp22	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	54	277	FALSE	3	2,520	-	-	-	1,115	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	33	1	Office Guidance Mp22	1424T5	NR	4	4	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	3	2,520	-	-	-	1,115	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	34	1	Office Guidance Mp22	CFL2X26	NR	5	5	0.0520	0.0520	CFL 2x26w	No Retrofit	24	277	FALSE	3	2,520	-	-	-	636	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	35	1	Office Guidance Mp22	1424T5	NR	1	1	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	1	8,760	-	-	-	969	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	36	1	Office Guidance Mp22	CFL2X26	NR	2	2	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	1	8,760	-	-	-	884	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	37	1	Office Guidance Mp22	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	38	1	Conference Mp23	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	54	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	39	1	Conference Mp23	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	40	1	Office Mp24	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	54	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	41	1	Office Mp24	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A

Robbinsville School District NJ	Robbinsville High School	42	1	Office Mp25	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	54	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	43	1	Office Mp26	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	70	277	TRUE	103	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	44	1	Office Mp27	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	70	277	TRUE	103	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	45	1	Office Mp28	2434T8	LP34	6	6	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	80	277	TRUE	103	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	46	1	Office Mp29	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	70	277	TRUE	103	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	47	1	Office Attendance Mp30	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	8'3	277	FALSE	3	2,520	-	-	-	557	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	48	1	Office Attendance Mp30	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit		277	FALSE	3	2,520	-	-	-	1,115	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	49	1	Office Attendance Mp30	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	50	1	Office Attendance Mp31	2434T8	LP34	4	4	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	70	277	TRUE	103	#N/A	#N/A	#N/A	0.08	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	51	1	Office Mp32	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	43	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	52	1	Office Mp33	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	43	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	53	1	Office Main Mp34	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	50	277	FALSE	1	8,760	-	-	-	1,937	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	54	1	Office Main Mp34	1424T5	NR	9	9	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	55	1	Office Main Mp34	1844T5	NR	6	6	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	50	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	56	1	Office Main Mp34	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	1	8,760	-	-	-	442	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	57	1	Office Main Mp34	CFL2X26	NR	7	7	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	3	2,520	-	-	-	890	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	58	1	Office Main Mp34	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	59	1	Copy Rm Mp35	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	28	277	TRUE	103	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	60	1	Copy Rm Mp35	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	61	1	Mail Rm Mp36	2434T8	LP34	1	1	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	51	277	TRUE	103	#N/A	#N/A	#N/A	0.02	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	62	1	Strg Mp37	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	18	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	63	1	Kitchen Mp38	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	21	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	64	1	Bath	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	65	1	Conference Mp40	1844T5DIM	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5, DIM	No Retrofit	83	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	66	1	Conference Mp40	1844T5DIM	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5, DIM	No Retrofit		277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	67	1	Strg Mp41	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	20	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	68	1	Office Mp42	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	43	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	69	1	Office Mp42	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	70	1	Bath Mp43	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	71	1	Classroom Mp44	2434T8	NR	3	3	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	45	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	72	1	Lab A102	11264T5DS	NR	6	6	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	73	1	Lab A102	1844T5DS	NR	6	6	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	74	1	Bath A102.1	222UT8	NR	1	1	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit		277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	75	1	Office Mp45	2434T8	LP34	1	1	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's		277	TRUE	103	#N/A	#N/A	#N/A	0.02	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	76	1	Classroom A103	11264T5DS	NR	7	7	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	68	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	77	1	Classroom A103	1844T5DS	NR	1	1	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	78	1	Classroom A103	1424T5	NR	3	3	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	79	1	Strg Mp46	2434T8	NR	3	3	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit		277	FALSE	7	720	-	-	-	178	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	80	1	Classroom A101	11264T5DS	NR	4	4	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	68	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	81	1	Classroom A101	1844T5DS	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	82	1	Elec Mp47	1424T8	NR	2	2	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	24	277	FALSE	7	720	-	-	-	81	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	83	1	Elec Mp48	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	24	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	84	1	Media Ctr Mp49	1424T5	NR	24	24	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	75	277	FALSE	20	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	85	1	Media Ctr Mp50	1424T5	NR	24	24	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	25	277	FALSE	20	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	86	1	Media Ctr Mp51	1884T5	NR	16	16	0.4560	0.4560	1x8, 8-Lamp T5	No Retrofit	38	277	FALSE	20	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	87	1	Media Ctr Mp51	M175	NR	33	33	0.2100	0.2100	MH 175w	No Retrofit		277	FALSE	99	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	88	1	Media Ctr Mp51	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	20	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	89	1	Media Ctr Mp51	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	90	1	Media Ctr Mp52	223UT8	HP32R22	6	6	0.0850	0.0610	2x2, 3-Lamp U T8	Elect. HP Bal. & (3) 2' T8's, Refl		277	TRUE	20	#N/A	#N/A	#N/A	0.14	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	91	1	Media Ctr Mp52	CFL2X26	NR	19	19	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	20	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	92	1	Office Mp53	2434T8	NR	3	3	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	40	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	93	1	Printig Rm Mp54	2434T8	NR	2	2	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	35	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	94	1	Archives Mp55	2434T8	NR	1	1	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit		277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	95	1	Mdf Rm Mp56	1424T8	NR	4	4	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	18	277	FALSE	7	720	-	-	-	162	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	96	1	Strg Mp57	2434T8	NR	2	2	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit		277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	97	1	Bath M58	222UT8	NR	1	1	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	16	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	98	1	Bath M59	222UT8	NR	1	1	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	16	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	99	1	Classroom M103	11264T5DS	NR	6	6	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	100	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	100	1	Classroom M103	1424T5	NR	4	4	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	100	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	101	1	Classroom M103	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	102	1	Classroom M103	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -

Robbinsville School District NJ	Robbinsville High School	103	1	Classroom M103	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	33	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	104	1	Strg Mp60	2434T8	NR	6	6	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	36	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	105	1	Classroom M101	11264T5DS	NR	6	6	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	100	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	106	1	Classroom M101	1424T5	NR	4	4	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	100	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	107	1	Classroom M101	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	108	1	Classroom M101	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	109	1	Strg Mp61	2424T8	NR	2	2	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	20	277	FALSE	7	720	-	-	-	81	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	110	1	Strg Mp62	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	18	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	111	1	Closet 63	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	112	1	Classroom C102	11264T5DS	NR	4	4	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	113	1	Classroom C102	1844T5DS	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	114	1	Classroom C102	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	115	1	Classroom C104	11264T5DS	NR	6	6	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	100	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	116	1	Classroom C104	1844T5DS	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	117	1	Classroom C104	2424T8	NR	3	3	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	26	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	118	1	Classroom C103	11264T5DS	NR	7	7	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	115	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	119	1	Classroom C103	1844T5DS	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	120	1	Classroom C103	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	121	1	Strg Mp65	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	32	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	122	1	Prep Rm Mp66	2424T8	LP24	2	2	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	26	277	TRUE	20	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	123	1	Classroom C101	11264T5DS	NR	7	7	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	104	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	124	1	Classroom C101	1844T5DS	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	125	1	Elev Rm Mp67	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	20	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	126	1	Elec Rm Mp68	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	20	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	127	1	Nurse Mp69	2434T8	NP24R24	2	2	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	45	277	TRUE	103	#N/A	#N/A	#N/A	0.07	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	128	1	Nurse Mp69	2434T8	NP24R24	6	6	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	55	277	TRUE	3	2,520	-	-	0.21	1,247	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	129	1	Bath Mp71	223UT8	NR	1	1	0.0850	0.0850	2x2, 3-Lamp U T8	No Retrofit		277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	130	1	Strg Mp72	2434T8	NR	2	2	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit		277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	131		Office Mp73	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	70	277	TRUE	103	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	132	1	Classroom D102	11264T5DS	NR	4	4	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	104	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	133	1	Classroom D102	1844T5DS	NR	7	7	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	134	1	Classroom D102	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	135	1	Prep Rm Mp74	2424T8	LP24	3	3	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	35	277	TRUE	20	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	136	1	Classroom D104	11264T5DS	NR	4	4	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	104	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	137	1	Classroom D104	1844T5DS	NR	7	7	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	138	1	Classroom D104	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	139	1	Strg Mp75	2424T8	NR	3	3	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	28	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	140	1	Classroom D103	11264T5DS	NR	4	4	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	104	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	141	1	Classroom D103	1844T5DS	NR	7	7	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	142	1	Classroom D103	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	143	1	Prep Rm Mp76	2424T8	LP24	3	3	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	35	277	TRUE	20	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	144	1	Classroom D101	11264T5DS	NR	4	4	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	104	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	145	1	Classroom D101	1844T5DS	NR	7	7	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	146	1	Classroom D101	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	147	1	Bath Entry Mp 77	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit	24	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	148	1	Bath B Mp78	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	23	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	149	1	Jc Mp79	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	150	1	Bath Entry Mp 80	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit	24	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	151	1	Bath G Mp78	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	23	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	152	1	Closet Mp82	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit		277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	153	1	Classroom M102	1844T5	NR	18	18	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	34	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	154	1	Classroom M102	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	155	1	Strg Mp83	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	18	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	156	1	Tool Rm Mp84	1424T8	LP24	3	3	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	277	TRUE	20	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	157	1	Office Special Services	2434T8	LP34	1	1	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	40	277	TRUE	3	2,520	-	-	0.02	208	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	158	1	Office Special Services	2434T8	NR	4	4	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	55	277	FALSE	7	720	-	-	-	237	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	159	1	School Store Mp87	222UT8	NR	6	6	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	32	277	FALSE	3	2,520	-	-	-	851	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	160	1	School Store Mp87	CFL2X26	NR	6	6	0.0520	0.0520	CFL 2x26w	No Retrofit	32	277	FALSE	3	2,520	-	-	-	763	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	161	1	Office Mp88	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	75	277	TRUE	3	2,520	-	-	0.04	416	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	162	1	Strg Mp89	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	163	1	Student Ctr Mp90	1844T5	NR	8	8	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	102	277	FALSE	108	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A

Robbinsville School District NJ	Robbinsville High School	164	1	Student Ctr Mp90	11264T5	NR	4	4	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit		277	FALSE	108	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	165	1	Office Mp91	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	50	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	166	1	Office Mp92	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	50	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	167	1	Office Mp93	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	50	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	168	1	Strg Mp94	223UT8	NR	1	1	0.0850	0.0850	2x2, 3-Lamp U T8	No Retrofit		277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	169	1	Strg By Kitchen Mp95	2424T8	NR	2	2	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	30	277	FALSE	7	720	-	-	-	81	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	170	1	Food Svc Area Mp96	223UT8	HP32R22	10	10	0.0850	0.0610	2x2, 3-Lamp U T8	Elect. HP Bal. & (3) 2' T8's, Refl	40	277	TRUE	21	#N/A	#N/A	#N/A	0.23	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	171	1	Food Svc Area Mp96	223UT8	HP32R22	6	6	0.0850	0.0610	2x2, 3-Lamp U T8	Elect. HP Bal. & (3) 2' T8's, Refl		277	TRUE	21	#N/A	#N/A	#N/A	0.14	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	172	1	Food Svc Area Mp96	CFL20	NR	4	4	0.0200	0.0200	CFL 20w	No Retrofit		277	FALSE	21	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	173	1	Food Svc Area Mp96	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	174	1	Wash Rm Mp 97	2434T8	LP34-XL	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's, XL	25	277	TRUE	22	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	175	1	Kitchen Mp98	2434T8	LP34-XL	9	9	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's, XL	35	277	TRUE	21	#N/A	#N/A	#N/A	0.18	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	176	1	Kitchen Mp98	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	177	1	Coolers Mp99	I60	LED14-A19	2	2	0.0600	0.0135	Inc 60w	LED 14w		120	TRUE	21	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	178	1	Office Food Svcs Mp100	2434T8	NP24R24	1	1	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	36	277	TRUE	3	2,520	-	-	0.03	208	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	179	1	Strg In Kitchen Mp101	223UT8	NR	1	1	0.0850	0.0850	2x2, 3-Lamp U T8	No Retrofit	33	277	FALSE	7	720	-	-	-	59	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	180	1	Strg In Kitchen Mp102	2434T8	NR	3	3	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit		277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	181	1	Jc Mp103	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	18	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	182	1	Bath Mp104	222UT8	NR	1	1	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	17	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	183	1	Short Hall By Jc	2434T8	NP24R24	2	2	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	40	277	TRUE	1	8,760	-	-	0.07	1,445	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	184	1	Short Hall By Jc	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	185	1	Hall Mp106	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	15	277	TRUE	11	2,160	-	-	0.14	712	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	186	1	Hall Mp106	1424T8	LP24	3	3	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	150	277	TRUE	11	2,160	-	-	0.04	365	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	187	1	Hall Mp106	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	188	1	Maintenance Mp107	1424T8	LP24	7	7	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	28	277	TRUE	4	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	189	1	Maint Strg Mp108	1424T8	LP24	8	8	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	21	277	TRUE	4	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	190	1	Maint Strg Mp108	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	21	277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	191	1	Elec Mp109	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	192	1	Stage Strg Mp110	1424T8	LP24	3	3	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	1	8,760	-	-	0.04	1,479	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	193	1	Classroom E102	11264T5DS	NR	5	5	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	50	277	FALSE	20	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	194	1	Classroom E102	1844T5DS	NR	10	10	0.2280	0.2280	1x8, 4-Lamp T5, DS	No Retrofit		277	FALSE	1	8,760	-	-	-	19,374	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	195	1	Classroom E102	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	196	1	Strg Mp111	2434T8	NR	3	3	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	45	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	197	1	Hall	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	48	277	TRUE	11	2,160	-	-	0.10	534	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	198	1	Hall	2434T8	NP24R24	2	2	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl		277	TRUE	1	8,760	-	-	0.07	1,445	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	199	1	Hall	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	200	1	Practice Rm Mp113	1424T8	LP24	4	4	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	75	277	TRUE	20	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	201	1	Practice Rm Mp114	1424T8	LP24	4	4	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	75	277	TRUE	20	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	202	1	Practice Rm Mp115	1424T8	LP24	4	4	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	75	277	TRUE	20	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	203	1	Office116	2434T8	LP34	4	4	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	47	277	TRUE	3	2,520	-	-	0.08	831	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	204	1	Mixing Rm Mp117	2434T8	LP34	3	3	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	28	277	TRUE	20	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	205	1	Ensemble Rm Mp118	2434T8	LP34	9	9	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's		277	TRUE	20	#N/A	#N/A	#N/A	0.18	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	206	1	Band Room E104	11264T5DS	NR	8	8	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	66	277	FALSE	20	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	207	1	Band Room E104	11264T5DS	NR	16	16	0.3420	0.3420	1x12,(6) 4'-Lamp T5, DS	No Retrofit	66	277	FALSE	20	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	208	1	Band Room E104	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	209	1	Strg Mp119	2424T8	NR	6	6	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	38	277	FALSE	7	720	-	-	-	243	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	210	1	Strg Mp120	2434T8	NR	3	3	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	38	277	FALSE	7	720	-	-	-	178	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	211	1	Hall Mp121	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	24	277	TRUE	11	2,160	-	-	0.10	534	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	212	1	Hall Mp121	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit	24	277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	213	1	Bath G Mp 123	222UT8	NP32R22	2	2	0.0580	0.0480	2x2, 2-Lamp U T8	Elect. NP Bal. & (3) 2' T8's, Refl	20	277	TRUE	14	2,520	-	-	0.02	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	214	1	Bath G Mp 123	222UT8	NP32R22	1	1	0.0580	0.0480	2x2, 2-Lamp U T8	Elect. NP Bal. & (3) 2' T8's, Refl	20	277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	215	1	Bath G Mp 123	222UT8	NP32R22	2	2	0.0580	0.0480	2x2, 2-Lamp U T8	Elect. NP Bal. & (3) 2' T8's, Refl	20	277	TRUE	14	2,520	-	-	0.02	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	216	1	Bath G Mp 123	222UT8	NP32R22	1	1	0.0580	0.0480	2x2, 2-Lamp U T8	Elect. NP Bal. & (3) 2' T8's, Refl	20	277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	217	1	Strg Clothes Mo 123	1424T8	LP24	4	4	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	2	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	218	1	Strg Clothes Mo 123	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	219	1	Strg Mp124	2434T8	NR	2	2	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	35	277	FALSE	7	720	-	-	-	119	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	220	1	Strg Mp125	2434T8	NR	4	4	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	41	277	FALSE	7	720	-	-	-	237	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	221	1	Control Rm Mp126	2434T8	LP34	4	4	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	26	277	TRUE	20	#N/A	#N/A	#N/A	0.08	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	222	1	Theater E10	1424T8	LP24	4	4	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	2	277	TRUE	2	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	223	1	Theater E10	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit	2	277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	224	1	Strg Mp127	1424T8	NR	2	2	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	7	720	-	-	-	81	-	-	-	$ -

Robbinsville School District NJ	Robbinsville High School	225	1	Strg Mp 128	1424T8	NR	4	4	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	14	277	FALSE	7	720	-	-	-	162	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	226	1	Strg Mp 129	1424T8	NR	4	4	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	14	277	FALSE	7	720	-	-	-	162	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	227	1	Tickets Mp130	2434T8	NP24R24	2	2	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl		277	TRUE	2	#N/A	#N/A	#N/A	0.07	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	228	1	Tickets Mp130	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	2	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	229	1	Bath B Mp131	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	29	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	230	1	Bath B Mp131	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	1	8,760	-	-	0.03	986	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	231	1	Entry To Lockers Mp132	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	23	277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	232	1	Srrg Mp133	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	233	1	Locker B Mp134	1414T8	LP14	2	2	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8		277	TRUE	1	8,760	-	-	0.02	544	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	234	1	Locker B Mp134	1824T8	LP24	6	6	0.0580	0.0430	1x8, 2-Lamp T8 4'	Elect. LP Bal. & (2) 4' T8's	12	277	TRUE	22	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	235	1	Locker B Mp134	1414T8	LP14	4	4	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8		277	TRUE	22	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	236	1	Locker B Mp134	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	237	1	Bath Mp 135	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	74	277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	238	1	Bath Mp 135	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	74	277	TRUE	14	2,520	-	-	0.01	142	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	239	1	Bath Mp 135	1844T8	LP44	4	4	0.1120	0.0860	1x8, 4-Lamp T8 4'	Elect. LP Bal. & (4) 4' T8's	74	277	TRUE	14	2,520	-	-	0.10	1,095	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	240	1	Locker B Mp136	1824T8	LP24	4	4	0.0580	0.0430	1x8, 2-Lamp T8 4'	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	22	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	241	1	Locker B Mp136	1414T8	LP14	2	2	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8		277	TRUE	1	8,760	-	-	0.02	544	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	242	1	Locker B Mp136	1414T8	LP14	5	5	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8	16	277	TRUE	22	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	243	1	Locker B Mp136	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	244	1	Showers Mp137	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	18	277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	245	1	Showers Mp137	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	6	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	246	1	Showers Mp137	CFL18	NR	16	16	0.0180	0.0180	CFL 18w	No Retrofit	15	277	FALSE	6	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	247	1	Office Mp138	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	277	TRUE	103	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	248	1	Shower Mp139	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	22i	277	FALSE	105	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	249	1	Shower Mp139	CFL18	NR	1	1	0.0180	0.0180	CFL 18w	No Retrofit	22i	277	FALSE	105	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	250	1	Bath W	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	42	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	251	1	Weight Rm Mp141	1414T8	LP14	4	4	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8	18	277	TRUE	22	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	252	1	Weight Rm Mp141	1414T8	LP14	12	12	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8	18	277	TRUE	22	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	253	1	Bath Mp144	1414T8	LP14	1	1	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8	24	277	TRUE	14	2,520	-	-	0.01	78	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	254	1	Bath Mp144	CFL18	NR	1	1	0.0180	0.0180	CFL 18w	No Retrofit	22	277	FALSE	14	2,520	-	-	-	44	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	255	1	Training Rm Mp143	1414T8	LP14	6	6	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8	16	277	TRUE	22	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	256	1	Strg Mp145	223UT8	NR	2	2	0.0850	0.0850	2x2, 3-Lamp U T8	No Retrofit	32	277	FALSE	7	720	-	-	-	119	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	257	1	Strg Mp145	2434T8	NR	2	2	0.0850	0.0850	2x4, 3-Lamp, T8	No Retrofit	50	277	FALSE	7	720	-	-	-	119	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	258	1	Srrg Mp147	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	259	1	Locker G Mp148	1414T8	LP14	2	2	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8		277	TRUE	1	8,760	-	-	0.02	544	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	260	1	Locker G Mp148	1824T8	LP24	6	6	0.0580	0.0430	1x8, 2-Lamp T8 4'	Elect. LP Bal. & (2) 4' T8's	12	277	TRUE	22	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	261	1	Locker G Mp148	1414T8	LP14	4	4	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8		277	TRUE	22	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	262	1	Locker G Mp148	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	263	1	Bath 149	1424T8	LP24	5	5	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	45	277	TRUE	14	2,520	-	-	0.07	709	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	264	1	Bath 149	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	265	1	Showers	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	35	277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	266	1	Showers	1424T8	LP24	3	3	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	6	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	267	1	Office Mp151	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	25	277	TRUE	103	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	268	1	Bath Mp152	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	22i	277	TRUE	5	#N/A	#N/A	#N/A	0.01	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	269	1	Shower Mp153	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	22i	277	FALSE	105	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	270	1	Shower Mp153	CFL18	NR	1	1	0.0180	0.0180	CFL 18w	No Retrofit	22i	277	FALSE	105	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	271	1	Locker Mp154	1824T8	LP24	4	4	0.0580	0.0430	1x8, 2-Lamp T8 4'	Elect. LP Bal. & (2) 4' T8's	16	277	TRUE	22	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	272	1	Locker Mp154	1414T8	LP14	3	3	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8	16	277	TRUE	22	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	273	1	Locker Mp154	1414T8	LP14	2	2	0.0320	0.0220	1x4, 1-Lamp T8	Elect. LP Bal. & (1) 4' T8	16	277	TRUE	1	8,760	-	-	0.02	544	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	274	1	Locker Mp154	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	275	1	Bath G Mp155	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	20	277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	276	1	Bath G Mp155	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	277	1	Faculty Dining	222UT8	NR	12	12	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	14	277	FALSE	21	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	278	1	Faculty Dining	222UT8	NP32R22	1	1	0.0580	0.0480	2x2, 2-Lamp U T8	Elect. NP Bal. & (3) 2' T8's, Refl		277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	279	1	Faculty Dining	VEND-CD	NR	1	1	0.3390	0.3390	Cold Drink Machine	No Retrofit		277	FALSE	1	8,760	-	-	-	2,881	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	280	1	Faculty Dining	VEND-SN	NR	1	1	0.0410	0.0410	Snack Machine	No Retrofit		277	FALSE	1	8,760	-	-	-	348	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	281	1	Faculty Dining	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	282	1	Bath Mp157	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	40	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	283	1	Bath Mp158	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	40	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	284	1	Mechanical Mp159	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	285	1	Mechanical Mp159	1424T8	NR	5	5	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	27	277	FALSE	7	720	-	-	-	203	-	-	-	$ -

Robbinsville School District NJ	Robbinsville High School	286	1	Mechanical Mp159	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	287	1	Mechanical Mp160	1424T8	LP24	3	3	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	1	8,760	-	-	0.04	1,479	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	288	1	Mechanical Mp160	1424T8	NR	15	15	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	15	277	FALSE	7	720	-	-	-	608	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	289	1	Mechanical Mp160	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	290	1	Elec Room Mp161	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	291	1	Elec Room Mp161	1424T8	NR	2	2	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	24	277	FALSE	7	720	-	-	-	81	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	292	1	Elec Room Mp161	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	293	1	Generator Pad Mp163	M175	IND80WP-PC	2	2	0.2100	0.0830	MH 175w	Induction 80w Wallpack		277	TRUE	10	1,260	-	-	0.25	513	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	294	1	Strg Mp162	1424T8	NR	6	6	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	7	720	-	-	-	243	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	295	1	Strg Mp162	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	296	1	Hall A	222UT8	NR	14	14	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	11	2,160	-	-	-	1,701	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	297	1	Hall A	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	298	1	Hall A	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	299	1	Hall B	222UT8	NR	14	14	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	11	2,160	-	-	-	1,701	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	300	1	Hall B	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	301	1	Hall B	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	302	1	Hall C	CFL2X26	NR	11	11	0.0520	0.0520	CFL 2x26w	No Retrofit	13	277	FALSE	11	2,160	-	-	-	1,198	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	303	1	Hall C	CFL2X26	NR	6	6	0.0520	0.0520	CFL 2x26w	No Retrofit	13	277	FALSE	1	8,760	-	-	-	2,651	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	304	1	Hall C	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	305	1	Hall C Display	I50MR16	LED5MR16	8	8	0.0500	0.0050	Inc 50w, MR16	LED 5w R20		120	TRUE	11	2,160	-	-	0.35	838	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	306	1	Hall D	1414BIAX	NR	17	17	0.0770	0.0770	1x4 (1) lamp biax	No Retrofit	10	277	FALSE	11	2,160	-	-	-	2,743	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	307	1	Hall D	1414BIAX	NR	3	3	0.0770	0.0770	1x4 (1) lamp biax	No Retrofit	10	277	FALSE	1	8,760	-	-	-	1,963	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	308	1	Hall D-display Case	1313	LP13	14	14	0.0410	0.0210	1x3, 1-Lamp	Elect. LP Bal. & (1) 3' T8	10	277	TRUE	1	8,760	-	-	0.27	4,877	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	309	1	Hall E	CFL2X26	NR	9	9	0.0520	0.0520	CFL 2x26w	No Retrofit	14	277	FALSE	11	2,160	-	-	-	981	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	310	1	Hall E	CFL2X26	NR	4	4	0.0520	0.0520	CFL 2x26w	No Retrofit	14	277	FALSE	1	8,760	-	-	-	1,767	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	311	1	Hall E	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	312	1	Hall F	222UT8	NR	15	15	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	11	2,160	-	-	-	1,823	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	313	1	Hall F	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	314	1	Hall F	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	315	1	Hall G	222UT8	NR	15	15	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	11	2,160	-	-	-	1,823	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	316	1	Hall G	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	317	1	Hall G	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	318	1	Hall H	1414BIAX	NR	12	12	0.0770	0.0770	1x4 (1) lamp biax	No Retrofit	10	277	FALSE	11	2,160	-	-	-	1,936	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	319	1	Hall H	1414BIAX	NR	4	4	0.0770	0.0770	1x4 (1) lamp biax	No Retrofit	10	277	FALSE	1	8,760	-	-	-	2,617	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	320	1	Hall I	CFL2X26	NR	6	6	0.0520	0.0520	CFL 2x26w	No Retrofit	12	277	FALSE	11	2,160	-	-	-	654	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	321	1	Hall I	CFL2X26	NR	2	2	0.0520	0.0520	CFL 2x26w	No Retrofit	12	277	FALSE	1	8,760	-	-	-	884	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	322	1	Hall J	222UT8	NR	12	12	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	19	277	FALSE	11	2,160	-	-	-	1,458	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	323	1	Hall J	222UT8	NR	3	3	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	19	277	FALSE	1	8,760	-	-	-	1,479	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	324	1	Hall J	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	325	1	Hall H Display Case	1313	LP13	8	8	0.0410	0.0210	1x3, 1-Lamp	Elect. LP Bal. & (1) 3' T8	13	277	TRUE	1	8,760	-	-	0.16	2,787	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	326	1	Hall K	222UT8	NR	10	10	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	24	277	FALSE	11	2,160	-	-	-	1,215	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	327	1	Hall K	222UT8	NR	3	3	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	24	277	FALSE	1	8,760	-	-	-	1,479	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	328	1	Hall K	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	329	1	Hall L	222UT8	NR	12	12	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	21	277	FALSE	11	2,160	-	-	-	1,458	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	330	1	Hall L	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	21	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	331	1	Hall L	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	332	1	Hall M	222UT8	NR	9	9	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	20	277	FALSE	11	2,160	-	-	-	1,094	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	333	1	Hall M	222UT8	NR	3	3	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	20	277	FALSE	1	8,760	-	-	-	1,479	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	334	1	Hall M	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	335	1	Hall N	222UT8	NR	9	9	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	20	277	FALSE	11	2,160	-	-	-	1,094	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	336	1	Hall N	222UT8	NR	3	3	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	20	277	FALSE	1	8,760	-	-	-	1,479	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	337	1	Hall N	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	338	1	Hall O	222UT8	NR	10	10	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	24	277	FALSE	11	2,160	-	-	-	1,215	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	339	1	Hall O	222UT8	NR	3	3	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	24	277	FALSE	1	8,760	-	-	-	1,479	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	340	1	Halll P	2434T8	NP24R24	11	11	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	277	TRUE	11	2,160	-	-	0.38	1,959	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	341	1	Halll P	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	277	TRUE	1	8,760	-	-	0.10	2,167	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	342	1	Halll P	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	343	1	Hall P Display	1313	LP13	16	16	0.0410	0.0210	1x3, 1-Lamp	Elect. LP Bal. & (1) 3' T8	18	277	TRUE	1	8,760	-	-	0.31	5,574	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	344	1	Halll Q	2434T8	NP24R24	8	8	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	40	277	TRUE	11	2,160	-	-	0.28	1,425	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	345	1	Halll Q	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	40	277	TRUE	1	8,760	-	-	0.10	2,167	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	346	1	Halll Q	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -

Robbinsville School District NJ	Robbinsville High School	347	1	Halll Q	VEND-CD	NR	1	1	0.3390	0.3390	Cold Drink Machine	No Retrofit		277	FALSE	1	8,760	-	-	-	2,881	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	348	1	Hall R	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	40	277	TRUE	11	2,160	-	-	0.14	712	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	349	1	Hall R	2434T8	NP24R24	3	3	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	40	277	TRUE	1	8,760	-	-	0.10	2,167	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	350	1	Hall R	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	351	1	Hall R	VEND-CD	NR	1	1	0.3390	0.3390	Cold Drink Machine	No Retrofit		277	FALSE	1	8,760	-	-	-	2,881	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	352	1	Back Entryway Bb	M175	M125K-HI	3	3	0.2100	0.1400	MH 175w	MH 125w Kit, HI	6	277	TRUE	1	8,760	-	-	0.20	5,353	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	353	1	Front Entryway Cc	M175	M125K-HI	6	6	0.2100	0.1400	MH 175w	MH 125w Kit, HI	6	277	TRUE	1	8,760	-	-	0.41	10,706	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	354	1	Auditorium Front Enty Mp 163	CFL26	NR	2	2	0.0260	0.0260	CFL 26w	No Retrofit	26	277	FALSE	9	2,520	-	-	-	127	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	355	1	Auditorium Mp164	HIR500DIM	NR	40	40	0.5000	0.5000	HAL 500w, Dim	No Retrofit	25	120	FALSE	23	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	356	1	Auditorium Mp164	K-LED	NR	8	8	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	272	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	357	1	Auditorium Mp164	HIR500DIM	NR	10	10	0.5000	0.5000	HAL 500w, Dim	No Retrofit	25	120	FALSE	23	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	358	1	Auditorium Mp164	HIR500	NR	35	35	0.5000	0.5000	HAL 500w	No Retrofit	23	120	FALSE	23	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	359	1	Auditorium Step Lts Mp164	CFL13	NR	18	18	0.0130	0.0130	CFL 13w	No Retrofit	2	277	FALSE	23	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	360	1	Auditorium Side Entrys Mp165	CFL26	NR	4	4	0.0260	0.0260	CFL 26w	No Retrofit	18	277	FALSE	23	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	361	1	Auditorium Side Entrys Mp165	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	362	1	Stage Mp166	1424T8	LP24	14	14	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	6	277	TRUE	1	8,760	-	-	0.20	6,900	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	363	1	Stage Mp166	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	364	1	Catwalks Above Auditorium Mp	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	8	277	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	365	1	Catwalks Above Auditorium Mp	I60	CF13	8	8	0.0600	0.0130	Inc 60w	Compact One Piece 13w	8	120	TRUE	7	720	-	-	0.36	335	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	366	1	Main Gym Left Mp167	M400	1464LBPSWGTG-DROP	8	8	0.4580	0.1700	MH 400w	New Low Bay w/ (2) Elect. NPPS Bal. & (6) 4' HL T8's, WG, TG	20	277	TRUE	22	#N/A	#N/A	#N/A	2.23	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	367	1	Main Gym Left Mp167	M400	DIS	3	3	0.4580	-	MH 400w	Disconnect and Remove		277	TRUE	22	#N/A	#N/A	#N/A	1.33	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	368	1	Main Gym Left Mp167	M400	1484LBPSWGTG-DROP	6	6	0.4580	0.2240	MH 400w	New Low Bay w/ (2) Elect. NPPS Bal. & (8) 4' HL T8's, WG, TG		277	TRUE	22	#N/A	#N/A	#N/A	1.36	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	369	1	Main Gym Left Mp167	NL	1484LBPSWGTG-DROP	2	2	-	0.2240	New Layout	New Low Bay w/ (2) Elect. NPPS Bal. & (8) 4' HL T8's, WG, TG		277	TRUE	22	#N/A	#N/A	#N/A	(0.43)	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	370	1	Main Gym Right Mp168	M400	1464LBPSWGTG-DROP	8	8	0.4580	0.1700	MH 400w	New Low Bay w/ (2) Elect. NPPS Bal. & (6) 4' HL T8's, WG, TG	20	277	TRUE	22	#N/A	#N/A	#N/A	2.23	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	371	1	Main Gym Right Mp168	M400	DIS	3	3	0.4580	-	MH 400w	Disconnect and Remove		277	TRUE	22	#N/A	#N/A	#N/A	1.33	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	372	1	Main Gym Right Mp168	M400	1484LBPSWGTG-DROP	6	6	0.4580	0.2240	MH 400w	New Low Bay w/ (2) Elect. NPPS Bal. & (8) 4' HL T8's, WG, TG		277	TRUE	22	#N/A	#N/A	#N/A	1.36	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	373	1	Main Gym Right Mp168	NL	1484LBPSWGTG-DROP	2	2	-	0.2240	New Layout	New Low Bay w/ (2) Elect. NPPS Bal. & (8) 4' HL T8's, WG, TG		277	TRUE	22	#N/A	#N/A	#N/A	(0.43)	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	374	1	Main Gym All Mp168	K-LED	NR	8	8	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	272	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	375	1	Auxilliary Gym Mp169	M400	1464LBPSWGTG-OS	12	12	0.4580	0.1700	MH 400w	New Low Bay w/ (2) Elect. NPPS Bal. & (6) 4' HL T8's, WG, TG, OS	12	277	TRUE	22	#N/A	#N/A	#N/A	3.35	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	376	1	Auxilliary Gym Mp170	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	377	1	Cafeteria Mp171	HIR500DIM	NR	42	42	0.5000	0.5000	HAL 500w, Dim	No Retrofit	13	120	FALSE	16	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	378	1	Cafeteria Mp171	M175-BO	DIS-RNDCP-HI	28	28	0.0600	-	MH 175w, BO	Disconnect and Remove, HI		277	TRUE	16	#N/A	#N/A	#N/A	1.63	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	379	1	Cafeteria Mp171	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	380	2	Bath B	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	20	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	381	2	Entry To Bath	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	9	2,520	-	-	-	127	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	382	2	Jc	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	383	2	Entry To Bath	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	9	2,520	-	-	-	127	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	384	2	Bath B	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	20	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	385	2	Mech Rm Mp177	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	386	2	Mech Rm Mp177	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	14	277	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	387	2	Elec Mp178	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	388	2	Strg	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	24	277	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	389	2	Classroom B202	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	390	2	Classroom B202	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	391	2	Classroom B202	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	392	2	Classroom B204	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	393	2	Classroom B204	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	394	2	Classroom B204	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	395	2	Faculty Rm Mp180	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	1	8,760	-	-	-	442	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	396	2	Faculty Rm Mp180	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	397	2	Faculty Rm Mp180	1844T5	NR	7	7	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	55	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	398	2	Conference Mp181	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	88	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	399	2	Conference Mp181	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	400	2	Bath Mp182	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	18	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	401	2	Strg	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	18	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	402	2	Office Mp184	1424T5	NR	3	3	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	24	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	403	2	Classroom B209	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	404	2	Classroom B209	1844T5	NR	6	6	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	405	2	Classroom B209	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	406	2	Classroom B207	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	407	2	Classroom B207	1844T5	NR	6	6	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A

Robbinsville School District NJ	Robbinsville High School	408	2	Classroom B207	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	409	2	Classroom B205	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	410	2	Classroom B205	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	411	2	Classroom B205	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	412	2	Classroom B203	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	413	2	Classroom B203	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	95	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	414	2	Classroom B203	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	415	2	Classroom B201	11264T5	NR	6	6	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	416	2	Classroom A202	11264T5	NR	6	6	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	417	2	Classroom A204	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	418	2	Classroom A204	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	419	2	Classroom A204	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	420	2	Classroom A206	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	421	2	Classroom A206	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	422	2	Classroom A206	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	423	2	Classroom A208	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	424	2	Classroom A208	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	425	2	Classroom A208	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	426	2	Classroom A210	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	427	2	Classroom A210	1844T5	NR	6	6	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	428	2	Classroom A210	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	429	2	Classroomaa209	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	1	8,760	-	-	-	442	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	430	2	Classroomaa209	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	431	2	Classrooma A209	1844T5	NR	7	7	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	55	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	432	2	Strg Mp185	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	45	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	433	2	Bath Mp186	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	434	2	Lounge Mp187	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	95	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	435	2	Lounge Mp187	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	95	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	436	2	Strg Mp188	1424T5	NR	3	3	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	51,	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	437	2	Classroom A205	1844T5	NR	6	6	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	438	2	Classroom A205	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	439	2	Classroom A205	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	440	2	Classroom A203	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	441	2	Classroom A203	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	442	2	Classroom A203	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	443	2	Classroom A201	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	444	2	Classroom A201	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	445	2	Classroom A201	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	446	2	Mech Mp189	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	277	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	447	2	Tel Rm Mp190	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	13	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	448	2	Elec Mp191	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	17	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	449	2	Office Mp192	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	40	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	450	2	Office Mp193	2434T8	LP34	2	2	0.0850	0.0640	2x4, 3-Lamp, T8	Elect. LP Bal. & (3) 4' T8's	50	277	TRUE	103	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	451	2	Kstrg Mp194	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	19	277	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	452	2	Classroom M203	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	80	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	453	2	Classroom M203	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	80	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	454	2	Classroom M203	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	455	2	Bath Mp195	222UT8	NR	1	1	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	29	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	456	2	Classroom M201	11264T5	NR	6	6	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	110	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	457	2	Classroom M201	1844T5	NR	6	6	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	110	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	458	2	Classroom M201	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	459	2	Classroom D202	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	70	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	460	2	Classroom D202	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	70	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	461	2	Classroom D202	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	462	2	Classroom D204	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	70	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	463	2	Classroom D204	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	70	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	464	2	Classroom D204	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	465	2	Classroom D206	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	70	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	466	2	Classroom D206	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	70	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	467	2	Classroom D206	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	468	2	Classroom D208	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A

Robbinsville School District NJ	Robbinsville High School	469	2	Classroom D208	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	470	2	Classroom D208	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	471	2	Office Mp196	1424T5	NR	3	3	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	58	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	472	2	Office Mp197	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	1	8,760	-	-	-	442	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	473	2	Office Mp197	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	474	2	Office Mp197	1844T5	NR	7	7	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	50	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	475	2	Office Mp197	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	476	2	Strg Mp198	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	477	2	Bath Mp199	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	31	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	478	2	Conferencemp200	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	80	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	479	2	Conferencemp200	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit		277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	480	2	Classroom D205	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	481	2	Classroom D205	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	482	2	Classroom D205	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	483	2	Classroom D203	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	484	2	Classroom D203	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	485	2	Classroom D203	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	486	2	Classroom D201	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	487	2	Classroom D201	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	488	2	Classroom D201	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	489	2	Bath Mp201	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	24	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	490	2	Entry To Bath Mp202	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	9	2,520	-	-	-	127	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	491	2	Jc	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	13	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	492	2	Entry To Bath Mp204	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	9	2,520	-	-	-	127	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	493	2	Bath Mp2015	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	24	277	TRUE	14	2,520	-	-	0.03	284	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	494	2	Strg	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	495	2	Classroom C202	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	496	2	Classroom C202	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	497	2	Classroom C202	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	498	2	Classroom C204	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	499	2	Classroom C204	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	500	2	Classroom C204	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	501	2	Classroom C206	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	502	2	Classroom C206	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	503	2	Classroom C206	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	504	2	Office Mp207	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	1	8,760	-	-	-	442	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	505	2	Office Mp207	CFL2X26	NR	1	1	0.0520	0.0520	CFL 2x26w	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	506	2	Office Mp207	1844T5	NR	7	7	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	55	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	507	2	Office Mp207	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	508	2	Strg Mp208	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	45	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	509	2	Bath Mp209	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	277	FALSE	114	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	510	2	Strg Mp210	1844T5	NR	2	2	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	511	2	Strg Mp210	1424T5	NR	2	2	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	75	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	512	2	Office Mp211	1424T5	NR	3	3	0.1140	0.1140	1x4, 2-Lamp T5	No Retrofit	35	277	FALSE	103	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	513	2	Classroom C207	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	514	2	Classroom C207	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	515	2	Classroom C207	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	516	2	Classroom C205	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	517	2	Classroom C205	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	518	2	Classroom C205	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	519	2	Classroom C203	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	520	2	Classroom C203	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	521	2	Classroom C203	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	522	2	Classroom C201	11264T5	NR	2	2	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	523	2	Classroom C201	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	75	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	524	2	Classroom C201	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit		277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	525	2	Elec Rm Mp212	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	16	277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	526	2	Strg Mp213	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		277	TRUE	1	8,760	-	-	0.01	493	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	527	2	Strg Mp213	1424T8	NR	2	2	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	277	FALSE	7	720	-	-	-	81	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	528	2	Strg Mp214	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	15	277	FALSE	107	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	529	2	Classroom M202	11264T5	NR	6	6	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	66	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A

Robbinsville School District NJ	Robbinsville High School	530	2	Classroom M204	11264T5	NR	5	5	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	94	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	531	2	Classroom M204	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	94	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	532	2	Strg Mp215	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	533	2	Control Rm Mp206	I75	CF15R30	5	5	0.0750	0.0150	Inc 75w	Compact One Piece 15w R30 Flood		120	TRUE	2	#N/A	#N/A	#N/A	0.29	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	534	2	Mech Mp217	1424T8	NR	5	5	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	30	277	FALSE	7	720	-	-	-	203	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	535	2	Classroom M207	11264T5	NR	5	5	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	100	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	536	2	Classroom M207	1844T5	NR	4	4	0.2280	0.2280	1x8, 4-Lamp T5	No Retrofit	100	277	FALSE	116	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	537	2	Classroom M205b	11264T5	NR	3	3	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	538	2	Classroom M205a	11264T5	NR	3	3	0.3420	0.3420	1x12,(6) 4'-Lamp T5	No Retrofit	75	277	FALSE	120	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Robbinsville High School	539	2	Mech Mp218	1424T8	NR	5	5	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	28	277	FALSE	7	720	-	-	-	203	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	540	2	Elec Mp219	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit		277	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	541	2	Hall S	222UT8	NR	14	14	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	11	2,160	-	-	-	1,701	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	542	2	Hall S	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	543	2	Hall S	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit	18	277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	544	2	Hall T	222UT8	NR	14	14	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	11	2,160	-	-	-	1,701	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	545	2	Hall T	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	546	2	Hall T	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit	18	277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	547	2	Hall U	CFL2X26	NR	11	11	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	11	2,160	-	-	-	1,198	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	548	2	Hall U	CFL2X26	NR	6	6	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	1	8,760	-	-	-	2,651	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	549	2	Hall U	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit	18	277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	550	2	Hall V	CFL2X26	NR	18	18	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	11	2,160	-	-	-	1,961	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	551	2	Hall V	CFL2X26	NR	6	6	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	1	8,760	-	-	-	2,651	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	552	2	Hall V	1313	LP13	12	12	0.0410	0.0210	1x3, 1-Lamp	Elect. LP Bal. & (1) 3' T8	16	277	TRUE	1	8,760	-	-	0.23	4,181	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	553	2	Hall W	CFL2X26	NR	7	7	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	11	2,160	-	-	-	763	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	554	2	Hall W	CFL2X26	NR	3	3	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	1	8,760	-	-	-	1,326	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	555	2	Hall W	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit	16	277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	556	2	Hall X	222UT8	NR	15	15	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	11	2,160	-	-	-	1,823	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	557	2	Hall X	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	558	2	Hall X	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit	16	277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	559	2	Hall Y	222UT8	NR	15	15	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	11	2,160	-	-	-	1,823	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	560	2	Hall Y	222UT8	NR	4	4	0.0580	0.0580	2x2, 2-Lamp U T8	No Retrofit	18	277	FALSE	1	8,760	-	-	-	1,971	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	561	2	Hall Y	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit	16	277	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	562	2	Hall Z	CFL2X26	NR	24	24	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	11	2,160	-	-	-	2,615	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	563	2	Hall Z	CFL2X26	NR	8	8	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	1	8,760	-	-	-	3,535	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	564	2	Hall Aa	CFL2X26	NR	21	21	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	11	2,160	-	-	-	2,288	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	565	2	Hall Aa	CFL2X26	NR	8	8	0.0520	0.0520	CFL 2x26w	No Retrofit	16	277	FALSE	11	2,160	-	-	-	872	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	566	2	Hall Aa	K-LED	NR	5	5	0.0040	0.0040	Exit Sign - LED	No Retrofit	16	277	FALSE	1	8,760	-	-	-	170	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	567	2	Stair B1	1424T8	LP24	6	6	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	11	2,160	-	-	0.09	729	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	568	2	Stair B1	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	569	2	Stair B2	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	11	2,160	-	-	0.01	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	570	2	Stair A1	1424T8	LP24	5	5	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	11	2,160	-	-	0.07	608	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	571	2	Stair A1	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	572	2	Stair A2	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	11	2,160	-	-	0.01	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	573	2	Stair C1	1424T8	LP24	6	6	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	11	2,160	-	-	0.09	729	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	574	2	Stair C1	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	575	2	Stair D1	1424T8	LP24	5	5	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	11	2,160	-	-	0.07	608	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	576	2	Stair D1	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		277	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	577	2	Stair E1	1424T8	LP24	1	1	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	15	277	TRUE	11	2,160	-	-	0.01	122	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	578	Ext	Front Canopy	H175	M150K-FCAN-HI	3	3	0.2050	0.1850	MV 175w	MH 150w Kit, FCAN, HI		277	TRUE	8	2,520	-	-	0.06	1,503	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	579	Ext	Walls	M50	NR	18	18	0.0620	0.0620	MH 50w	No Retrofit		277	FALSE	10	1,260	-	-	-	1,364	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	580	Ext	Walls	M175	IND80WP-PC	7	7	0.2100	0.0830	MH 175w	Induction 80w Wallpack		277	TRUE	10	1,260	-	-	0.86	1,797	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	581	Ext	Back Canopy	H175	M150K-FCAN-HI	1	1	0.2050	0.1850	MV 175w	MH 150w Kit, FCAN, HI		277	TRUE	8	2,520	-	-	0.02	501	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	582	Ext	Back Canopy	CFL26	NR	3	3	0.0260	0.0260	CFL 26w	No Retrofit		277	FALSE	10	1,260	-	-	-	95	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	583	Ext	Bollard	M50	NR	12	12	0.0620	0.0620	MH 50w	No Retrofit		277	FALSE	10	1,260	-	-	-	909	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	584	Ext	Front Parking Lot	M400	IND200SB-PC	12	12	0.4580	0.2150	MH 400w	Induction 200w Shoe Box		277	TRUE	10	1,260	-	-	2.83	6,717	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	585	Ext	Front Parking Lot	M2X400	IND2X200SB-PC	5	5	0.9160	0.4300	MH (2) 400w	(2) Induction 200w Shoe Box		277	TRUE	10	1,260	-	-	2.36	5,598	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	586	Ext	Side Parking Lot	M400	IND200SB-PC	2	2	0.4580	0.2150	MH 400w	Induction 200w Shoe Box		277	TRUE	10	1,260	-	-	0.47	1,120	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	587	Ext	Back Parking Lot	M400	IND200SB-PC	3	3	0.4580	0.2150	MH 400w	Induction 200w Shoe Box		277	TRUE	10	1,260	-	-	0.71	1,679	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	588	Ext	Back Parking Lot	M2X400	IND2X200SB-PC	10	10	0.9160	0.4300	MH (2) 400w	(2) Induction 200w Shoe Box		277	TRUE	10	1,260	-	-	4.71	11,195	-	-	-	$ -
Robbinsville School District NJ	Robbinsville High School	589	Ext	Roadway To Gate	M400	IND200SB-PC	17	17	0.4580	0.2150	MH 400w	Induction 200w Shoe Box		277	TRUE	10	1,260	-	-	4.01	9,516	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	1	Ext	Modular P C 1	1424T8	LP24	14	14	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	50	120	TRUE	25	#N/A	#N/A	#N/A	0.20	#N/A	#N/A	#N/A	#N/A	#N/A

Robbinsville School District NJ	Sharon Elementary-New Fixture	2	Ext	Modular P C 1	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	3	Ext	Modular P C 1	S70	NR	2	2	0.0940	0.0940	HPS 70w	No Retrofit		120	FALSE	10	1,260	-	-	-	230	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	4	Ext	Modular P T / O T	1424T8	LP24	14	14	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	50	120	TRUE	25	#N/A	#N/A	#N/A	0.20	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	5	Ext	Modular P T / O T	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	6	Ext	Modular P T / O T	S70	NR	2	2	0.0940	0.0940	HPS 70w	No Retrofit		120	FALSE	10	1,260	-	-	-	230	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	7	Ext	Modular - Yellow Exterior	S70	NR	2	2	0.0940	0.0940	HPS 70w	No Retrofit		120	FALSE	10	1,260	-	-	-	230	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	8	Ext	M Y - Bathroom Boys	2444	NP24R24	4	4	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	35	120	TRUE	15	#N/A	#N/A	#N/A	0.37	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	9	Ext	M Y - Custodian	2444	NP24R24	1	1	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	35	120	TRUE	7	720	-	-	0.09	101	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	10	Ext	M Y - Bathroom Girls	2444	NP24R24	4	4	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	35	120	TRUE	15	#N/A	#N/A	#N/A	0.37	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	11	Ext	M Y - Classroom M-2	2444	NP24R24	9	9	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	25	#N/A	#N/A	#N/A	0.83	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	12	Ext	M Y - Classroom M-4	2444	NP24R24	9	9	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	25	#N/A	#N/A	#N/A	0.83	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	13	Ext	M Y - Classroom M-5	2444	NP24R24	9	9	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	25	#N/A	#N/A	#N/A	0.83	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	14	Ext	M Y - Classroom M-3	2444	NP24R24	9	9	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	25	#N/A	#N/A	#N/A	0.83	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	15	Ext	M Y - Classroom M-1	2444	NP24R24	9	9	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	25	#N/A	#N/A	#N/A	0.83	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	16	Ext	M Y - Hallway	2444	NP24R24	10	10	0.1440	0.0490	2x4, 4-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	28	#N/A	#N/A	#N/A	0.92	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	17	Ext	M Y - Hallway	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	18	1	Classroom A-25	2424T8	NR	12	12	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	20	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	19	1	Bathroom - Classroom A-25	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit	27	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	20	1	Classroom A-24	2424T8	NR	12	12	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	25	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	21	1	Bathroom - Classroom A-24	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit	27	120	FALSE	15	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	22	1	Classroom A-23	2424T8	NR	12	12	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	25	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	23	1	Bathroom - Classroom A-23	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit	27	120	FALSE	15	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	24	1	Classroom A-22	2424T8	NR	12	12	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	25	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	25	1	Bathroom - Classroom A-22	1414T8	NR	1	1	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit	27	120	FALSE	15	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	26	1	Hallway Kindergarten	2424T8	NR	5	5	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	25	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	27	1	Hallway Kindergarten	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	28	1	Hallway Ramp / Lobby	2424T8	NR	6	6	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	25	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	29	1	Hallway Ramp / Lobby	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	30	1	Classroom A-21	2424T8	NR	6	6	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	20	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	31	1	Bathroom Handicap	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w	18	120	TRUE	5	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	32	1	Classroom A-19	2424T8	NR	8	8	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	23	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	33	1	Classroom A-17	2424T8	NR	8	8	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	23	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	34	1	Classroom A-15	1424T8	2424TGR	12	12	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	25	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	35	1	Copy Room	2444T8	LP44	3	3	0.1120	0.0860	2x4, 4-Lamp T8	Elect. LP Bal. & (4) 4' T8's	78	120	TRUE	8	2,520	-	-	0.08	821	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	36	1	Bathroom Girls	1434T8	LP34	3	3	0.0850	0.0640	1x4, 3-Lamp T8	Elect. LP Bal. & (3) 4' T8's	45	120	TRUE	15	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	37	1	Bathroom Girls	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit		120	FALSE	15	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	38	1	Closet Custodial	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	18	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	39	1	Bathroom Boys	1434T8	LP34	3	3	0.0850	0.0640	1x4, 3-Lamp T8	Elect. LP Bal. & (3) 4' T8's	45	120	TRUE	15	#N/A	#N/A	#N/A	0.06	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	40	1	Bathroom Boys	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit		120	FALSE	15	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	41	1	Boiler Room	1424	LP24	4	4	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	28	120	TRUE	7	720	-	-	0.11	201	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	42	1	Boiler Room	1828	NP24K18	3	3	0.1260	0.0490	1x8, 2-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	28	120	TRUE	7	720	-	-	0.22	264	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	43	1	Classroom A-6	2424T8	NR	9	9	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	34	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	44	1	Classroom A-8	2424T8	NR	9	9	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	34	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	45	1	Classroom A-10	1424T8	2424TGR	15	15	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	25	#N/A	#N/A	#N/A	0.13	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	46	1	Classroom A-12	2434	NP24R24	9	9	0.1140	0.0490	2x4, 3-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	42	120	TRUE	25	#N/A	#N/A	#N/A	0.57	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	47	1	Classroom A-14	2434	NP24R24	9	9	0.1140	0.0490	2x4, 3-Lamp	Elect. NP Bal. & (2) 4' T8's, Refl	42	120	TRUE	25	#N/A	#N/A	#N/A	0.57	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	48	1	Classroom A-16	2424T8	NR	9	9	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	20	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	49	1	Classroom A-18	2424T8	NR	9	9	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	15	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	50	1	Classroom A-20	2424T8	NR	9	9	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	15	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	51	1	Hallway A-21 To A-2	1424T8	2424TGR	14	14	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	35	120	TRUE	28	#N/A	#N/A	#N/A	0.12	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	52	1	Hallway A-21 To A-2	1222T8	LP22	14	14	0.0340	0.0280	1x2, 2-Lamp T8	Elect. LP Bal. & (2) 2' T8's	28	120	TRUE	28	#N/A	#N/A	#N/A	0.08	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	53	1	Hallway A-21 To A-2	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	54	1	Main Entry Lobby	2444T8	NP24R24	6	6	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl		120	TRUE	28	#N/A	#N/A	#N/A	0.37	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	55	1	Main Entry Lobby	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	56	1	Classroom A-5	1424T8	2424TGR	12	12	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	25	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	57	1	Bathroom Faculty	I2X75	CF2X23	2	2	0.1500	0.0460	Inc (2) 75w	(2) Compact One Piece 23w	20	120	TRUE	5	#N/A	#N/A	#N/A	0.20	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	58	1	Classroom A-3	2424T8	NR	9	9	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	20	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	59	1	Classroom A-2	2424T8	NR	13	13	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	30	120	FALSE	25	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	60	1	Bathroom Classroom A-2	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w	18	120	TRUE	5	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	61	1	Office Mcgrath	2444T8	NP24R24	3	3	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	3	2,520	-	-	0.18	821	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	62	1	Office Principal	2434T8	NP24R24	4	4	0.0850	0.0490	2x4, 3-Lamp, T8	Elect. NP Bal. & (2) 4' T8's, Refl	43	120	TRUE	3	2,520	-	-	0.14	831	-	-	-	$ -

Robbinsville School District NJ	Sharon Elementary-New Fixture	63	1	Main Office Copy	1424T8	2424TGR	1	1	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	3	2,520	-	-	0.01	142	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	64	1	Closet Supply Main Office	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w	13	120	TRUE	7	720	-	-	0.05	52	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	65	1	Closet Paper Main Office	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w	13	120	TRUE	7	720	-	-	0.05	52	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	66	1	Bathroom Main Office	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w	13	120	TRUE	6	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	67	1	Bathroom Main Office	I2X75	CF2X23	1	1	0.1500	0.0460	Inc (2) 75w	(2) Compact One Piece 23w	20	120	TRUE	6	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	68	1	Closet Binders Main Office	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w	13	120	TRUE	7	720	-	-	0.05	52	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	69	1	Main Office	2444T8	NP24R24	7	7	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	70	120	TRUE	3	2,520	-	-	0.43	1,916	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	70	1	Main Office	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	45	120	TRUE	3	2,520	-	-	0.03	142	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	71	Ext	Courtyard	I3X75	CF3X23	1	1	0.2250	0.0690	Inc (3) 75w	(3) Compact One Piece 23w		120	TRUE	10	1,260	-	-	0.15	275	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	72	1	Closet Books	I75	CF23	2	2	0.0750	0.0230	Inc 75w	Compact One Piece 23w	8	120	TRUE	7	720	-	-	0.10	105	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	73	1	Bathroom Girls	1434T8	LP34	2	2	0.0850	0.0640	1x4, 3-Lamp T8	Elect. LP Bal. & (3) 4' T8's	45	120	TRUE	15	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	74	1	Closet Custodian	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w	8	120	TRUE	7	720	-	-	0.05	52	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	75	1	Bathroom Boys	1434T8	LP34	2	2	0.0850	0.0640	1x4, 3-Lamp T8	Elect. LP Bal. & (3) 4' T8's	45	120	TRUE	15	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	76	1	Hallway Main To D-1	1424T8	2424TGR	5	5	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	25	120	TRUE	28	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	77	1	Hallway Main To D-1	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	78	1	Hallway Main To D-1	I150	2222TGR	5	5	0.1500	0.0320	Inc 150w	New 2x2 w/ Elect. NP Bal. & (2) 2' T8's, Refl	8	120	TRUE	28	#N/A	#N/A	#N/A	0.57	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	79	1	Classroom D-4	1424T8	2424TGR	15	15	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	25	#N/A	#N/A	#N/A	0.13	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	80	1	Office D-2	1424T8	2424TGR	3	3	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	36	120	TRUE	3	2,520	-	-	0.03	425	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	81	1	Classroom C-2	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	82	1	Classroom C-4	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	83	1	Classroom C-6	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	84	1	Classroom C-1	1424T8	2424TGR	12	12	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	25	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	85	1	Closet Classroom C-1	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w		120	TRUE	7	720	-	-	0.05	52	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	86	1	Hallway C-wing	1424T8	2424TGR	6	6	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl		120	TRUE	28	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	87	1	Classroom B-12	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	88	1	Classroom B-10	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	45	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	89	1	Classroom B-8	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	45	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	90	1	Classroom B6	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	45	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	91	1	Classroom B4	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	45	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	92	1	Classroom B-2	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	45	120	TRUE	25	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	93	1	Hallway B-wing	1424T8	2424TGR	10	10	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	30	120	TRUE	28	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	94	1	Hallway B-wing	2222T8	LP22	2	2	0.0340	0.0280	2x2, 2-Lamp T8	Elect. LP Bal. & (2) 2' T8's		120	TRUE	28	#N/A	#N/A	#N/A	0.01	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	95	1	Hallway B-wing	I150	2222TGR	2	2	0.1500	0.0320	Inc 150w	New 2x2 w/ Elect. NP Bal. & (2) 2' T8's, Refl	8	120	TRUE	28	#N/A	#N/A	#N/A	0.23	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	96	1	Hallway B-wing	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	97	1	Classroom B-5	1424T8	2424TGR	12	12	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	42	120	TRUE	25	#N/A	#N/A	#N/A	0.10	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	98	1	Classroom B7	1424T8	2424TGR	8	8	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	85	120	TRUE	25	#N/A	#N/A	#N/A	0.07	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	99	1	Closet Supply	1424	LP24	1	1	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	18	120	TRUE	7	720	-	-	0.03	50	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	100	1	Bathroom Girls	1434T8	LP34	2	2	0.0850	0.0640	1x4, 3-Lamp T8	Elect. LP Bal. & (3) 4' T8's	45	120	TRUE	15	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	101	1	Closet Custodian	CFL26	NR	1	1	0.0260	0.0260	CFL 26w	No Retrofit		120	FALSE	7	720	-	-	-	18	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	102	1	Bathroom Boys	1434T8	LP34	2	2	0.0850	0.0640	1x4, 3-Lamp T8	Elect. LP Bal. & (3) 4' T8's	45	120	TRUE	15	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	103	1	Hallway New Wing	2424T8	LP24	3	3	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	35	120	TRUE	28	#N/A	#N/A	#N/A	0.04	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	104	1	Hallway New Wing	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	105	1	Atrium	CFL26	NR	6	6	0.0260	0.0260	CFL 26w	No Retrofit	45	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	106	1	Atrium	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	107	1	Classroom E-2	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	108	1	Classroom E-4	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	109	1	Foyer	CFL2X13	NR	2	2	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	110	1	Classroom E-6	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	111	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	112	1	Classroom E-8	2444T8	NP24R24	6	6	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.37	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	113	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	114	1	Bathroom Girls	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	35	120	TRUE	15	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	115	1	Bathroom Girls	2424T8	LP24	2	2	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	35	120	TRUE	15	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	116	1	Bathroom Girls	1414T8	NR	3	3	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit	35	120	FALSE	15	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	117	1	Closet Custodian	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	85	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	118	1	Bathroom Boys	222UT8	NP22R22	1	1	0.0580	0.0320	2x2, 2-Lamp U T8	Elect. NP Bal. & (2) 2' T8's, Refl	35	120	TRUE	15	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	119	1	Bathroom Boys	2424T8	LP24	2	2	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	35	120	TRUE	15	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	120	1	Bathroom Boys	1414T8	NR	2	2	0.0320	0.0320	1x4, 1-Lamp T8	No Retrofit	35	120	FALSE	15	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	121	1	Closet Comms	1424T8	NR	1	1	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	85	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	122	1	Classroom E-10	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	123	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A

Robbinsville School District NJ	Sharon Elementary-New Fixture	124	1	Classroom E-12	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	125	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	126	1	Classroom E-14	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	127	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	128	1	Classroom E-16	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	129	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	130	1	Gymnasium	M250	1484LBPSWGTG	18	18	0.2950	0.2240	MH 250w	New Low Bay w/ (2) Elect. NPPS Bal. & (8) 4' HL T8's, WG, TG	14	120	TRUE	27	#N/A	#N/A	#N/A	1.24	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	131	1	Gymnasium	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	136	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	132	1	E 15.1 Gym Storage	1424T8	NR	3	3	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	25	120	FALSE	7	720	-	-	-	122	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	133	1	0ffice E-15.2	2444T8	NP24R24	2	2	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	3	2,520	-	-	0.12	548	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	134	1	Bathroom 0ffice E-15.2	2424T8	LP24	1	1	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	35	120	TRUE	5	#N/A	#N/A	#N/A	0.01	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	135	1	Mechanical Room	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	1	8,760	-	-	0.03	986	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	136	1	Mechanical Room	1424T8	NR	4	4	0.0580	0.0580	1x4, 2-Lamp T8	No Retrofit	30	120	FALSE	7	720	-	-	-	162	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	137	1	Foyer Gym	CFL2X13	NR	3	3	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	12	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	138	1	Classroom E-13	2444T8	NP24R24	6	6	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.37	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	139	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	140	1	Classroom E-11	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	24	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	141	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	142	1	Classroom E-9	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	143	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	144	1	Classroom E-7	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	145	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	146	1	Classroom E-5	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	147	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	148	1	Classroom E-1	2444T8	NP24R24	9	9	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	51	120	TRUE	25	#N/A	#N/A	#N/A	0.55	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	149	1	Foyer	CFL2X13	NR	1	1	0.0260	0.0260	CFL (2) 13w	No Retrofit	17	120	FALSE	28	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	150	1	Media Center	1434T8	2434TGR	36	36	0.0850	0.0700	1x4, 3-Lamp T8	New 2x4 w/ Elect. NP Bal. & (3) 4' T8's, Refl	46	120	TRUE	8	2,520	-	-	0.52	7,480	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	151	1	Media Center - Cove Lights	1424T8	LP24	60	60	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	46	120	TRUE	8	2,520	-	-	0.87	8,507	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	152	1	Media Center - Cove Lights	1222T8	NR	4	4	0.0340	0.0340	1x2, 2-Lamp T8	No Retrofit	46	120	FALSE	8	2,520	-	-	-	332	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	153	1	Media Center Sconces	CFL36	NR	10	10	0.0360	0.0360	CFL 36w	No Retrofit	40	120	FALSE	8	2,520	-	-	-	880	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	154	1	Media Center - Small Cans 14'	M35	NR	4	4	0.0670	0.0670	MH 35w	No Retrofit	40	120	FALSE	8	2,520	-	-	-	655	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	155	1	Media Center - Large Cans 14'	M70	NR	9	9	0.0950	0.0950	MH 70w	No Retrofit	40	120	FALSE	8	2,520	-	-	-	2,090	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	156	1	Media Center - Large Cans 24'	M70	NR	18	18	0.0950	0.0950	MH 70w	No Retrofit	65	120	FALSE	8	2,520	-	-	-	4,180	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	157	1	Media Center - Decorative Chandeliers	CFL4X40	NR	2	2	0.1600	0.1600	CFL (4) 40w	No Retrofit	65	120	FALSE	8	2,520	-	-	-	782	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	158	1	Media Center - Entry	CFL2X13	NR	6	6	0.0260	0.0260	CFL (2) 13w	No Retrofit	30	120	FALSE	8	2,520	-	-	-	381	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	159	1	Media Center - Hall Foyer	CFL2X13	NR	2	2	0.0260	0.0260	CFL (2) 13w	No Retrofit	30	120	FALSE	8	2,520	-	-	-	127	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	160	1	Media Center Exit Signs	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	102	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	161	1	Media Center Room - E 3.2	2444T8	NP24R24	6	6	0.1120	0.0490	2x4, 4-Lamp T8	Elect. NP Bal. & (2) 4' T8's, Refl	65	120	TRUE	3	2,520	-	-	0.37	1,643	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	162	1	Media Center Computer Room	1434T8	2434TGR	16	16	0.0850	0.0700	1x4, 3-Lamp T8	New 2x4 w/ Elect. NP Bal. & (3) 4' T8's, Refl	70	120	TRUE	25	#N/A	#N/A	#N/A	0.23	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	163	1	Hallway E-wing	2424T8	LP24	32	32	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	31	120	TRUE	28	#N/A	#N/A	#N/A	0.47	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	164	1	Hallway E-wing	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	165	1	Cafeteria	M400	1464LBPSWG	12	12	0.4580	0.1730	MH 400w	New Low Bay w/ (2) Elect. NPPS Bal. & (6) 4' HL T8's, WG, TG	30	120	TRUE	12	#N/A	#N/A	#N/A	3.32	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	166	1	Cafeteria	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	167	1	Closet Cafeteria	2424T8	NR	1	1	0.0580	0.0580	2x4, 2-Lamp T8	No Retrofit	21	120	FALSE	7	720	-	-	-	41	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	168	1	Kitchen Serving	2424T8	LP24	6	6	0.0580	0.0430	2x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's	31	120	TRUE	12	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	169	1	Hood	I75	CF23	2	2	0.0750	0.0230	Inc 75w	Compact One Piece 23w		120	TRUE	7	720	-	-	0.10	105	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	170	1	Prep Kitchen	1424T8	2424TGR	4	4	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	27	120	TRUE	26	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	171	1	Prep Kitchen	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	172	1	Tray Storge	2222T8	LP22	1	1	0.0340	0.0280	2x2, 2-Lamp T8	Elect. LP Bal. & (2) 2' T8's	23	120	TRUE	26	#N/A	#N/A	#N/A	0.01	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	173	1	Bathroom Kitchen	I75	CF23	1	1	0.0750	0.0230	Inc 75w	Compact One Piece 23w	17	120	TRUE	5	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	174	1	Estimate - Pantry	1424T8	LP24	2	2	0.0580	0.0430	1x4, 2-Lamp T8	Elect. LP Bal. & (2) 4' T8's		120	TRUE	26	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	175	1	Dishwashing	1424T8	2424TGR	2	2	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	24	120	TRUE	26	#N/A	#N/A	#N/A	0.02	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	176	1	Faculty Lounge	1424T8	2424TGR	8	8	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	40	120	TRUE	8	2,520	-	-	0.07	1,134	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	177	1	Hallway Maint	1424T8	2424TGR	2	2	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	24	120	TRUE	28	#N/A	#N/A	#N/A	0.02	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	178	1	Hallway Maint	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	179	1	Maintenance Shop	1424T8	2424TGR	13	13	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	45	120	TRUE	8	2,520	-	-	0.11	1,843	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	180	1	Maintenance Shop	VEND-CD	NR	1	1	0.3390	0.3390	Cold Drink Machine	No Retrofit		120	FALSE	1	8,760	-	-	-	2,881	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	181	1	Maintenance Shop	VEND-SN	NR	1	1	0.0410	0.0410	Snack Machine	No Retrofit		120	FALSE	1	8,760	-	-	-	348	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	182	1	Garage Maint	1424T8	2424TGR	6	6	0.0580	0.0490	1x4, 2-Lamp T8	New 2x4 w/ Elect. NP Bal. & (2) 4' T8's, Refl	50	120	TRUE	7	720	-	-	0.05	243	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	183	1	Stage	I52	NR	8	8	0.0520	0.0520	Inc 52w	No Retrofit		120	FALSE	7	720	-	-	-	291	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	184	1	Stage	I75	CF23	2	2	0.0750	0.0230	Inc 75w	Compact One Piece 23w	17	120	TRUE	7	720	-	-	0.10	105	-	-	-	$ -

Robbinsville School District NJ	Sharon Elementary-New Fixture	185	1	Stage	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	186	Ext	Main Entry	M50	NR	3	3	0.0620	0.0620	MH 50w	No Retrofit		120	FALSE	7	720	-	-	-	130	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	187	Ext	Front Wall	LPS55	NR	7	7	0.0800	0.0800	LPS55w	No Retrofit		120	FALSE	10	1,260	-	-	-	684	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	188	Ext	Kinder F Walls	LPS35	NR	5	5	0.0600	0.0600	LPS35w	No Retrofit		120	FALSE	10	1,260	-	-	-	367	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	189	Ext	Rear Wall	LPS55	NR	5	5	0.0800	0.0800	LPS55w	No Retrofit		120	FALSE	10	1,260	-	-	-	489	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	190	Ext	Receiving Wll	M150	NR	3	3	0.1700	0.1700	MH 150w	No Retrofit		120	FALSE	10	1,260	-	-	-	623	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	191	Ext	Rear Doors	CFL23	NR	2	2	0.0230	0.0230	CFL 23w	No Retrofit		120	FALSE	10	1,260	-	-	-	56	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	192	Ext	Side Wall By New	LPS55	NR	1	1	0.0800	0.0800	LPS55w	No Retrofit		120	FALSE	10	1,260	-	-	-	98	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	193	Ext	New Walls	M70	NR	6	6	0.0950	0.0950	MH 70w	No Retrofit		120	FALSE	10	1,260	-	-	-	697	-	-	-	$ -
Robbinsville School District NJ	Sharon Elementary-New Fixture	194	Ext	Single Pole Parking	M175	NR	9	9	0.2100	0.2100	MH 175w	No Retrofit		120	FALSE	31	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	195	Ext	Double Pole Parking	M2X175	NR	2	2	0.4200	0.4200	(2) MH 175w	No Retrofit		120	FALSE	31	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Sharon Elementary-New Fixture	196	Ext	Triple Pole Parking	M3X175	NR	3	3	0.6300	0.6300	(3) MH 175w	No Retrofit		120	FALSE	31	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	1	2	Office Nurse	1424	LP24	1	1	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	3	2,520	-	-	0.03	176	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	2	2	Cafeteria	1424	LP24	12	12	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	12	#N/A	#N/A	#N/A	0.34	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	3	2	Closet Cafeteria	I150	CF42	1	1	0.1500	0.0420	Inc 150w	Compact One Piece 42w	14	120	TRUE	7	720	-	-	0.10	105	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	4	2	Cafeteria	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	5	2	Classroom Floor 2	1424	LP24	12	12	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	25	#N/A	#N/A	#N/A	0.34	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	6	2	Closet Classroom Floor 2	I150	CF42	1	1	0.1500	0.0420	Inc 150w	Compact One Piece 42w	14	120	TRUE	7	720	-	-	0.10	105	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	7	2	Classroom Floor 2	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	8	2	Bathromom Floor 2	CFL23	NR	1	1	0.0230	0.0230	CFL 23w	No Retrofit		120	FALSE	15	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	9	2	Storage Books	CFL13	NR	1	1	0.0130	0.0130	CFL 13w	No Retrofit		120	FALSE	7	720	-	-	-	9	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	10	2	Storage Misc	I150	CF42	1	1	0.1500	0.0420	Inc 150w	Compact One Piece 42w		120	TRUE	7	720	-	-	0.10	105	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	11	2	Hallway Floor 2	1444	1424SW	1	1	0.1440	0.0490	1x4, 4-Lamp	New 1x4 w/ Elect. NP Bal. & (2) 4' T8's		120	TRUE	12	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	12	2	Stairs	CFL23	NR	4	4	0.0230	0.0230	CFL 23w	No Retrofit		120	FALSE	12	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	13	2	Stairs	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	14	1	Bathroom Girls Floor 1	1444	1424SW	1	1	0.1440	0.0490	1x4, 4-Lamp	New 1x4 w/ Elect. NP Bal. & (2) 4' T8's		120	TRUE	15	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	15	1	Classroom A Floor 1	1424	LP24	12	12	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	25	#N/A	#N/A	#N/A	0.34	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	16	1	Classroom A Floor 1 Coats	1424	LP24	1	1	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	25	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	17	1	Classroom A Floor 1 Closet	I150	CF42	1	1	0.1500	0.0420	Inc 150w	Compact One Piece 42w		120	TRUE	7	720	-	-	0.10	105	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	18	1	Classroom B Floor 1	1424	LP24	12	12	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	15	#N/A	#N/A	#N/A	0.34	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	19	1	Classroom B Floor 1 Coats	1424	LP24	1	1	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's	30	120	TRUE	25	#N/A	#N/A	#N/A	0.03	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	20	1	Bathroom Boys Floor 1	1444	1424SW	1	1	0.1440	0.0490	1x4, 4-Lamp	New 1x4 w/ Elect. NP Bal. & (2) 4' T8's		120	TRUE	15	#N/A	#N/A	#N/A	0.09	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	21	1	Storage Closet 1 Floor 1	I100	CF23	1	1	0.1000	0.0230	Inc 100w	Compact One Piece 23w		120	TRUE	7	720	-	-	0.07	70	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	22	1	Storage Closet 2 Floor 1	I100	CF23	1	1	0.1000	0.0230	Inc 100w	Compact One Piece 23w		120	TRUE	7	720	-	-	0.07	70	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	23	1	Hallway Floor 1	1444T8	LP44	2	2	0.1120	0.0860	1x4, 4-Lamp T8	Elect. LP Bal. & (4) 4' T8's	55	120	TRUE	12	#N/A	#N/A	#N/A	0.05	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	24	1	Hallway Floor 1	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	68	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	25	1	Stairs Down Left	CFL23	NR	1	1	0.0230	0.0230	CFL 23w	No Retrofit		120	FALSE	12	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	26	1	Stairs Down Left	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	27	1	Stairs Down Left	CFL23	NR	1	1	0.0230	0.0230	CFL 23w	No Retrofit		120	FALSE	12	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	28	1	Stairs Down Right	CFL23	NR	1	1	0.0230	0.0230	CFL 23w	No Retrofit		120	FALSE	12	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	29	1	Stairs Down Right	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	30	1	Stairs Down Right	CFL13	NR	1	1	0.0130	0.0130	CFL 13w	No Retrofit		120	FALSE	12	#N/A	#N/A	#N/A	-	#N/A	#N/A	#N/A	#N/A	#N/A
Robbinsville School District NJ	Windsor Elementary School	31	B	Closet Cleaning	I100	CF23	1	1	0.1000	0.0230	Inc 100w	Compact One Piece 23w		120	TRUE	7	720	-	-	0.07	70	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	32	B	Storage Room	1424	LP24	4	4	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's		120	TRUE	7	720	-	-	0.11	201	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	33	B	Storage Room	1222	LP22	1	1	0.0500	0.0280	1x2, 2-Lamp	Elect. LP Bal. & (2) 2' T8's		120	TRUE	7	720	-	-	0.02	35	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	34	B	Storage Room Open Area	1424	LP24	3	3	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's		120	TRUE	8	2,520	-	-	0.08	528	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	35	B	Storage Room Open Area	1222	LP22	1	1	0.0500	0.0280	1x2, 2-Lamp	Elect. LP Bal. & (2) 2' T8's		120	TRUE	8	2,520	-	-	0.02	122	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	36	B	Storage Room Open Area	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	37	B	Boiler Rom / Tanks	1424	LP24	2	2	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's		120	TRUE	3	2,520	-	-	0.06	352	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	38	B	Boiler Rom / Tanks	I100	DIS	1	1	0.1000	-	Inc 100w	Disconnect and Remove		120	TRUE	3	2,520	-	-	0.10	244	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	39	B	Boiler Rom / Tanks Closet	I100	NR	1	1	0.1000	0.1000	Inc 100w	No Retrofit		120	FALSE	7	720	-	-	-	70	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	40	B	Copy Work Room	1424	LP24	9	9	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's		120	TRUE	8	2,520	-	-	0.25	1,584	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	41	B	Copy Work Room	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	-	-	-	34	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	42	B	Closet Copy Work Room	I150	CF42	1	1	0.1500	0.0420	Inc 150w	Compact One Piece 42w		120	TRUE	7	720	-	-	0.10	105	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	43	B	Work Room 1	1424	LP24	2	2	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's		120	TRUE	8	2,520	-	-	0.06	352	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	44	B	Work Room 2	1424	LP24	3	3	0.0720	0.0430	1x4, 2-Lamp	Elect. LP Bal. & (2) 4' T8's		120	TRUE	8	2,520	-	-	0.08	528	-	-	-	$ -
Robbinsville School District NJ	Windsor Elementary School	45	Ext	All Exterior	LED20	NR	3	3	0.0200	0.0200	LED 20w	No Retrofit		120	FALSE	10	1,260	-	-	-	73	-	-	-	$ -
						Total Qty	**5,443**	**5,443**												**131**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**

Exhibit D5-1B.1
Robbinsville School District
ECM 1B Destratification Fans
Lighting and Controls

ECM Description:
Destratification Fans
Summary of Annual Energy Savings
kWh (3,816)
Therms 15,796
Assumptions, Clarifications, Deletions
Assume 85 Deg F Room perating temperature at ceiling
Calculation Formulas
Energy Savings = Sum of Wall Heat Loss + Window Heat Loss + Roof Heat Loss - Electrical Usage From Fan Motor
Measurement & Verification:
OPTION A Stipulated Savings - Electrical
OPTION C - Utility Bill Analysis. - Mechanical
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

	Savings Summary	Robbinsville HS	Pond MS	Sharon ES		Total	
C1	Cost of Fuel	$0.9130	$1.1213	$0.9591			
C2	Cost of Electricity	$0.1436	$0.1481	$0.1468			
C3	North Wall	400	130	110			
C4	South Wall	400	130	110			
C5	East Wall	285	110	214			
C6	West Wall	285	110	214			
C7	Wall Height Above Fan	4	4	3			
C8	Window Area	264	-	-			
C9	Wall Exposed Area	5,216	1,920	1,944			**(C3+C4+C5+C6)*C7-C8**
C10	Roof Area	114,000	14,300	23,540			
C11	**Fan Model**	25	45	25			
C12	Input watts	35	45	35			**IF(C11=45,45,(IF(C11=60,142,100)))**
C13	run hrs per day	12	12	12			
C14	run hrs per week	72	72	72			
C15	Weeks Per Year	26	26	26			
C16	Total run hours	1,872	1,872	1,872			**C14*C15**
C17	kwh consumed by fan	66	84.24	65.52			**(C16*C12)/1000**
C18	Total Roof Square Footage	114,000	14,300	23,540			
C19	SF per Fan	3,500	1,200	2,100			
C20	Total Fans	33	12	11		**56**	**ROUND(C18/C19,0)**
C21	Total Kwh Consumed	2,162	1,011	721			**C20*C17**
C22	Room design Occupied	85	85	85			
C23	Room Design Unoccupied	70	70	70			
C24	Calculated Fuel Savings Therms	12,234	1,665	2,555		**16,454**	**B20**
C25	Calculated Fuel Savings $$	$11,169	$1,867	$2,450		**$15,487**	**C24*C1**
C26	Additional Electric Usage	(2,162)	(1,011)	(721)		**(3,894)**	**(C21)**
C27	Additional Electric Usage $$	($310)	($150)	($106)		**($566)**	**C26*C2**
C28	De-Rate Fuel	4%	4%	4%			
C29	De-Rate Electric	2%	2%	2%			
C30	Calculated Fuel Savings	11,745	1,599	2,453		**15,796**	**C24*(1-C28)**
C31	Calculated Fuel Savings $$	$10,723	$1,793	$2,352		**$14,867**	**C30*C1**
C32	Additional Electric usage	(2,119)	(991)	(706)		**(3,816)**	**C26*(1-C29)**
C33	Additional Electric Usage $$	($304)	($147)	($104)		**($555)**	**C32*C2**

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	(3,816)	kwh/yr	0.000592	Tons/kwh	-2.3	Tons CO2/yr	(0.4)	-0.2
Natural Gas	1,580	mmbtu/yr	0.058500	Tons/mmBtu	92.4	Tons CO2/yr	16.1	9.7
#2 Fuel Oil		gal/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**90.1**		**15.7**	**9.5**

Exhibit D5-1B.2
Robbinsville School District
ECM 1B Destratification Fans
Lighting

ASHRAE TMY-2 Weather Data

Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	M.C. Enthalpy Btu/lbma	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall area	Exposed Roof area	Window area	Wall U factor	Roof U factor	Window U factor	Wall Heat loss	Roof Heat Loss	Windows Heat Loss	Total Heat loss
Robbinsville HS										sq.ft	sq.ft	sq.ft	tu/sq.ft/deg	btu/sq.ft/degF	btu/sq.ft/degF	Btu/year	Btu/year	Btu/year	Btu/year
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**
Heating										**C9**	**C10**					**B14*B11*(C22-B2)*B9+B14*B11*(C23-B2)*B10**	**B15*B12*(C22-B2)*B9+B15*B12*(C23-B2)*B10**	**B16*B13*(C22-B2)*B9+B16*B13*(C23-B2)*B10**	**B17+B18+B19**
55 to 60	57.5	50	20	217	191	192	600	365	235	5,216	114,000	264	0.08	0.05	1	5,415,773	73,978,875	3,426,390	82,821,038
50 to 55	52.5	46	18	218	223	289	730	458	272	5,216	114,000	264	0.08	0.05	1	8,198,248	111,987,188	5,186,775	125,372,211
45 to 50	47.5	42	16	243	196	195	634	379	255	5,216	114,000	264	0.08	0.05	1	8,322,389	113,682,938	5,265,315	127,270,641
40 to 45	42.5	38	14	193	171	149	513	312	201	5,216	114,000	264	0.08	0.05	1	7,841,995	107,120,813	4,961,385	119,924,193
35 to 40	37.5	34	13	357	311	355	1,023	622	401	5,216	114,000	264	0.08	0.05	1	17,767,522	242,702,438	11,240,955	271,710,914
30 to 35	32.5	29	11	277	221	236	734	438	296	5,216	114,000	264	0.08	0.05	1	14,225,597	194,320,125	9,000,090	217,545,812
25 to 30	27.5	25	9	159	98	134	391	222	170	5,216	114,000	264	0.08	0.05	1	8,320,563	113,658,000	5,264,160	127,242,723
20 to 25	22.5	19	7	89	48	58	195	107	89	5,216	114,000	264	0.08	0.05	1	4,531,661	61,902,000	2,867,040	69,300,701
15 to 20	17.5	15	6	74	20	31	125	58	67	5,216	114,000	264	0.08	0.05	1	3,100,651	42,354,563	1,961,685	47,416,899
10 to 15	12.5	10	4	35	7	5	47	19	28	5,216	114,000	264	0.08	0.05	1	1,245,842	17,018,063	788,205	19,052,109
5 to 10	7.5	4	2	17	9	8	34	18	16	5,216	114,000	264	0.08	0.05	1	1,000,950	13,672,875	633,270	15,307,095
0 to 5	2.5	1	1	1	0	0	1	0	1	5,216	114,000	264	0.08	0.05	1	29,731	406,125	18,810	454,666
-5 to 0	-2.5	-	-	-	0	0	-	-	-	5,216	114,000	264	0.08	0.05	1	-	-	-	-
-10 to -5	-7.5	-	-	-	0	0	-	-	-	5,216	114,000	264	0.08	0.05	1	-	-	-	-
								-											
Total				1,880	1,495	1,652	5,027	2,998	2,030							80,000,922	1,092,804,000	50,614,080	1,223,419,002
																Total Heat Saved	**Therms**	**12,234**	

ASHRAE TMY-2 Weather Data

Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	M.C. Enthalpy Btu/lbma	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall area	Exposed Roof area	Window area	Wall U factor	Roof U factor	Window U factor	Wall Heat loss	Roof Heat Loss	Windows Heat Loss	Total Heat loss
Pond MS										sq.ft	sq.ft	sq.ft	btu/sq.ft/degF	btu/sq.ft/degF	btu/sq.ft/degF	Btu/year	Btu/year	Btu/year	Btu/year
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**
Heating																**B14*B11*(C22-B2)*B9+B14*B11*(C23-B2)*B10**	**B15*B12*(C22-B2)*B9+B15*B12*(C23-B2)*B10**	**B16*B13*(C22-B2)*B9+B16*B13*(C23-B2)*B10**	**B17+B18+B19**
55 to 60	57.5	50	20	217	191	192	600	365	235	**1,920**	**14,300**	0	0.08	0.05	1	1,993,536	9,279,806	-	11,273,342
50 to 55	52.5	46	18	218	223	289	730	458	272	1,920	14,300	0	0.08	0.05	1	3,017,760	14,047,516	-	17,065,276
45 to 50	47.5	42	16	243	196	195	634	379	255	1,920	14,300	0	0.08	0.05	1	3,063,456	14,260,228	-	17,323,684
40 to 45	42.5	38	14	193	171	149	513	312	201	1,920	14,300	0	0.08	0.05	1	2,886,624	13,437,084	-	16,323,708
35 to 40	37.5	34	13	357	311	355	1,023	622	401	1,920	14,300	0	0.08	0.05	1	6,540,192	30,444,253	-	36,984,445
30 to 35	32.5	29	11	277	221	236	734	438	296	1,920	14,300	0	0.08	0.05	1	5,236,416	24,375,244	-	29,611,660
25 to 30	27.5	25	9	159	98	134	391	222	170	1,920	14,300	0	0.08	0.05	1	3,062,784	14,257,100	-	17,319,884
20 to 25	22.5	19	7	89	48	58	195	107	89	1,920	14,300	0	0.08	0.05	1	1,668,096	7,764,900	-	9,432,996
15 to 20	17.5	15	6	74	20	31	125	58	67	1,920	14,300	0	0.08	0.05	1	1,141,344	5,312,897	-	6,454,241
10 to 15	12.5	10	4	35	7	5	47	19	28	1,920	14,300	0	0.08	0.05	1	458,592	2,134,722	-	2,593,314
5 to 10	7.5	4	2	17	9	8	34	18	16	1,920	14,300	0	0.08	0.05	1	368,448	1,715,106	-	2,083,554
0 to 5	2.5	1	1	1	0	0	1	0	1	1,920	14,300	0	0.08	0.05	1	10,944	50,944	-	61,888
-5 to 0	-2.5	-	-	-	0	0	-	-	-	1,920	14,300	0	0.08	0.05	1	-	-	-	-
-10 to -5	-7.5	-	-	-	0	0	-	-	-	1,920	14,300	0	0.08	0.05	1	-	-	-	-
Total				1,880	1,495	1,652	5,027	2,998	2,030							29,448,192	137,079,800	-	166,527,992
																Total Heat Saved	**Therms**	**1,665**	

ASHRAE TMY-2 Weather Data

Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	M.C. Enthalpy Btu/lbma	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall area	Exposed Roof area	Window area	Wall U factor	Roof U factor	Window U factor	Wall Heat loss	Roof Heat Loss	Windows Heat Loss	Total Heat loss
Sharon ES										sq.ft	sq.ft	sq.ft	btu/sq.ft/degF	btu/sq.ft/degF	btu/sq.ft/degF	Btu/year	Btu/year	Btu/year	Btu/year
B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**
Heating																**B14*B11*(C22-B2)*B9+B14*B11*(C23-B2)*B10**	**B15*B12*(C22-B2)*B9+B15*B12*(C23-B2)*B10**	**B16*B13*(C22-B2)*B9+B16*B13*(C23-B2)*B10**	**B17+B18+B19**
55 to 60	57.5	50	20	217	191	192	600	365	235	**1944**	**23,540**	0	0.08	0.05	1	2,018,455	15,275,989	-	17,294,444
50 to 55	52.5	46	18	218	223	289	730	458	272	1,944	23,540	0	0.08	0.05	1	3,055,482	23,124,372	-	26,179,854
45 to 50	47.5	42	16	243	196	195	634	379	255	1,944	23,540	0	0.08	0.05	1	3,101,749	23,474,529	-	26,576,279
40 to 45	42.5	38	14	193	171	149	513	312	201	1,944	23,540	0	0.08	0.05	1	2,922,707	22,119,508	-	25,042,215
35 to 40	37.5	34	13	357	311	355	1,023	622	401	1,944	23,540	0	0.08	0.05	1	6,621,944	50,115,924	-	56,737,869
30 to 35	32.5	29	11	277	221	236	734	438	296	1,944	23,540	0	0.08	0.05	1	5,301,871	40,125,401	-	45,427,272
25 to 30	27.5	25	9	159	98	134	391	222	170	1,944	23,540	0	0.08	0.05	1	3,101,069	23,469,380	-	26,570,449
20 to 25	22.5	19	7	89	48	58	195	107	89	1,944	23,540	0	0.08	0.05	1	1,688,947	12,782,220	-	14,471,167
15 to 20	17.5	15	6	74	20	31	125	58	67	1,944	23,540	0	0.08	0.05	1	1,155,611	8,745,846	-	9,901,456
10 to 15	12.5	10	4	35	7	5	47	19	28	1,944	23,540	0	0.08	0.05	1	464,324	3,514,081	-	3,978,405
5 to 10	7.5	4	2	17	9	8	34	18	16	1,944	23,540	0	0.08	0.05	1	373,054	2,823,329	-	3,196,382
0 to 5	2.5	1	1	1	0	0	1	0	1	1,944	23,540	0	0.08	0.05	1	11,081	83,861	-	94,942
-5 to 0	-2.5	-	-	-	0	0	-	-	-	1,944	23,540	0	0.08	0.05	1	-	-	-	-
-10 to -5	-7.5	-	-	-	0	0	-	-	-	1,944	23,540	0	0.08	0.05	1	-	-	-	-
Total				1,880	1,495	1,652	5,027	2,998	2,030							29,816,294	225,654,440	-	255,470,734
																Total Heat Saved	**Therms**	**2,555**	

Exhibit G5- 1C.1
Robbinsville School District
ECM - 1C Vending Miser

Lighting and Controls

ECM Description:
Vending Misers
Summary of Annual Energy Savings:
kWh 13,442
Therms
Assumptions, Clarifications, Deletions:
Controler savings based on unblended rates
Burn hours are stipulated
Calculation Formulas
kWh Saved = (Machine Watts w/o VM - Machine Watts w VM) x Hours
Measurement & Verification:
OPTION A Stipulated Savings
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

	Robbinsville HS	Pond MS	Windsor ES	Sharon ES		Totals
Energy Costs (per kwh)	$0.144	$0.148	$0.179	$0.147		
Facility Occupied Hours per Week	60	60	60	60		
Number of Cold Drink Vending Machines	5	1		1		**7**
Number of Uncooled Snack Machines	1	1				**2**
Power Req. of Cold Drink Machine (Watts)	400	400	400	400		
Power Req. of Snack Machine (Watts)	80	80	80	80		
Savings Analysis						
	Before	Before	Before	Before		
Cold Drink Machines	kWh	kWh	kWh	kWh		
	17,472	3,494	-	3,494		
	After	After	After	After		
	kWh	kWh	kWh	kWh		
	8,112	1,622	-	1,622		
	Before	Before	Before	Before		
Snack Machines	kWh	kWh	kWh	kWh		
	699	699	-	-		
	After	After	After	After		
	kWh	kWh	kWh	kWh		
	250	250	-	-		
Cost per kWh	$0.144	$0.148	$0.179	$0.147		
Project Summary						
Kwh Savings	9,809	2,321	-	1,872		**14,002**
$$ Savings	$1,408	$344	$0	$275		**$2,027**
De-Rate	4%	4%	4%	4%		
Savings Kwh	9,417	2,228	-	1,797		**13,442**
Savings $$	$1,352	$330	$0	$264		**$1,946**

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	13,442	kwh/yr	0.0005919	Tons/kwh	7.956211875	Tons CO2/yr	1.39	0.84
Natural Gas		mmbtu/yr	0.0585	Tons/mmBtu	-	Tons CO2/yr	-	-
Totals					7.96		1.39	0.84

	Robbinsville HS	Pond MS	Pond MS	Windsor ES	Sharon ES
			DHW		
Existing Boiler Efficiency	84.99%	70.00%		85.00%	65.00%
Proposed Boiler Efficiency	84.99%	94.00%		85.00%	94.00%
Existing Boilers	Absorption Chiller				
Manuf.	Broad Spectrum	Weil McLain		HB Smith	HB Smith
Model No	11-330-H4	1794		28A-5	350 Mills
Units	2	2		1	1
Input	6,471,000	5,773,000		1,192,941	2,675,385
Output	5,500,000	4,041,100		1,014,000	1,739,000
Efficiency	85%	70%		85%	65%
BHp					
Burner					
Burner Model No.					
Year Built					
S/N					
Type	330 Tons			Steam	
Fuel	NG	NG		Oil	NG
Manuf.			A.O. Smith		HB Smith
Model No			HW 399 932		350 Mills
Units			2		1
Input			399000		2,496,154
Output			322790		1,947,000
Efficiency			81%		78%
BHp					
Burner					C2-G-20BHBS-12
Burner Model No.					
Year Built			1995		
S/N			932 G95 28259		
Proposed New Boilers					
Manuf.	Fulton	Fulton	A.O. Smith		Fulton
Model No	Vantage 3000	Vantage 4000	BTH-200		
Units	2	1	2		1
Input	3,000,000	4,000,000	199,000		3,000,000
Output	2,790,000	3,760,000	189,050		2,820,000
Efficiency	0.93	0.94	0.95		0.94
BHp					
Burner					
Burner Model No.					
Bldg SF	221,457	150,000			78,800
BTU/SF	40	40			40
	8,858,280	6,000,000			3,152,000
Combustion Air (1CFM/3000 BTUH)	1,000	1,333			1,000
Combustion Air DHW(1Sq- in/4000 BTUH)			132.6666667		

Exhibit D5-2A.1
Robbinsville School District
ECM - 2A Boiler Replacements
Mechanical

ECM Description:
Boiler Replacements
Summary of Annual Energy Savings:
kWh
Therms 11,676
Assumptions, Clarifications, Deletions:
See Notes below
Windsor Burner will be converted to Dual Fuel
Windsor Saving based on fuel cost only
Calculation Formulas
((% Change in Boiler Efficiency) / (Old Overall Thermal Efficiency in % + % Change in Efficiency)) * Adjusted Boiler Fuel Use
Measurement & Verification:
OPTION C - Utility Bill Analysis.
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

		Pond MS	Windsor ES	Sharon ES	Total			
C1	No. of Units	2	1	2	**5**			
C2	Current Boiler Efficiency	70%	85%	65%		%		Overall Thermal Efficiency
C3	Proposed Boiler Effiiciency	94%	85%	94%		%		Overall Thermal Efficiency
C4	Improvement in Boiler Efficiency	24%	0%	29%		%	C3-C2	New Boiler Efficiency
C5	Annual Boiler Fuel Use	46,639	3,615	23,842		Therms/Yr		
C6	Adjusted Boiler Usage	27,936	1,994	16,304		Therms/Yr	C5	Baseline therms less savings from other ECMs
C7	Boiler Fuel Cost	$1.121	$2.260	$0.959		$/Therm		
C8	Annual Energy Savings	7,133	-	5,030	**12,162**	Therms/Yr	(C4/(C2+C4)*C6)	((% Change in Boiler Efficiency) / (Old Overall Thermal Efficiency in % + % Change in Efficiency)) * Adjusted Boiler Fuel Use
C9	Annual Energy Savings $$	$7,998	$2,238	$4,824	**$15,060**		C8*C7	
C10	De-Rate	4%	4%	4%				
C11	Annual Energy Savings	6,847	-	4,829	**11,676**	Therms/Yr	C8*(1-C10)	
C12	Annual Energy Savings $$	$7,678	$2,149	$4,631	**$14,458**		C9*(1-C10)	

Notes:
Replacing the existing boiler with a new, high efficiency unit will reduce operating costs at this location.
Improving the air/fuel ratio will increase overall boiler combustion efficiency.
New Boiler will be Natural Gas
Note that the boiler efficiency discussed here is the overall boiler thermal efficiency, not just its combustion efficiency. The value of this number will be much lower than for combustion efficiency alone as it includes losses from radiation, blowdown, and other related losses. The value for annual boiler fuel has been adjusted for the effect of other ECMs.

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units			Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity		kwh/yr			0.0005919	Tons/kwh	-	Tons CO2/yr	-	-
Natural Gas	1,168	mmbtu/yr			0.0585000	Tons/mmBtu	68.30	Tons CO2/yr	11.93	7.19
#2 Fuel Oil		mmbtu/yr			0.0111900	Tons/gal	-	Tons CO2/yr	-	-
Totals							68.30		11.93	7.19

Exhibit D5-2B.1
Robbinsville School District
ECM - 2B   Domestic Hotwater DHW Boiler Replacements
Mechanical

ECM Description:

DHW Boiler Replacements

Summary of Annual Energy Savings:
kWh
Therms 955
Assumptions, Clarifications, Deletions:
See Notes below
Calculation Formulas
((% Change in Boiler Efficiency) / (Old Overall Thermal Efficiency in % + % Change in Efficiency)) * Adjusted Boiler Fuel Use
Measurement & Verification:
OPTION C - Utility Bill Analysis.
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

		Pond MS	Sharon ES		Total			
C1	No. of Units	2	1		**3**			
C2	Current Boiler Efficiency	70%	65%			%		Overall Thermal Efficiency
C3	Proposed Boiler Effiiciency	94%	94%			%		Overall Thermal Efficiency
C4	Improvement in Boiler Efficiency	24%	29%			%	C3-C2	New Boiler Efficiency
C5	Annual Fuel Use	46,639	22,650			Therms/Yr		
C6	Adjusted Boiler Usage	2,455	1,192			Therms/Yr	C5	Baseline therms less savings from other ECMs
C7	Boiler Fuel Cost	$1.121	$0.959			$/Therm		
C8	Annual Energy Savings	627	368		**995**	Therms/Yr	(C4/(C2+C4)*C6)	((% Change in Boiler Efficiency) / (Old Overall Thermal Efficiency in % + % Change in Efficiency)) * Adjusted Boiler Fuel Use
C9	Annual Energy Savings $$	$703	$353		**$1,055**		C8*C7	
C10	De-Rate	4%	4%					
C11	Annual Energy Savings	602	353		**955**	Therms/Yr	C8*(1-C10)	
C12	Annual Energy Savings $$	$675	$339		**$1,013**		C9*(1-C10)	

Notes:
Replacing the existing boiler with a new, high efficiency unit will reduce operating costs at this location.
Improving the air/fuel ratio will increase overall boiler combustion efficiency.
New Boiler will be Natural Gas
Note that the boiler efficiency discussed here is the overall boiler thermal efficiency, not just its combustion efficiency. The value of this number will be much lower than for combustion efficiency alone as it includes losses from radiation, blowdown, and other related losses. The value for annual boiler fuel has been adjusted for the effect of other ECMs.

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units			Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity		kwh/yr			0.0005919	Tons/kwh	-	Tons CO2/yr	-	-
Natural Gas	95	mmbtu/yr			0.0585000	Tons/mmBtu	5.59	Tons CO2/yr	0.98	0.59
#2 Fuel Oil		mmbtu/yr			0.0111900	Tons/gal	-	Tons CO2/yr	-	-
Totals							5.59		0.98	0.59

Exhibit D5 - 2C.1
Robbinsville School District
ECM-2C Boiler Burner Controls
Mechanical

ECM Description:
Boiler Burner Controls
Summary of Annual Energy Savings:
kWh
Therms 1,713
Assumptions, Clarifications, Deletions:
See Notes below
Calculation Formulas
((% Change in Boiler Efficiency) / (Old Overall Thermal Efficiency in % + % Change in Efficiency)) * Adjusted Boiler Fuel Use
Measurement & Verification:
OPTION C - Utility Bill Analysis.
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

	Savings Calculation	**Pond MS**			
C1	Number of Units	2		2	
C2	Current Boiler Efficiency	70%			Overall Thermal Efficiency
C3	**Projected Burner/Boiler Efficiency Savings**				
C4	Removal of Linkage Wear	1.50%			
C5	Improved Combustion	2.00%			
C6	Increased Turndown	1.50%			
C7	Total Efficiency Savings	5.00%			
C8	Annual Boiler Fuel Use	46,639			From Savings interact Summary Therms/Yr
C9	Adjusted Boiler Usage	27,936			Interactive Summary (Therms)
C10	Boiler Fuel Cost	$1.12			$/Therm
C11	Annual Energy Savings	1,862		**1,862**	((% Change in Boiler Efficiency) / (Old Overall Thermal Efficiency in % + % Change in Efficiency)) * Adjusted Boiler Fuel Use (C7/(C2+C7)*C9)
C12	Annual Energy Savings	$2,088		**$2,088**	C11*C10
C13	De-Rate	8%			
C14	Annual Energy Savings	1,713		**1,713**	C11*(1-C$13)
C15	Annual Energy Savings	$1,921		**$1,921**	C12*(1-C$13)

Notes:
Upgrade of boiler controls will improve boiler efficiency by improving the air/fuel ratio over the entire firing range of the boiler.
Improving the air/fuel ratio will increase overall boiler combustion efficiency.
To achieve these savings, a new control system will be added to each boiler - the Control Links system.
Experience and testing of this equipment indicates that this system will improve overall boiler efficiency by 2% to 8%.
Note that the boiler efficiency discussed here is the overall boiler thermal efficiency, not just its combustion efficiency. The value of this number will be much lower than for combustion efficiency alone as it includes losses from radiation, blowdown, and other related losses. The value for annual boiler fuel has been adjusted for the effect of other ECMs.

Greenhouse Gas Emissions (GHGs)

Fuel	**Savings**	**Units**	**Carbon Emission Factor**	**Units**	**Emissions**		**Equivalent Cars/yr**	**Equivalent Forested Acres/yr**
Electricity		kwh/yr	0.0005919	Tons/kwh	0	Tons CO2/yr	0	0
Natural Gas	171	mmbtu/yr	0.0585	Tons/mmBtu	10.0	Tons CO2/yr	1.8	1.1
#2 Fuel Oil		mmbtu/yr	0.01119	Tons/gal	0.0	Tons CO2/yr	0.0	0.0
Totals					**10.0**		**1.8**	**1.1**

Exhibit D5-2D.1
Robbinsville School District
ECM 2D Kitchen Hood Controllers
Mechanical

ECM Description:

Kitchen Hood Controllers

Summary of Annual Energy Savings:

kWh 2,390
Therms 1,166

Assumptions, Clarifications, Deletions:

Assumptions Heating Temp = 70F, Cooling Temp 72F, Hours of Operation 8AM - 2PM

Calculation Formulas

Energy Savings (kWh)= (Previous Net Cooling Load - New Net Cooling Load) x 0.6 x AC Correction Factor / (3.412 x COP)
Energy Savings (Therms) = (Previous Net Heating Load - New Net Heating Load) x 0.6 / System Efficiency

Measurement & Verification:

OPTION A Stipulated Savings - Electrical
OPTION C - Utility Bill Analysis. - Mechanical

Commissioning:

Third Party commissioning as per NJ ESIP

Data and Calculations:

		Robbinsville HS	Pond MS		Totals		
	# of Units	**2**	**1**		**3**		
C1	Hood Area	130	80				
C2	Exhaust Flow	9750	6000				Q = 75 x Area
C3	Operating Hours perday	6	6				
C4	Operating Days per week	5	5				
C5	Operating Weeks per Year	30	30			Hrs	C3 * C4
C6	Hp of Fan Motor	4	7.5				
C7	Load Factor of Fan	0.4	0.4				
C8	Cost per Killowatt Hour	0.1213	0.1213				
C9	Cost per Therm	1.00000	1.00000				
C10	**Motor Operating Savings**						
C11	Operating Hours perday	6	6			hrs/day	
C12	Operating Days per week	5	5			days/wk	
C13	Operating Weeks per Year	30	30			Wks/ yr	
C14	Hp of Fan Motor	4	7.5			HP	
C15	Load Factor of Fan	0.4	0.4				
C16	Cost per Killowatt Hour	0.121	0.121			$/Kwhr	
C17	Total Time	900	900			Hrs/Yr	C11*C12*C13
C18	Total KWhr per Hp per year	746	746			Kwh/Hp/yr	0.746/0.9*C17
C19	**Variable Exhaust Volume Analysis**						
C20	Total Kwh per Hp per year	396.6	396.6			Kwh/Hp/Yr	Sum of Column N
C21	Kwh Savings per year	559	1048			Kwh/yr	(C18-C20)*C14*C15
C22	**Heating Savings**						
C23	**Conditioned Make-up Air Heatng**						
C24	Previous Net Exhaust Volume	9,750	6,000			cfm	
C25	New Net Exhaust Volume	7,150	4,400			cfm	Table 1
C26	Winter building Temperature	70	70			F	
C27	Previous net heat Load	**388,123**	**238,280**			kBTU	outdoor air load calculator
C28	New Net heat Load	**284,215**	**174,337**			kBTU	outdoor air load calculator
C29	Operating Hours per Day	6	6			Hrs/Day	
C30	Operating Days per Week	5	5			Days/Week	
C31	Btu per Fuel Unit	1000	1000			kBtu/unit	
C32	System Efficiency	84%	82%				
C33	Total KBtU	74,664	46,845			kBtu	(C27-C28)*0.6/C32
C34	Total Therms	747	468			Therms	C33*1000/100000
C36	**Cooling Savings**						
C37	Previous Net Exhaust Volume	9,750	6,000			cfm	
C38	New Net Exhaust Volume	7,150	4,400			cfm	c37*Table 1
C39	Previous net cooling Load	**49,890**	**30,701**			kBTU	outdoor air load calculator
C40	New Net cool Load	**36,584**	**22,513**			kBTU	outdoor air load calculator
C41	AC Correction Factor	0.55	0.55				
C42	COP	2.5	2.5				
C43	Savings	515	317			kWh	(C39 -C40) x 0.6 x C41 / (3.413 x C42)
C44	**Savings Therms**	747	468		**1,215**		
C45	**Savings Therms $$**	$747	$468		**$1,215**		
C46	**Savings Electric**	1,074	1,365		**2,439**		
C47	**Savings Electric $$**	$130	$166		**$296**		
C48	**De-Rate Therms**	4%	4%				
C49	**De-Rate Electric**	2%	2%				
C50	**Savings Therms**	717	450		**1,166**		
C51	**Savings Therms $$**	$717	$450		**$1,166**		
C52	**Savings Electric**	1,052	1,338		**2,390**		
C53	**Savings Electric $$**	$128	$162		**$290**		

Greenhouse Gas Emissions (GHGs)

Fuel	Savings		Units		Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	2389.8		kwh/yr		0.000592	Tons/kwh	1.4	Tons CO2/yr	0.2	0.1
Natural Gas	116.6		mmbtu/yr		0.058500	Tons/mmBtu	6.8	Tons CO2/yr	1.2	0.7
#2 Fuel Oil			mmbtu/yr		0.011190	Tons/gal		Tons CO2/yr		
Totals							8.2		1.4	0.9

Exhibit D5-2E.1
Robbinsville School District
ECM Walkin Refrigeration Controls
Mechanical

ECM Description:
Walkin Refrigeration Controls

Summary of Annual Energy Savings:
kWh 7,083
Therms

Assumptions, Clarifications, Deletions:
Assume Existing Cooling Usage is 2% of Overall Building Usage
Assume Controller will save 3% of Current refrigeration Usage
Savings based on device analyzing the demands and thermal characteristics of the entire refrigeration system, and dynamically modifies the compressor cycle pattern.

Calculation Formulas
Energy Savings (kWh)= Existing Cooling Usage x Controller Savings %

Measurement & Verification:
OPTION A Stipulated Savings - Electrical

Commissioning:
Third Party commissioning as per NJ ESIP

Data and Calculations:

		Robbinsville HS	Pond MS		Total		
C1	Exisitng Builidng kWh	2,578,800	1,505,300				
C2	Existing Cooling Usage	2%	2%				Assume @ 2%
C3	Existing Cooling Usage	51,576	30,106			kWh	C1*C2
C4	Savings by Controller	3%	3%				Assume @ 3%
C5	Number of Controllers	2	2		6		C3*C4*C5
C6	Savings by Controller	3,095	1,806			kWh	
C7							
C8	Post Retrofit Usage	48,481	28,300			kWh	C3-C6
C9	Cost per kWh	$ 0.144	$ 0.148				
C10	$$ kWh	$ 444	$ 268		**$ 712**		C6*C9
C11	kWh	3,095	1,806		**4,901**	kWh	
C12	Derate	2%	2%				
C13	$$ kWh	$ 435	$ 262		**$ 698**		C10*(1 - C12)
C14	kWh	3,033	1,770		**4,803**	kWh	c11*(1-C12)

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	7,083	kwh/yr	0.000592	Tons/kwh	4.2	Tons CO2/yr	0.7	0.4
Natural Gas	-	mmbtu/yr	0.058500	Tons/mmBtu	0.0	Tons CO2/yr	-	0.0
Totals					**4.2**		**0.7**	**0.4**

Exhibit D5-2F.1
Robbinsville School District
ECM - 2F Solar Thermal Domestic HW
Mechanical

ECM Description:
Solar Thermal DHW
Summary of Annual Energy Savings:
kWh
Therms 1,096
Assumptions, Clarifications, Deletions:
3 gal/Day per Occupant
Solar Inensity 4.46 Btu/Square meter/day
Calculation Formulas
Btu requirement = No. of people x School days x gal/day/occupant x 8.83 x (DWH temp - City Water Temp)
Measurement & Verification:
OPTION C - Utility Bill Analysis.
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

		Robbinsville HS		Total	
C1	deg F, DHW distribution	125			
C2	deg F, city water	55			
C3	people in school (Sept - June)	928			
C4	school days/yr for school year	182			
C5	people in school (July - Aug)	464			
C6	school days/summer/year	34			
C7	gal/day/occupant	3			
C8	Btu/yr DHW req during school yr	295,804,454			C3*C4*C7*8.34*(C1-C2)
C9	Btu/yr DHW req during summer	27,630,086			C5*C6*C7*8.34*(C1-C2)
C10	Btu/yr DHW req - total for school/yr	323,434,541			C9+C8
C11	therms/yr DHW req - total	3,234			C10/1000
C12	assume contribution from solar thermal system	30%			
C13	therms/yr DHW to be produced by a solar thermal system	970			C12*C11
C14	existing efficiency of nat gas consumption	85%			
C15	$/therm, assumed paid by school for natural gas delivered	$0.91			
C16	Therms Saved	1,142		1,142	C13/C14
C17	Therms Saved $$	$1,042		$1,042	C15*C16
C18	Derate	4%			
C19	Therms Saved	1,096		1,096	C16*(1-C18)
C20	Therms Saved $$	$1,001		$1,001	C17*(1-C18)

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity		kwh/yr	0.0005919	Tons/kwh	0	Tons CO2/	0	0
Natural Gas	110	mmbtu/yr	0.0585	Tons/mmBtu	6.4	Tons CO2/	1.1	0.7
#2 Fuel Oil		mmbtu/yr	0.01119	Tons/gal	0.0	Tons CO2/	0.0	0.0
Totals					**6.4**		**1.1**	**0.7**

Exhibit D5-2F.1
Robbinsville School District
ECM - 2G **Sharon ES 150 Tons of Additional Cooling**
Mechanical

ECM Description:
Sharon ES 150 Tons of Additional Cooling
Summary of Annual Energy Savings:
kWh 89,308
Therms
Assumptions, Clarifications, Deletions:
Energy cost increase associated with increased cooling
Assume new equipment has EER =12
Calculation Formulas
Cooling Tons = (OAT - Discharge Air Temp) x 1.08 x CFM / BTU/Ton
Cooling Load = Cooling Tons x Hours x Cooling Efficiency
Measurement & Verification:
Option A Stipulated Savings

Commissioning:
Third Party commissioning as per NJ ESIP

Initial Assumptions

# of Classrooms		30	
Students per Classroom		25	
Staff per Classroom		1	
Total CFM Air Flow		45,000	cu.ft/min
Estimated % Cooling		100%	
Adjusted Unit Vent CFM		45,000	cu.ft/min
Cost of fuel		$ 0.91	per therm
Heating efficiency		85%	
Cooling efficiency		1.00	kW/ton EER = 12
BTU/ton		12,000	
Cost of electricity		$ 0.15	per kWh
Discharge air temperature from units		55	deg F

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Mid-pts	DB (F)	Total Occ. Hours	Heating Load Therms	Heating Load Cost	Cooling Load Tons	Cooling Load kWh	Cooling Load Cost	Total additional Energy Cost
97.5	95 to 100	1			172	172	$ 25	$ 25
92.5	90 to 95	18			152	2,734	$ 405	$ 405
87.5	85 to 90	34			132	4,475	$ 663	$ 663
82.5	80 to 85	162			111	18,043	$ 2,672	$ 2,672
77.5	75 to 80	287			91	26,153	$ 3,873	$ 3,873
72.5	70 to 75	297			71	21,050	$ 3,117	$ 3,117
67.5	65 to 70	330			51	16,681	$ 2,470	$ 2,470
62.5	60 to 65	412	-	$ -				$ -
57.5	55 to 60	146	-	$ -				$ -
52.5	50 to 55	119	-	$ -				$ -
47.5	45 to 50	129	-	$ -				$ -
42.5	40 to 45	189	-	$ -				$ -
37.5	35 to 40	347	-	$ -				$ -
32.5	30 to 35	333	-	$ -				$ -
27.5	25 to 30	289	-	$ -				$ -
22.5	20 to 25	177	-	$ -				$ -
17.5	15 to 20	175	-	$ -				$ -
12.5	10 to 15	68	-	$ -				$ -
7.5	5 to 10	38	-	$ -				$ -
2.5	0 to 5	16	-	$ -				$ -
-2.5	-5 to 0	5	-	$ -				$ -
-7.5	-10 to -5	0	-	$ -				$ -
		3,570	-	$ -	780	(89,308)	$ (13,225)	$ (13,225)

Based on adding 150 Tons Cooling

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	(89,308)	kwh/yr	0.0005919	Tons/kwh	-52.86114624	Tons CO2/yr	-9.23338799	-5.564331184
Natural Gas		mmbtu/yr	0.0585	Tons/mmBtu	0.0	Tons CO2/yr	0.0	0.0
#2 Fuel Oil		mmbtu/yr	0.01119	Tons/gal	0.0	Tons CO2/yr	0.0	0.0
Totals					**-52.9**		**-9.2**	**-5.6**

Exhibit D5-3A.1

Robbinsville School District

ECM 3A Building Management System Upgrades

Building Management Systems

ECM Description:

Building Management System Upgrades

Summary of Annual Energy Savings:

kWh	161,457
Therms	13,736

Assumptions, Clarifications, Deletions:

Proposed Temperatures Occupied 72 F Heating

Proposed Temperatures Unoccupied 58 F Heating

Proposed Temperatures Occupied 74 F Cooling

Proposed Temperatures Unoccupied 85 F Cooling

Calculation Formulas

Savings Heating-= (Existing Heating Degree Hours - Proposed Heating Degree Hours) x Adjusted Boiler Load

Savings Cooling-= (Existing Cooling Degree Hours - Proposed Cooling Degree Hours) x Cooling Load

Measurement & Verification:

OPTION A Stipulated Savings - Electric

OPTION C - Utility Bill Analysis. - Thermal

Commissioning:

Third Party commissioning as per NJ ESIP

Data and Calculations:

Thermal Savings

	Current	Proposed
Occupied Space Temperature	72.0	72.0
Unoccup. Space Temperature	68.0	58.0

NIGHT SETBACK & CW VFD SAVINGS CALCULATIONS:

Description	Current Boiler Usage	Adjusted Baseline (includes interactive ECM affects)	Adjusted Boiler Load for Space Heating	Existing heating deg-hrs	Proposed heating deg-hrs	Energy Savings	Energy Savings	Energy Rate	Energy Savings	De-Rate	Energy Savings	Energy Savings	Energy Savings	Energy Rate	Energy Savings	De-Rate	Energy Savings	Energy Savings
	Therms/yr	Therms/yr	Therms/yr	F	F	%	Therms/yr	$/Therm	$		Therms/yr	$	kWh/yr	$/kWh	$	0.0	kWh/yr	$
Robbinsville HS	136,120.8	117,014.3	117,014.3	92,933.4	79,889.8	7%	8,211.8	$0.91	$7,497	4%	7,883.3	$7,197	95,389.3	$0.1436	$9,089	2%	93,481.5	$8,907
Pond MS	46,639.3	27,935.7	27,935.7	92,933.4	79,889.8	13%	3,528.8	$1.12	$3,957	4%	3,387.7	$3,799	65,895.6	$0.1481	$9,758	2%	64,577.7	$9,563
Windsor ES	3,614.8	1,993.7	1,993.7	92,933.4	79,889.8	14%	279.8	$2.26	$632	4%	268.6	$607						
Sharon ES	22,649.9	16,304.0	16,304.0	92,933.4	79,889.8	14%	2,288.4	$0.96	$2,195	4%	2,196.8	$2,107	32,254.1	$0.1468	$4,735	2%	31,609.0	$4,640
TOTAL	209,024.8	163,247.7	163,247.7				14,308.8		$14,281		13,736.4	$13,710	161,457.2		$23,582		158,228.1	$23,111

Savings Calculation for Night Setback Control sequence
ASHRAE TMY-2 Weather Data

								Current Operating Schedule							Proposed Operating Schedule							
Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	M.C. Enthalpy Btu/lbma	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Total ProRated Bin Hours	Occup.Bin Hours	Unocc. Bin Hours	Occup. Indoor temp	Unocc. Indoor temp	Occup. heating Deg-hours	Unocc. heating Deg-hours	Total heating Deg-hours	Occup.Bin Hours	Unocc. Bin Hours	Occup. Indoor temp	Unocc. Indoor temp	Occup. heating Deg-hours	Unocc. heating Deg-hours	Total heating Deg-hours
								63%														
Heating																						
55 to 60	57.5	50.2	20.3	217.0	191.0	192.0	600	375	228.3	146.7	72	68	3,310.1	1,540.5	4,850.6	225.2	149.8	72.0	58.0	3,264.7	74.9	3,339.7
50 to 55	52.5	46.3	18.3	218.0	223.0	289.0	730	456	286.3	169.9	72	68	5,583.4	2,633.8	8,217.2	282.4	173.8	72.0	58.0	5,506.9	956.1	6,463.1
45 to 50	47.5	41.5	15.9	243.0	196.0	195.0	634	396	236.6	159.6	72	68	5,797.7	3,272.0	9,069.7	233.4	162.9	72.0	58.0	5,718.3	1,709.9	7,428.2
40 to 45	42.5	38.0	14.3	193.0	171.0	149.0	513	321	195.2	125.4	72	68	5,759.4	3,197.5	8,956.9	192.6	128.1	72.0	58.0	5,680.5	1,985.0	7,665.5
35 to 40	37.5	33.9	12.5	357.0	311.0	355.0	1,023	639	388.8	250.5	72	68	13,414.6	7,641.7	21,056.3	383.5	255.9	72.0	58.0	13,230.8	5,245.4	18,476.2
30 to 35	32.5	29.3	10.7	277.0	221.0	236.0	734	459	273.6	185.2	72	68	10,807.0	6,573.0	17,380.0	269.8	188.9	72.0	58.0	10,658.9	4,817.1	15,476.0
25 to 30	27.5	24.6	8.8	159.0	98.0	134.0	391	244	138.4	105.9	72	68	6,160.5	4,290.5	10,450.9	136.5	107.8	72.0	58.0	6,076.1	3,288.9	9,365.0
20 to 25	22.5	19.4	6.9	89.0	48.0	58.0	195	122	66.6	55.3	72	68	3,294.8	2,516.7	5,811.6	65.7	56.2	72.0	58.0	3,249.7	1,996.0	5,245.7
15 to 20	17.5	15.4	5.5	74.0	20.0	31.0	125	78	36.2	42.0	72	68	1,971.4	2,118.6	4,090.0	35.7	42.4	72.0	58.0	1,944.4	1,719.2	3,663.5
10 to 15	12.5	9.8	3.7	35.0	7.0	5.0	47	29	11.8	17.6	72	68	701.9	975.6	1,677.5	11.6	17.7	72.0	58.0	692.3	807.2	1,499.5
5 to 10	7.5	4.1	2.0	17.0	9.0	8.0	34	21	11.4	9.8	72	68	735.7	595.5	1,331.3	11.3	10.0	72.0	58.0	725.6	505.0	1,230.6
0 to 5	2.5	1.3	1.2	1.0	0.0	0.0	1	1	0.2	0.5	72	68	10.9	30.7	41.6	0.2	0.5	72.0	58.0	10.7	26.1	36.8
-5 to 0	(2.5)	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	72	68	0.0	0.0	0.0	0.0	0.0	72.0	58.0	0.0	0.0	0.0
-10 to -5	(7.5)	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	72	68	0.0	0.0	0.0	0.0	0.0	72.0	58.0	0.0	0.0	0.0
Total				1,880	1,495	1,652	5,027	3,142	1,873	1,268			57,547.3	35,386.2	92,933.4	1,847.8	1,294.1	1,008.0	812.0	56,758.9	23,130.8	79,889.8

NOTES:

Night Setback Savings Formulas:

Energy Savings(%) = (Current Heating deg-hrs-Proposed Heating Deg-Hrs)/Current Heating Deg-hrs x 100 x recovery factor

Total Energy Savings = Energy Savings During Setback(%) x Current heating fuel consumption(Therms/yr) x Heating Fuel Cost($/therm)

Please see interactive savings table for break-down of adjusted baseline.

Current heating Therms/yr was derived from fuel utility bills.

The new heating fuel consumption is derived by deducting savings from all other ECMs from the baseline consumption

Bin Hours Prorated for Heating Months Only

Electric Savings

	Current	Proposed
Occupied Space Temperature	72.0	74.0
Unoccup. Space Temperature	74.0	85.0

NIGHT SETBACK SAVINGS CALCULATIONS COOLING:

Description	Current kWh Usage	Baseline for Cooling	Adjusted Baseline for Cooling	Existing Cooling deg-hrs	Proposed Cooling deg-hrs	Energy Savings	Energy Savings	Energy Rate	Energy Savings	De-Rate	Energy Savings	Energy Savings

	kWh/yr	kWh/yr	kWh/yr	F	F	%	kWh/yr	$/kWh	$		kWh/yr	$
Robbinsville HS	2,578,800.0	259,050.0	259,050.0	9,577.2	7,236.7	24%	63,307.6	0.144	$9,089	2%	62,041.4	$8,907
Pond MS	1,505,300.0	299,600.0	299,600.0	9,577.2	7,236.7	22%	65,895.6	0.148	$9,758	2%	64,577.7	$9,563
Windsor ES												
Sharon ES	816,259.0	175,975.0	175,975.0	9,577.2	7,236.7	18%	32,254.1	0.147	$4,735	2%	31,609.0	$4,640
TOTAL	4,900,359.0	734,625.0	734,625.0				161,457.2		$23,582		158,228.1	$23,111

Savings Calculation for Night Setback Control sequence

ASHRAE TMY-2 Weather Data								Current Operating Schedule								Proposed Operating Schedule						
Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	M.C. Enthalpy Btu/lbm	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Pro-Rated Hours	Occup.Bin Hours	Unocc. Bin Hours	Occup. Indoor temp	Unocc. Indoor temp	Occup. Cooling Deg-hours	Unocc. Cooilng Deg-hours	Total Cooling Deg-hours	Occup.Bin Hours	Unocc. Bin Hours	Occup. Indoor temp	Unocc. Indoor temp	Occup. Cooling Deg-hours	Unocc. Cooilng Deg-hours	Total Cooling Deg-hours
Cooling								38%														
95 to 100	97.5	70.1	33.8	0	3	0	3	1	1	0.0	72	74	28.7	0.0	28.7	1.1	0.0	74.0	85.0	26.4	0.0	26.4
90 to 95	92.5	74.4	37.8	0	42	10	52	20	17	2.8	72	74	342.1	52.0	394.1	19.0	0.5	74.0	85.0	352.1	3.5	355.6
85 to 90	87.5	73.1	36.7	0	80	24	104	39	32	6.8	72	74	499.9	91.1	591.0	37.9	1.1	74.0	85.0	511.3	2.8	514.1
80 to 85	82.5	70.3	34.2	11	338	128	477	179	139	39.6	72	74	1,462.3	336.7	1,799.0	169.8	9.1	74.0	85.0	1,443.1	0.0	1,443.1
75 to 80	77.5	68.7	32.8	102	305	249	656	246	143	103.5	72	74	783.8	362.3	1,146.0	205.6	40.4	74.0	85.0	719.7	0.0	719.7
70 to 75	72.5	66.0	30.8	286	301	320	907	340	156	183.8	72	74	78.1	275.8	353.9	244.7	95.4	74.0	85.0	367.0	0.0	367.0
65 to 70	67.5	62.4	28.0	238	169	212	619	232	94	137.7	72	74	424.8	895.2	1,320.0	155.3	76.9	74.0	85.0	1,009.1	0.0	1,009.1
60 to 65	62.5	57.4	24.7	389	261	333	983	369	147	221.3	72	74	1,399.6	2,544.9	3,944.5	243.6	125.0	74.0	85.0	2,801.5	0.0	2,801.5
Total				1,026	1,499	1,276	3,801	1,425	730	696			5,019.3	4,557.9	9,577.2	1,077	348			7,230.4	6.3	7,236.7

NOTES:

Night Setback Savings Formulas:

Energy Savings(%) = (Current Cooling deg-hrs-Proposed Cooling Deg-Hrs)/Current Cooling Deg-hrs x 100 x Recovery factor

Total Energy Savings = Energy Savings During Setback(%) x Current Cooling Consumption kWh/yr) x Cooling Cost($/kWh)

Please see CDD Table for break-down of adjusted baseline.

Current cooling kwh/yr was derived from utility bills.

The cooling kWh consumption is derived from average CDD Philadelphia, PA

CDD Table		Robbinsville HS		Pond MS		Sharon ES	
Month	CDD	Total kWh	Cooling kWh	Total kWh	Cooling kWh	Total kWh	Cooling kWh
Apr	9.0	225,900.0	58,650.0	126,400.0	49,200.0	62,855.0	27,655.0
Mar	1.0	230,100.0	0.0	135,200.0	0.0	77,920.0	0.0
Feb	0.0	223,200.0	0.0	134,000.0	0.0	77,120.0	0.0
Jan	0.0	438,600.0	0.0	139,300.0	0.0	92,160.0	0.0
Dec	0.0	240,900.0	0.0	144,000.0	0.0	62,560.0	0.0
Nov	1.0	240,900.0	0.0	112,800.0	0.0	73,120.0	0.0
Oct	21.0	221,100.0	53,850.0	119,000.0	41,800.0	57,920.0	22,720.0
Sep	140.0	192,300.0	25,050.0	147,400.0	70,200.0	35,200.0	0.0
Aug	329.0	167,250.0	0.0	77,200.0	0.0	80,800.0	45,600.0
Jul	380.0	167,250.0	0.0	86,800.0	9,600.0	62,560.0	27,360.0
Jun	224.0	225,900.0	58,650.0	147,600.0	70,400.0	60,480.0	25,280.0
May	63.0	230,100.0	62,850.0	135,600.0	58,400.0	62,560.0	27,360.0
Apr	9.0	2,803,500.0	259,050.0	1,505,300.0	**299,600.0**	805,255.0	**175,975.0**
	1,177.0						

Greenhouse Gas Emissions (GHGs)								
Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	158,228.1	kwh/yr	0.000591900	Tons/kwh	93.7	Tons CO2/yr	16.4	9.9
Natural Gas	1,373.6	mmbtu/yr	0.058500000	Tons/mmBtu	80.4	Tons CO2/yr	14.0	8.5
Totals					174.0		30.4	18.3

VFD Savings

			A	B		C	D	E	F	G	H	I			
Item#	**BLDG.**	**EQUIPMENT DESCRIPTION**	**MOTOR SIZE (Hp)**	**MOTOR SIZE (kW)**	**MOTOR TYPE TEFC/ODP**	**OPERATING HOURS/YR**	**MOTOR LOAD**	**MOTOR EFFICENCY**	**EXISTING kW**	**ASSUMED NEW SPEED**	**NEW kW**	**SAVED kWh**	**HP**		**HP**
				A*.746				***NEMA***	**B*D/E**		**F*G^3**	**(F-H)*C**			
1	Robbinsville HS	CWP 1A	30	22.38	TEFC	475	50%	91.2%	12.27	70%	4.21	3,830	30		**30.00**
2	Robbinsville HS	CWP 1B	30	22.38	TEFC	475	50%	91.2%	12.27	70%	4.21	3,830	30		**30.00**
3	Robbinsville HS	CWP 1C	30	22.38	TEFC	475	50%	89.5%	12.50	70%	4.29	3,903	30		**30.00**
6	Robbinsville HS	HWP 1A	20	14.92	TEFC	1,873	50%	89.5%	8.34	70%	2.86	10,259	20		**20.00**
7	Robbinsville HS	HWP 1B	20	14.92	TEFC	1,873	50%	89.5%	8.34	70%	2.86	10,259	20		
												32,082			

Exhibit D5-3B.1
Robbinsville School District
ECM 3B Install CO2 Sensors in Air Handling Units - Demand Control Ventilation
Building Management Systems

ECM Description:
Install CO2 Sensors in Air Handling Units - Demand Control Ventilation
Summary of Annual Energy Savings:

kWh	2,402
Therms	6,441

Assumptions, Clarifications, Deletions:
DCV is a method of controlling the ventilation in a space based on the actual occupancy using CO2 sensors. Building HVAC ventilation systems are designed to provide fresh air to the maximum design occupancy of the space. But not all spaces are at the maximum occupancy all of the time.

Assume Demand Control Ventilation (DCV) can typically reduce HVAC cost in most buildings by 5% to 20%.
Calculation Formulas
Heating Savings = Decreased OA * Sensible Heat Factor * Heating Degree Hours/100,000/Boiler Eff
Cooling Savings = Decresed OA * Sensible Heat Factor * Cooling degree hours / 3,412/ COP
Measurement & Verification:
OPTION A Stipulated Savings - Electric
OPTION C - Utility Bill Analysis. - Thermal
Commissioning:
Third Party commissioning as per NJ ESIP

	School	Robbinsville HS	Pond MS	Sharon ES		Totals	
C1	OutdoorAir Requirements for Ventilation	15	15	15			CFM/Person
C2	Maximum Occupancy						Occupancy per 1000 SF
C3	Gym	938	680	274			30
C4	Auditorium	1,000					150
C5	Multipurpose/Aux Gym	861	241				150
C6	Cafeteria						100
C7	Total Occupancy	2,799	921	274			SUM(C3:C6)
C8	Outside Air Required at Full Occupancy	41,985	13,815	4,104			C7*C1
C9	Total Number of Units	6	4	2		12	
C10	Estimated Decrease in Outside Air Requirement	15.0%	15.0%	15.0%			5% - 20%
C11	Sensible Heat Factor	1.08	1.08	1.08			
C12	Average Indoor Temperature Heating	72	72	72			
C13	Average Indoor Temperature Cooling	74	74	74			
C14	Boiler Efficiency	85%	85%	65%			
C15	Cooling Efficiency COP	3.0	3.0	3.0			
C16	Heating Therms Saved per year	4,605	1,515	589		6,709	(C10*C8)*C11*Htg Deg Hrs/100000/C14
C17	Sensible Cooling kWh Saved per year * (see Note - 1)	2,071	178	202		2,451	(C10*C8)*C11*Clg Deg Hrs/3412/C15
C18	Cost of Cooling	$0.1436	$0.1788	$0.1468			
C19	Cost of Heating	$0.9130	$1.1213	$0.9591			
C20	Cooling Savings $$	$297	$32	$30		$359	C18*C17
C21	Heating Savings $$	$4,204	$1,699	$565		$6,468	C19*C16
C22	De-Rate Cooling	2%	2%	2%			
C23	De-Rate Heating	4%	4%	4%			
C24	Heating Therms	4,421	1,455	565		6,441	(1-C23)*C16
C25	Cooling kWh	2,029	175	198		2,402	(1-C22)*C17
C26	Heating $$	$4,036	$1,631	$542		$6,209	C24*C19
C27	Cooling $$	$291	$31	$29		$352	C25*C18

* Note 1 - Cooling in Memorial Cafeteria Only : (C10*C6*C1)*C11*Clg Deg Hrs/3412/C15

ASHRAE TMY-2 Weather Data

Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	M.C. Enthalpy Btu/lbm	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Pro-Rated Hours	Occup.Bin Hours	Occup. Indoor temp	Occup. heating Deg-hours
Heating								63%			
55 to 60	57.5	50.2	20.3	217	191	192	600	375	228	72.0	3,310.1
50 to 55	52.5	46.3	18.3	218	223	289	730	456	286	72.0	5,583.4
45 to 50	47.5	41.5	15.9	243	196	195	634	396	237	72.0	5,797.7
40 to 45	42.5	38.0	14.3	193	171	149	513	321	195	72.0	5,759.4
35 to 40	37.5	33.9	12.5	357	311	355	1,023	639	389	72.0	13,414.6
30 to 35	32.5	29.3	10.7	277	221	236	734	459	274	72.0	10,807.0
25 to 30	27.5	24.6	8.8	159	98	134	391	244	138	72.0	6,160.5
20 to 25	22.5	19.4	6.9	89	48	58	195	122	67	72.0	3,294.8
15 to 20	17.5	15.4	5.5	74	20	31	125	78	36	72.0	1,971.4
10 to 15	12.5	9.8	3.7	35	7	5	47	29	12	72.0	701.9
5 to 10	7.5	4.1	2.0	17	9	8	34	21	11	72.0	735.7
0 to 5	2.5	1.3	1.2	1	0	0	1	1	0	72.0	10.9
-5 to 0	(2.5)	0.0	0.0	0	0	0	0	0	0	72.0	0.0
-10 to -5	(7.5)	0.0	0.0	0	0	0	0	0	0	72.0	0.0
Total				1,880	1,495	1,652	5,027	3,142	1,873		57,547.3

ASHRAE TMY-2 Weather Data **Current Operating Schedule**

Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	M.C. Enthalpy Btu/lbm	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Pro-Rated Hours	Occup.Bin Hours	Occup. Indoor temp	Occup. Cooling Deg-hours
Cooling								38%			
95 to 100	97.5	72.6	36.0	0	5	1	6	2	2	74	49.6
90 to 95	92.5	74.1	37.5	0	33	7	40	15	14	74	259.3
85 to 90	87.5	71.8	35.4	0	92	30	122	46	42	74	560.7
80 to 85	82.5	69.4	33.4	8	330	162	500	188	162	74	1,381.0
75 to 80	77.5	67.4	31.8	98	257	265	620	233	168	74	586.9
70 to 75	72.5	64.6	29.6	325	236	286	847	318	186	74	279.0
Total				431	953	751	2,135	801	574		3,116.4

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	2,402	kwh/yr	0.000592	Tons/kwh	1.4	Tons CO2/yr	0.2	0.1
Natural Gas	644	mmbtu/yr	0.058500	Tons/mmBtu	37.7	Tons CO2/yr	6.6	4.0
#2 Fuel Oil		gal/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**39.1**		**6.8**	**4.1**

Exhibit D5-4A.1
Robbinsville School District
ECM 4A   Building Envelope Improvements
Building Envelope Improvements

ECM Description:

Building Envelope Improvements

Summary of Annual Energy Savings:

kWh 26,035
Therms 11,043

Assumptions, Clarifications, Deletions:

The building was inspected visually and using smoke tracer tests in accordance with ASTM E-1186 – 03. A smoke puffer was used to identify the location and severity of air leakage paths. These air leakage paths are detailed in the scope of work below. Areas inspected include: roof-wall joints, elevation changes, soffit areas, roofs, walls, windows, doors and other penetrations.

Calculation Formulas

Heating Savings = Flow Factor x Pressure Diff. x Crack Area x HDD/ Heating Eff. Factor / 100,000
Cooling Savings = 4.5 x CFM x Enthalpy x 1.2 x CDD

Measurement & Verification:

OPTION A Stipulated Savings - Electric
OPTION C - Utility Bill Analysis. - Thermal

Commissioning:

Third Party commissioning as per NJ ESIP

Data and Calculations:

		Robbinsville HS	Pond MS	Windsor ES	Sharon ES		Total	
C1	**Crack Area**	17.74	37.93	2.91	31.04			
C2	**Thermal Savings (mmBtu)**	274.27	455.23	48.18	372.60			
C3	**Electric Savings (mmBtu)**	20.66	36.62	3.39	29.98			
C4	**Thermal Savings (Therms)**	2,743	4,552	482	3,726			
C5	**Electric Savings(kWh)**	6,055	10,733	993	8,785			
C6	**Fuel Cost**	$ 1.08	$ 1.10	$ 2.21	$ 1.18			
C7	**$/kWh**	$ 0.19	$ 0.21	$ 0.17	$ 0.16			
C8	**Diversity Factor Thermal**	100%	100%	100%	100%			
C8	**Diversity Factor Electric**	100%	100%	100%	100%			
C16	**Therms**	2,743	4,552	482	3,726		**11,503**	
C17	**Savings Therm $$**	$2,952	$5,005	$1,064	$4,401		**$13,423**	
C13	**kWh**	6,054.60	10,733.50	993	8,785.19		**26,566**	
C19	**Savings Electric $$**	$1,157	$2,217	$165	$1,366		**$4,904**	
C20	**Derate Therms**	4%	4%	4%	4%			
C21	**Derate Electric**	2%	2%	2%	2%			
C22	**Therms**	2,633	4,370	463	3,577		**11,043**	
C23	**Therm $$**	$2,834	$4,805	$1,022	$4,225		**$12,886**	
C24	**kWh**	5,934	10,519	973	8,609		**26,035**	
C25	**Savings Electric**	$1,133	$2,172	$162	$1,339		**$4,806**	

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	26,035	kwh/yr	0.000592	Tons/kwh	15.4	Tons CO2/yr	2.7	1.6
Natural Gas	1,104	mmbtu/yr	0.058500	Tons/mmBtu	64.6	Tons CO2/yr	11.3	6.8
#2 Fuel Oil	-	mmbtu/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**80.0**		**14.0**	**8.4**

Exhibit D5-4A.2
Robbinsville School District
ECM 4 - Building Envelope and Insulation Improvements
Building Envelope Improvements Robbinsville HS

CALCULATIONS Ref. # = 1 **Robbinsville HS**
Air Leakage Measures

Heating Savings

1) Heating Occupied

	CFM$_{ho}$		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Heating Setpoint - Occupied		Avg Outdoor Air Temp During Heating Occ Bins		Wind Coefficient (C_W)		Avg Wind Velocity $(V)^2$
Q$_{ho}$	1,525	=	17.74	x	144	x	50%	x	0.02990	x	72	-	42.3	+	0.00860	x	62.41

	Occupied Heating Therms		Constant (Rho)		Q Heating Occupied		Heating Setpoint - Occupied		Avg Outdoor Air Temp Heat during Heat Occ Bins		% of Hrs/wk Actual Bldg Occupancy		Heating Season Bin Hours - Occupied		BTUs/Unit		Efficiency Of Heating System
Consumption Therms	######	=	1.08	x	1,525	x	72	-	42.3	x	35.71%	x	4933	÷	100,000	÷	75.0%

	Occupied Heating $		Occupied Heating Therms		Fuel Cost Per Unit	Cost/MMBtu	Fuel Type	Fuel Unit
COST$_{ho}$	$956.80	=	######	x	$0.83292	$8.33	Natural Gas	Therms

2) Heating Unoccupied

	CFM$_{hu}$		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Heating Setpoint - Unoccupied		Avg Outdoor Air Temp During Heating Unocc Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
Q$_{hu}$	1,458	=	17.74	x	144	x	50%	x	0.02990	x	67	-	41.4	+	0.00860	x	62.41

	Unoccupied Heating Therms		Constant (Rho)		Q Heating Unoccupied		Heating Setpoint - Unoccupied		Avg Outdoor Air Temp Heat during Heat Unocc Bins		% of Hrs/wk Actual Bldg Setback		Heating Season Bin Hours - Unoccupied		BTUs/Unit		Efficiency Of Heating System
Consumption Therms	######	=	1.08	x	1,458	x	67	-	42.3	x	64.29%	x	4783	÷	100,000	÷	75.0%

	Unoccupied Heating $		Unoccupied Heating Therms		Fuel Cost Per Unit	Cost/MMBtu	Fuel Type	Fuel Unit
COST$_{hu}$	#######	=	######	x	$0.83292	$8.33	Natural Gas	Therms

(1+2) TOTAL HEATING COSTS

	Occupied and Unoccupied Heating $		Fuel Cost		Occupied & Unoccupied Heating Therms
TOTAL HEATING COSTS	#######	=	$0.83292	x	######

CoolingSavings

3) Cooling Occupied

	CFM$_{co}$		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Cooling Setpoint - Occupied		Avg Outdoor Air Temp During Cooling Occ Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
Q$_{co}$	1,112	=	17.74	x	144	x	50%	x	0.02990	x	73	-	80.4	+	0.00860	x	62.41

	Ton-Hours	Heat Factor Constant (Ct)	Q Cooling Occupied	Avg Outdoor Air Enthalpy Cooling Occ Bins	Cooling Supply air Enthalpy	% of Hrs/wk Actual Bldg Occupancy	Cooling Season Bin Hours - Occupied	% of Facility that is Cooled	Btu/hrs per Ton of Cooling
Cooling Occupied									

Consumption (ton hours)	2,424.9	=	4.5	x	1,112	x	34	-	22.7	x	35.71%	x	1601	÷	90%	+	12000

	Occupied Cooling kWh		Ton-Hours		kW/ton		kW of Support Equip
Consumption (kWh)	**2,910**	=	2,425	x	1.20	+	

	Occupied Cooling $		Rate/kWh		kWh saved	Cost/MMBtu	Fuel Type	Fuel Unit	Btus/Unit
$COST_{cu}$	**$412.23**	=	$0.14167	x	2,910	$41.52	Electricity	kWh	3412

		CFM_{cu}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Cooling Setpoint - Unoccupied		Avg Outdoor Air Temp During Cooling Unocc Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
4)	Q_{cu}	**1,079**	=	17.74	x	144	x	50%	x	0.02990	x	78	-	83.9	+	0.00860	x	62.41

Cooling Unoccupied

	Ton-Hours		Heat Factor Constant (Ct)		Q Cooling Unoccupied		Avg Outdoor Air Enthalpy Cooling UnOcc Bins		Cooling Supply air Enthalpy		% of Hrs/wk Actual Bldg Setback		Cooling Season Bin Hours - Unoccupied		% of Facility that is Cooled		Btu/hrs per Ton of Cooling
Consumption (ton hours)	2,620.6	=	4.5	x	1,079	x	34	-	22.7	x	64.29%	x	991	÷	90%	+	12000

	Unoccupied Cooling kWh		Ton-Hours		kW/ton		kW of Support Equip
Consumption (kWh)	**3,145**	=	2,621	x	1.20	+	

	Unoccupied Cooling $		Rate/kWh		kWh saved	Cost/MMBtu	Fuel Type	Fuel Unit	Btus/Unit
$COST_{cu}$	**$445.50**	=	$0.14167	x	3,145	$41.52	Electricity	kWh	3412

		Occupied and Unoccupied		Rate/kWh		kWh saved
(3+4)	TOTAL COOLING COSTS	**$857.73**	=	$0.14167	x	6,054.6

5)	**+/- Factor:**	....	=	
6)	**Combined Heating/Cooling Cost of Air Leakage (Savings):**	....	=	**$3,142.20**
7)	**Cost to Rectify Air Leakage:**	....	=	**$22,694.00**
8)	**Payback: Item 7/Item 6:**	....	=	**7.22**

Payback = **7.2** **Years**

HOLE AREA "A" BASED UPON:

Single door - sweep & W/S: 31 doors x 20' perimeter x 1/8 in. crack	=	**6.46 FT.^{2}**
crack	=	**1.22 FT.^{2}**
Single door - sweep only: 0 doors x 3' x 1/16 in. crack	=	**0.00 FT.^{2}**
Door, center only: 0 doors x 3' x 1/16 in. crack	=	**0.00 FT.^{2}**
Seal and W/S non-standard doors - 276 lineal feet x 1/8 in. crack	=	**2.88 FT.^{2}**
Overhead Doors (Sectional) W/S: 0 lineal ft x 1/8 in. crack	=	**0.00 FT.^{2}**
Overhead Doors (Roll-up) W/S: 8 lineal ft x 1/8 in. crack	=	**0.08 FT.^{2}**
Overhead Doors: 1 priced each	=	**0.00 FT.^{2}**
Window Glazing Exterior 0 lineal feet x 1/128in. crack	=	**0.00 FT.^{2}**
Window Glazing Interior 0 lineal feet x 1/128 in. crack	=	**0.00 FT.^{2}**

Window W/S - standard: 0 lineal ft x 1/32 in. crack	=	0.00 FT.^{2}
Window W/S - Cast-in-place: 0 lineal ft x 1/32 in. crack	=	0.00 FT.^{2}
Skylight seal 688 lineal feet x 1/32 in crack	=	1.79 FT.^{2}
Seal 0 lineal feet SPECIFY x 1/64 in. crack	=	0.00 FT.^{2}
Seal Ext. Remove & Replace 0 lineal ft x 1/64 in. crack	=	0.00 FT.^{2}
Roof-Wall Joint 1 line 0 lineal feet x 1/16 in.crack	=	0.00 FT.^{2}
Roof-Wall Joint 2 line 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Roof-Wall Joint 3 line 0 lineal feet x 3/16 in.crack	=	0.00 FT.^{2}
Soffits - low/easy: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Soffits - high/hard: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Drop Soffits: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
34 Roof Top Fans x 10' perimeter x 3/16 in. crack	=	5.31 FT.^{2}
RTUs/AHUs 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Seal Open-Topped Walls 0 lineal feet x 1/16 in.crack	=	0.00 FT.^{2}
Sealing Top Plates 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Duct/Fan Boot Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Duct/Fan Boot Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Recessed Lights: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Electrical Boxes: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Pipe Penetrations: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Wire Penetrations: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Plumbing/ Duct Penetration Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Plumbing/ Duct Penetration Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Flue/Chimney Penetration Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Flue/Chimney Penetration Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Penetrations: 0	=	0.00 FT.^{2}
Penetrations: 1	=	0.00 FT.^{2}
Boiler Rooms: 1 rooms at combo price	=	0.00 FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00 FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00 FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00 FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00 FT.^{2}
TOTAL:	=	17.74 FT.^{2}

Conductive Measures

Measure:

Assumptions:

One

U value Pre =	Area - Sq. Ft. =	Payback in Years =	#DIV/0!
U Value Post =	Cost of retrofit =		

Heating				Cooling				Total Annual	
Heating System Efficiency	75%			Cooling System Efficiency	100%				
Fuel cost MMBtu - heating	$8.3292			Fuel cost MMBtu - cooling	$41.5198				
Occupied		Unoccupied		Occupied		Unoccupied			
Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
Measure $ Loss - Pı	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pı	$0.00
Measure $ Loss - Pc	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pc	$0.00
Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savi	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00

Total	
Annual $ Conductive Savings - heating	$ -
Annual $ Conductive Savings - cooling	$ -
Annual $ Conductive Savings - Total	$ -
Payback in years	#DIV/0!

Measure:

Assumptions:

Two

U value Pre =	Area - Sq. Ft. =	Payback in Years =	#DIV/0!
U Value Post =	Cost of retrofit =		

Heating				Cooling				Total Annual	
Heating System Efficiency	75%			Cooling System Efficiency	100%				
Fuel cost MMBtu - heating	$8.3292			Fuel cost MMBtu - cooling	$41.5198				
Occupied		Unoccupied		Occupied		Unoccupied			
Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
Measure $ Loss - Pı	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pı	$0.00
Measure $ Loss - Pc	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pc	$0.00
Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savi	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00

Total	
Annual $ Conductive Savings - heating	$ -

Annual $ Conductive Savings - cooling	$	-
Annual $ Conductive Savings - Total	$	-
Payback in years	#DIV/0!	

Measure:										
Assumptions:										
Three	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency	75%			Cooling System Efficiency	100%				
	Fuel cost MMBtu - heating	$8.3292			Fuel cost MMBtu - cooling	$41.5198				
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pı	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pı	$0.00
	Measure $ Loss - Po	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Po	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savi	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00
	Total									
	Annual $ Conductive Savings - heating	$ -								
	Annual $ Conductive Savings - cooling	$ -								
	Annual $ Conductive Savings - Total	$ -								
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Four	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency	75%			Cooling System Efficiency	100%				
	Fuel cost MMBtu - heating	$8.3292			Fuel cost MMBtu - cooling	$41.5198				
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pı	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pı	$0.00
	Measure $ Loss - Po	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Po	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savi	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00
	Total									
	Annual $ Conductive Savings - heating	$ -								
	Annual $ Conductive Savings - cooling	$ -								
	Annual $ Conductive Savings - Total	$ -								
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Five	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency	75%			Cooling System Efficiency	0%				
	Fuel cost MMBtu - heating	$8.3292			Fuel cost MMBtu - cooling	$41.5198				
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pı	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pı	$0.00
	Measure $ Loss - Po	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Po	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savi	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00
	Total									
	Annual $ Conductive Savings - heating	$ -								
	Annual $ Conductive Savings - cooling	$ -								
	Annual $ Conductive Savings - Total	$ -								
	Payback in years	#DIV/0!								

Exhibit D5-4A.3
Robbinsville School District
ECM 4 - Building Envelope and Insulation Improvements
Building Envelope Improvements Pond MS

CALCULATIONS | **Ref. # =** 2 | **Pond Middle School**
Air Leakage Measures

Heating Savings

		CFM_{ho}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Heating Setpoint - Occupied		Avg Outdoor Air Temp During Heating Occ Bins		Wind Coefficient (C_W)		Avg Wind Velocity $(V)^2$
1)	Q_{ho}	**2,519**	=	37.93	x	144	x	50%	x	0.01500	x	72	-	42.3	+	0.00650	x	62.41

Heating Occupied

	Occupied Heating Therms		Constant (Rho)		Q Heating Occupied		Heating Setpoint - Occupied		Avg Outdoor Air Temp during Heat Occ Bins		% of Hrs/wk Actual Bldg Occupancy		Heating Season Bin Hours - Occupied		BTUs/Unit		Efficiency Of Heating System
Consumption Therms	1,898.35	=	1.08	x	2,519	x	72	-	42.3	x	35.71%	x	4933	÷	100,000	÷	75.0%

	Occupied Heating $		Occupied Heating Therms		Fuel Cost Per Unit	Cost/MMBtu	Fuel Type	Fuel Unit
$COST_{ho}$	**$1,894.82**	=	1,898.35	x	$0.99814	$9.98	Natural Gas	Therms

		CFM_{hu}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Heating Setpoint - Unoccupied		Avg Outdoor Air Temp During Heating Unocc Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
2)	Q_{hu}	**2,427**	=	37.93	x	144	x	50%	x	0.01500	x	67	-	41.4	+	0.00650	x	62.41

Heating Unoccupied

	Unoccupied Heating Therms		Constant (Rho)		Q Heating Unoccupied		Heating Setpoint - Unoccupied		Avg Outdoor Air Temp during Heat Unocc Bins		% of Hrs/wk Actual Bldg Setback		Heating Season Bin Hours - Unoccupied		BTUs/Unit		Efficiency Of Heating System
Consumption Therms	2,653.95	=	1.08	x	2,427	x	67	-	42.3	x	64.29%	x	4783	÷	100,000	÷	75.0%

	Unoccupied Heating $		Unoccupied Heating Therms		Fuel Cost Per Unit	Cost/MMBtu	Fuel Type	Fuel Unit
$COST_{hu}$	**$2,649.02**	=	2,653.95	x	$0.99814	$9.98	Natural Gas	Therms

		Occupied and Unoccupied Heating $		Fuel Cost		Occupied & Unoccupied Heating Therms
(1+2)	**TOTAL HEATING COSTS**	**$4,543.84**	=	$0.99814	x	#######

CoolingSavings

		CFM_{co}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Cooling Setpoint - Occupied		Avg Outdoor Air Temp During Cooling Occ Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
3)	Q_{co}	**1,963**	=	37.93	x	144	x	50%	x	0.01500	x	73	-	80.4	+	0.00650	x	62.41

Cooling Occupied

	Ton-Hours		Heat Factor Constant (Ct)		Q Cooling Occupied		Avg Outdoor Air Enthalpy Cooling Occ Bins		Cooling Supply air Enthalpy		% of Hrs/wk Actual Bldg Occupancy		Cooling Season Bin Hours - Occupied		% of Facility that is Cooled		Btu/hrs per Ton of Cooling
Consumption (ton hours)	4,280.4	=	4.5	x	1,963	x	34	-	22.7	x	35.71%	x	1601	÷	90%	+	12000

	Occupied Cooling kWh		Ton-Hours		kW/ton		kW of Support Equip
Consumption (kWh)	**5,137**	=	4,280	x	1.20	+	

	Occupied Cooling $		Rate/kWh		kWh saved	Cost/MMBtu	Fuel Type	Fuel Unit	Btus/Unit
$COST_{cu}$	**$750.80**	=	$0.14617	x	5,137	$42.84	Electricity	kWh	3412

		CFM_{cu}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Cooling Setpoint - Unoccupied		Avg Outdoor Air Temp During Cooling Unocc Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
4)	Q_{cu}	1,920	=	37.93	x	144	x	50%	x	0.01500	x	78	-	83.9	+	0.00650	x	62.41

Cooling Unoccupied

	Ton-Hours		Heat Factor Constant (Ct)		Q Cooling Unoccupied		Avg Outdoor Air Enthalpy Cooling UnOcc Bins		Cooling Supply air Enthalpy		% of Hrs/wk Actual Bldg Setback		Cooling Season Bin Hours - Unoccupied		% of Facility that is Cooled		Btu/hrs per Ton of Cooling
Consumption (ton hours)	4,664.2	=	4.5	x	1,920	x	34	-	22.7	x	64.29%	x	991	÷	90%	+	12000

	Unoccupied Cooling kWh		Ton-Hours		kW/ton		kW of Support Equip
Consumption (kWh)	5,597	=	4,664	x	1.20	+	

	Unoccupied Cooling $		Rate/kWh		kWh saved	Cost/MMBtu	Fuel Type	Fuel Unit	Btus/Unit
$COST_{cu}$	$818.11	=	$0.14617	x	5,597	$42.84	Electricity	kWh	3412

		Occupied and Unoccupied		Rate/kWh		kWh saved
(3+4)	TOTAL COOLING COSTS	$1,568.90	=	$0.14617	x	10,733.5

5)	+/- Factor:	.... =	
6)	Combined Heating/Cooling Cost of Air Leakage (Savings):	.... =	$6,112.74
7)	Cost to Rectify Air Leakage:	.... =	$77,003.00
8)	Payback: Item 7/Item 6:	.... =	12.60

Payback = 12.6 Years

HOLE AREA "A" BASED UPON:

Single door - sweep & W/S: 55 doors x 20' perimeter x 1/16 in. crack	=	5.73 $FT.^2$
Double Doors, sweep & center W/S: 0 door sets x 13' perimeter x 1/16 in. crack	=	0.00 $FT.^2$
Single door - sweep only: 0 doors x 3' x 1/16 in. crack	=	0.00 $FT.^2$
Door, center only: 0 doors x 3' x 1/16 in. crack	=	0.00 $FT.^2$
Seal and W/S non-standard doors - 13 lineal feet x 1/16 in. crack	=	0.07 $FT.^2$
Overhead Doors (Sectional) W/S: 56 lineal ft x 1/8 in. crack	=	0.58 $FT.^2$
Overhead Doors (Roll-up) W/S: 0 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Overhead Doors: 1 priced each	=	0.00 $FT.^2$
Window Glazing Exterior 0 lineal feet x 1/128in. crack	=	0.00 $FT.^2$
Window Glazing Interior 0 lineal feet x 1/128 in. crack	=	0.00 $FT.^2$
Window W/S - standard: 0 lineal ft x 1/32 in. crack	=	0.00 $FT.^2$
Window W/S - Cast-in-place: 0 lineal ft x 1/32 in. crack	=	0.00 $FT.^2$
Skylight seal 520 lineal feet x 1/64 in crack	=	0.68 $FT.^2$
Seal 13 lineal feet hatch frame-to-roof x 1/64 in. crack	=	0.02 $FT.^2$
Seal Ext. Remove & Replace 0 lineal ft x 1/64 in. crack	=	0.00 $FT.^2$
Roof-Wall Joint 1 line 3104 lineal feet x 1/16 in.crack	=	16.17 $FT.^2$
Roof-Wall Joint 2 line 0 lineal feet x 1/8 in.crack	=	0.00 $FT.^2$
Roof-Wall Joint 3 line 0 lineal feet x 3/16 in.crack	=	0.00 $FT.^2$
Soffits - low/easy: 0 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Soffits - high/hard: 0 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Drop Soffits: 0 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
55 Roof Top Fans x 10' perimeter x 1/8 in. crack	=	5.73 $FT.^2$
RTUs/AHUs 0 lineal feet x 1/8 in.crack	=	0.00 $FT.^2$
Seal Open-Topped Walls 0 lineal feet x 1/16 in.crack	=	0.00 $FT.^2$
Sealing Top Plates 0 lineal feet x 1/8 in.crack	=	0.00 $FT.^2$
Duct/Fan Boot Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Duct/Fan Boot Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Recessed Lights: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Electrical Boxes: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Pipe Penetrations: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Wire Penetrations: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Plumbing/ Duct Penetration Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Plumbing/ Duct Penetration Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Flue/Chimney Penetration Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Flue/Chimney Penetration Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 $FT.^2$
Penetrations: 0	=	0.00 $FT.^2$

Penetrations: 1	=	0.00	FT.^{2}
Boiler Rooms: 1 rooms at combo price	=	0.00	FT.^{2}
Roof/Wall Joint - 1 line with intumescent barrier 1 at 146 lineal feet at 1/16 in crack	=	0.76	FT.^{2}
Roof/Wall Joint - 1 line at 18' 1 at 1116 lineal feet at 1/16 in crack	=	5.81	FT.^{2}
Roof/Wall Joint - 1 line at 26' 1 at 458 lineal feet at 1/16 in crack	=	2.39	FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00	FT.^{2}
TOTAL:	=	37.93	FT.^{2}

Conductive Measures

Measure:										
Assumptions:										
One	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$9.9814		Fuel cost MMBtu - cooling		$42.8397			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Two	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$9.9814		Fuel cost MMBtu - cooling		$42.8397			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Three	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$9.9814		Fuel cost MMBtu - cooling		$42.8397			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Four	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$9.9814		Fuel cost MMBtu - cooling		$42.8397			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00

Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00

Total	
Annual $ Conductive Savings - heating	$ -
Annual $ Conductive Savings - cooling	$ -
Annual $ Conductive Savings - Total	$ -
Payback in years	#DIV/0!

Measure:
Assumptions:

Five	U value Pre =		Area - Sq. Ft. =	Payback in Years =	#DIV/0!
	U Value Post =		Cost of retrofit =		

Heating				Cooling				Total Annual	
Heating System Efficiency		75%		Cooling System Efficiency		0%			
Fuel cost MMBtu - heating		$9.9814		Fuel cost MMBtu - cooling		$42.8397			
Occupied		Unoccupied		Occupied		Unoccupied			
Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00

Total	
Annual $ Conductive Savings - heating	$ -
Annual $ Conductive Savings - cooling	$ -
Annual $ Conductive Savings - Total	$ -
Payback in years	#DIV/0!

Exhibit D5-4A.4
Robbinsville School District
ECM 4 - Building Envelope and Insulation Improvements
Building Envelope Improvements Windsor ES

Heating Savings

1)

	CFM$_{ho}$		Existing Crack Area In Sq Ft		Conversi on Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Heating Setpoint - Occupie d		Avg Outdoor Air Temp During Heating Occ Bins		Wind Coefficie nt (C_W)		Avg Wind Velocity $(V)^2$
Q$_{ho}$	**250**	=	2.91	x	144	x	50%	x	0.02990	x	72	-	42.3	+	0.00860	x	62.41

Heating Occupied

	Occupie d Heating Therms		Constant (Rho)		Q Heating Occupie d		Heating Setpoint - Occupied		Avg Outdoor Air Temp Heat during Heat Occ Bins		% of Hrs/wk Actual Bldg Occupan cy		Heating Season Bin Hours - Occupie d		BTUs/Un it		Efficienc y Of Heating System
Consumption Therms	201.81	=	1.08	x	250	x	72	-	42.3	x	35.71%	x	4933	÷	100,000	÷	70.0%

	Occupie d Heating $		Occupie d Heating Therms		Fuel Cost Per Unit	Cost/MMBtu	Fuel Type	Fuel Unit
COST$_{ho}$	**$456.09**	=	201.81	x	$2.26005	$22.60	#2 Fuel Oil	Therms

2)

	CFM$_{hu}$		Existing Crack Area In Sq Ft		Conversi on Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Heating Setpoint - Unoccup ied		Avg Outdoor Air Temp During Heating Unocc Bins		Wind Coefficie nt (C_W)		Avg Wind Velocity (V^2)
Q$_{hu}$	**239**	=	2.91	x	144	x	50%	x	0.02990	x	67	-	41.4	+	0.00860	x	62.41

Heating Unoccupied

	Unoccup ied Heating Therms		Constant (Rho)		Q Heating Unoccup ied		Heating Setpoint - Unoccupied		Avg Outdoor Air Temp Heat during Heat Unocc Bins		% of Hrs/wk Actual Bldg Setback		Heating Season Bin Hours - Unoccup ied		BTUs/Un it		Efficienc y Of Heating System
Consumption Therms	280.03	=	1.08	x	239	x	67	-	42.3	x	64.29%	x	4783	÷	100,000	÷	70.0%

	Unoccup ied Heating $		Unoccup ied Heating Therms		Fuel Cost Per Unit	Cost/MMBtu	Fuel Type	Fuel Unit
COST$_{hu}$	**$632.87**	=	280.03	x	$2.26005	$22.60	#2 Fuel Oil	Therms

		Occupie d and Unoccup ied Heating $		Fuel Cost		Occupie d & Unoccup ied Heating Therms
(1+2)	**TOTAL HEATING COSTS**	########	=	$2.26005	x	481.83

CoolingSavings

3)

	CFM$_{co}$		Existing Crack Area In Sq Ft		Conversi on Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Cooling Setpoint - Occupie d		Avg Outdoor Air Temp During Cooling Occ Bins		Wind Coefficie nt (C_W)		Avg Wind Velocity (V^2)
Q$_{co}$	**182**	=	2.91	x	144	x	50%	x	0.02990	x	73	-	80.4	+	0.00860	x	62.41

Cooling Occupied

	Ton-Hours		Heat Factor Constant (Ct)		Q Cooling Occupie d		Avg Outdoor Air Enthalpy Cooling Occ Bins		Cooling Supply air Enthalpy		% of Hrs/wk Actual Bldg Occupan cy		Cooling Season Bin Hours - Occupie d		% of Facility that is Cooled		Btu/hrs per Ton of Cooling
Consumption (ton hours)	397.6	=	4.5	x	182	x	34	-	22.7	x	35.71%	x	1601	÷	90%	+	12000

	Occupie d Cooling kWh		Ton-Hours		kW/ton		kW of Support Equip
Consumption (kWh)	**477**	=	398	x	1.20	+	

Occupie d Cooling $	Rate/kWh	kWh saved	Cost/MMBtu	Fuel Type	Fuel Unit	Btus/Uni t

	COST$_{cu}$	**$86.35**	=	$0.18098	x	477				$53.04		Electricity		kWh		3412	

		CFM$_{cu}$		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Cooling Setpoint - Unoccupied		Avg Outdoor Air Temp During Cooling Unocc Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
4)	Q$_{cu}$	**177**	=	2.91	x	144	x	50%	x	0.02990	x	78	-	83.9	+	0.00860	x	62.41

Cooling Unoccupied

	Ton-Hours		Heat Factor Constant (Ct)		Q Cooling Unoccupied		Avg Outdoor Air Enthalpy Cooling UnOcc Bins		Cooling Supply air Enthalpy		% of Hrs/wk Actual Bldg Setback		Cooling Season Bin Hours - Unoccupied		% of Facility that is Cooled		Btu/hrs per Ton of Cooling
Consumption (ton hours)	429.7	=	4.5	x	177	x	34	-	22.7	x	64.29%	x	991	÷	90%	+	12000

	Unoccupied Cooling kWh		Ton-Hours		kW/ton		kW of Support Equip
Consumption (kWh)	**516**	=	430	x	1.20	+	

	Unoccupied Cooling $		Rate/kWh		kWh saved				Cost/MMBtu		Fuel Type		Fuel Unit		Btus/Unit
COST$_{cu}$	**$93.32**	=	$0.18098	x	516				$53.04		Electricity		kWh		3412

		Occupied and Unoccupied		Rate/kWh		kWh saved
(3+4)	TOTAL COOLING COSTS	**$179.66**	=	$0.18098	x	992.7

5)	+/- Factor:	....	=	
6)	Combined Heating/Cooling Cost of Air Leakage (Savings):	....	=	**$1,268.63**
7)	Cost to Rectify Air Leakage:	....	=	**$3,280.00**
8)	Payback: Item 7/Item 6:	....	=	**2.59**

Payback = **2.6** **Years**

HOLE AREA "A" BASED UPON:

Single door - sweep & W/S: 6 doors x 20' perimeter x 1/8 in. crack	=	1.25 FT.^{2}
Double Doors, sweep & center W/S: 0 door sets x 13' perimeter x 1/16 in. crack	=	0.00 FT.^{2}
Single door - sweep only: 0 doors x 3' x 1/16 in. crack	=	0.00 FT.^{2}
Door, center only: 0 doors x 3' x 1/16 in. crack	=	0.00 FT.^{2}
Seal and W/S non-standard doors - 0 lineal feet x 1/16 in. crack	=	0.00 FT.^{2}
Overhead Doors (Sectional) W/S: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Overhead Doors (Roll-up) W/S: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Overhead Doors: 1 priced each	=	0.00 FT.^{2}
Window Glazing Exterior 0 lineal feet x 1/128in. crack	=	0.00 FT.^{2}
Window Glazing Interior 0 lineal feet x 1/128 in. crack	=	0.00 FT.^{2}
Window W/S - standard: 0 lineal ft x 1/32 in. crack	=	0.00 FT.^{2}
Window W/S - Cast-in-place: 0 lineal ft x 1/32 in. crack	=	0.00 FT.^{2}
Skylight seal 0 lineal feet x 1/64 in crack	=	0.00 FT.^{2}
Seal 68 lineal feet window frame-to-wall x 1/64 in. crack	=	0.09 FT.^{2}
Seal Ext. Remove & Replace 0 lineal ft x 1/64 in. crack	=	0.00 FT.^{2}
Roof-Wall Joint 1 line 0 lineal feet x 1/16 in.crack	=	0.00 FT.^{2}
Roof-Wall Joint 2 line 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Roof-Wall Joint 3 line 0 lineal feet x 3/16 in.crack	=	0.00 FT.^{2}
Soffits - low/easy: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Soffits - high/hard: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Drop Soffits: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
0 Roof Top Fans x 10' perimeter x 1/8 in. crack	=	0.00 FT.^{2}
RTUs/AHUs 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Seal Open-Topped Walls 0 lineal feet x 1/16 in.crack	=	0.00 FT.^{2}
Sealing Top Plates 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Duct/Fan Boot Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Duct/Fan Boot Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Recessed Lights: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Electrical Boxes: 1 lineal ft x 1/8 in. crack	=	0.08 FT.^{2}
Pipe Penetrations: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}

Wire Penetrations: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Plumbing/ Duct Penetration Type 1: 1 lineal ft x 1/8 in. crack	=	0.01 FT.^{2}
Plumbing/ Duct Penetration Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Flue/Chimney Penetration Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Flue/Chimney Penetration Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Penetrations: 1	=	0.20 FT.^{2}
Penetrations: 1	=	0.20 FT.^{2}
Boiler Rooms: 1 rooms at combo price	=	0.00 FT.^{2}
Seal around TTW A/C and fan coil unit 1 at 70 lineal feet at 1/6 in crack	=	0.97 FT.^{2}
Repair attic hatch framing and install new hatch panel 1 at 10 lineal feet at 1/8 in crack	=	0.10 FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00 FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00 FT.^{2}
TOTAL:	=	2.91 FT.^{2}

Conductive Measures

Measure:
Assumptions:

One						
U value Pre =	0.00000	Area - Sq. Ft. =	0	Payback in Years =	#DIV/0!	
U Value Post =	0.00000	Cost of retrofit =				

Heating				Cooling				Total Annual	
Heating System Efficiency		70%		Cooling System Efficiency		100%			
Fuel cost MMBtu - heating		$22.6005		Fuel cost MMBtu - cooling		$53.0409			
Occupied		Unoccupied		Occupied		Unoccupied			
Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pr	$0.00
Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pc	$0.00
Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Sa	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00

Total	
Annual $ Conductive Savings - heating	$ -
Annual $ Conductive Savings - cooling	$ -
Annual $ Conductive Savings - Total	$ -
Payback in years	#DIV/0!

Measure:
Assumptions:

Two						
U value Pre =	0.00000	Area - Sq. Ft. =	0	Payback in Years =	#DIV/0!	
U Value Post =	0.00000	Cost of retrofit =				

Heating				Cooling				Total Annual	
Heating System Efficiency		70%		Cooling System Efficiency		100%			
Fuel cost MMBtu - heating		$22.6005		Fuel cost MMBtu - cooling		$53.0409			
Occupied		Unoccupied		Occupied		Unoccupied			
Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pr	$0.00
Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pc	$0.00
Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Sa	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00

Total	
Annual $ Conductive Savings - heating	$ -
Annual $ Conductive Savings - cooling	$ -
Annual $ Conductive Savings - Total	$ -
Payback in years	#DIV/0!

Measure:
Assumptions:

Three						
U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!	
U Value Post =		Cost of retrofit =				

Heating				Cooling				Total Annual	
Heating System Efficiency		70%		Cooling System Efficiency		100%			
Fuel cost MMBtu - heating		$22.6005		Fuel cost MMBtu - cooling		$53.0409			
Occupied		Unoccupied		Occupied		Unoccupied			
Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pr	$0.00
Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pc	$0.00

	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Sa	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Four	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		70%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$22.6005		Fuel cost MMBtu - cooling		$53.0409			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pr	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Po	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Sa	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Five	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		70%		Cooling System Efficiency		0%			
	Fuel cost MMBtu - heating		$22.6005		Fuel cost MMBtu - cooling		$53.0409			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pr	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Po	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Sa	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Exhibit D5-4A.5
Robbinsville School District
ECM 4 - Building Envelope and Insulation Improvements
Building Envelope Improvements Sharon ES

Heating Savings

		CFM_{ho}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Heating Setpoint - Occupied		Avg Outdoor Air Temp During Heating Occ Bins		Wind Coefficient (C_W)		Avg Wind Velocity $(V)^2$
1)	Q_{ho}	2,062	=	31.04	x	144	x	50%	x	0.01500	x	72	-	42.3	+	0.00650	x	62.41

Heating Occupied	Occupied Heating Therms		Constant (Rho)		Q Heating Occupied		Heating Setpoint - Occupied		Avg Outdoor Air Temp Heat during Heat Occ Bins		% of Hrs/wk Actual Bldg Occupancy		Heating Season Bin Hours - Occupied		BTUs/Unit		Efficiency Of Heating System
Consumption Therms	1,553.77	=	1.08	x	2,062	x	72	-	42.3	x	35.71%	x	4933	÷	100,000	÷	75.0%

	Occupied Heating $		Occupied Heating Therms		Fuel Cost Per Unit	Cost/MMBtu	Fuel Type	Fuel Unit
$COST_{ho}$	$1,042.52	=	1,553.77	x	$0.67096	$6.71	Natural Gas	Therms

		CFM_{hu}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Heating Setpoint - Unoccupied		Avg Outdoor Air Temp During Heating Unocc Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
2)	Q_{hu}	1,986	=	31.04	x	144	x	50%	x	0.01500	x	67	-	41.4	+	0.00650	x	62.41

Heating Unoccupied	Unoccupied Heating Therms		Constant (Rho)		Q Heating Unoccupied		Heating Setpoint - Unoccupied		Avg Outdoor Air Temp Heat during Heat Unocc Bins		% of Hrs/wk Actual Bldg Setback		Heating Season Bin Hours - Unoccupied		BTUs/Unit		Efficiency Of Heating System
Consumption Therms	2,172.21	=	1.08	x	1,986	x	67	-	42.3	x	64.29%	x	4783	÷	100,000	÷	75.0%

	Unoccupied Heating $		Unoccupied Heating Therms		Fuel Cost Per Unit	Cost/MMBtu	Fuel Type	Fuel Unit
$COST_{hu}$	$1,457.47	=	2,172.21	x	$0.67096	$6.71	Natural Gas	Therms

		Occupied and Unoccupied Heating $		Fuel Cost		Occupied & Unoccupied Heating Therms
(1+2)	**TOTAL HEATING COSTS**	$2,499.98	=	$0.67096	x	3,725.98

CoolingSavings

		CFM_{co}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Cooling Setpoint - Occupied		Avg Outdoor Air Temp During Cooling Occ Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
3)	Q_{co}	1,607	=	31.04	x	144	x	50%	x	0.01500	x	73	-	80.4	+	0.00650	x	62.41

Cooling Occupied	Ton-Hours		Heat Factor Constant (Ct)		Q Cooling Occupied		Avg Outdoor Air Enthalpy Cooling Occ Bins		Cooling Supply air Enthalpy		% of Hrs/wk Actual Bldg Occupancy		Cooling Season Bin Hours - Occupied		% of Facility that is Cooled		Btu/hrs per Ton of Cooling
Consumption (ton hours)	3,503.5	=	4.5	x	1,607	x	34	-	22.7	x	35.71%	x	1601	÷	90%	÷	12000

	Occupied Cooling kWh		Ton-Hours		kW/ton		kW of Support Equip
Consumption (kWh)	4,204	=	3,503	x	1.20	+	

	Occupied Cooling $		Rate/kWh		kWh saved	Cost/MMBtu	Fuel Type	Fuel Unit	Btus/Unit
$COST_{cu}$	$592.28	=	$0.14088	x	4,204	$41.29	Electricity	kWh	3412

		CFM_{cu}		Existing Crack Area In Sq Ft		Conversion Factor		Infiltration to Exfiltration		Stack Coefficient (C_s)		Cooling Setpoint - Unoccupied		Avg Outdoor Air Temp During Cooling Unocc Bins		Wind Coefficient (C_W)		Avg Wind Velocity (V^2)
4)	Q_{cu}	1,571	=	31.04	x	144	x	50%	x	0.01500	x	78	-	83.9	+	0.00650	x	62.41

Cooling Unoccupied	Ton-Hours		Heat Factor Constant (Ct)		Q Cooling Unoccupied		Avg Outdoor Air Enthalpy Cooling UnOcc Bins		Cooling Supply air Enthalpy		% of Hrs/wk Actual Bldg Setback		Cooling Season Bin Hours - Unoccupied		% of Facility that is Cooled		Btu/hrs per Ton of Cooling
Consumption (ton hours)	3,817.5	=	4.5	x	1,571	x	34	-	22.7	x	64.29%	x	991	÷	90%	÷	12000

	Unoccupied Cooling kWh		Ton-Hours		kW/ton		kW of Support Equip
Consumption (kWh)	4,581	=	3,818	x	1.20	+	

	Unoccupied Cooling $		Rate/kWh		kWh saved	Cost/MMBtu	Fuel Type	Fuel Unit	Btus/Unit
$COST_{cu}$	$645.38	=	$0.14088	x	4,581	$41.29	Electricity	kWh	3412

		Occupied and Unoccupied		Rate/kWh		kWh saved
(3+4)	TOTAL COOLING COSTS	$1,237.66	=	$0.14088	x	8,785.2

5) +/- Factor: .... =

6) Combined Heating/Cooling Cost of Air Leakage (Savings): .... = $3,737.64

7)	Cost to Rectify Air Leakage:	....	=	$73,997.00
8)	Payback: Item 7/Item 6:	....	=	19.80

Payback = 19.8 Years

HOLE AREA "A" BASED UPON:

Single door - sweep & W/S: 37 doors x 20' perimeter x 1/16 in. crack	=	3.85 FT.^{2}
Double Doors, sweep & center W/S: 0 door sets x 13' perimeter x 1/16 in. crack	=	0.00 FT.^{2}
Single door - sweep only: 4 doors x 3' x 1/16 in. crack	=	0.06 FT.^{2}
Door, center only: 0 doors x 3' x 1/16 in. crack	=	0.00 FT.^{2}
Seal and W/S non-standard doors - 0 lineal feet x 1/16 in. crack	=	0.00 FT.^{2}
Overhead Doors (Sectional) W/S: 76 lineal ft x 1/8 in. crack	=	0.79 FT.^{2}
Overhead Doors (Roll-up) W/S: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Overhead Doors: 1 priced each	=	0.00 FT.^{2}
Window Glazing Exterior 0 lineal feet x 1/128in. crack	=	0.00 FT.^{2}
Window Glazing Interior 0 lineal feet x 1/128 in. crack	=	0.00 FT.^{2}
Window W/S - standard: 0 lineal ft x 1/32 in. crack	=	0.00 FT.^{2}
Window W/S - Cast-in-place: 0 lineal ft x 1/32 in. crack	=	0.00 FT.^{2}
Skylight seal 0 lineal feet x 1/64 in crack	=	0.00 FT.^{2}
Seal 54 lineal feet Air Conditioners x 1/16 in. crack	=	0.28 FT.^{2}
Seal Ext. Remove & Replace 0 lineal ft x 1/64 in. crack	=	0.00 FT.^{2}
Roof-Wall Joint 1 line 1700 lineal feet x 1/16 in.crack	=	8.85 FT.^{2}
Roof-Wall Joint 2 line 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Roof-Wall Joint 3 line 0 lineal feet x 3/16 in.crack	=	0.00 FT.^{2}
Soffits - low/easy: 476 lineal ft x 1/8 in. crack	=	4.96 FT.^{2}
Soffits - high/hard: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Drop Soffits: 0 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
48 Roof Top Fans x 10' perimeter x 1/8 in. crack	=	5.00 FT.^{2}
RTUs/AHUs 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Seal Open-Topped Walls 0 lineal feet x 1/16 in.crack	=	0.00 FT.^{2}
Sealing Top Plates 0 lineal feet x 1/8 in.crack	=	0.00 FT.^{2}
Duct/Fan Boot Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Duct/Fan Boot Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Recessed Lights: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Electrical Boxes: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Pipe Penetrations: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Wire Penetrations: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Plumbing/ Duct Penetration Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Plumbing/ Duct Penetration Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Flue/Chimney Penetration Type 1: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Flue/Chimney Penetration Type 2: 1 lineal ft x 1/8 in. crack	=	0.00 FT.^{2}
Penetrations: 0	=	0.00 FT.^{2}
Penetrations: 1	=	0.00 FT.^{2}
Boiler Rooms: 1 rooms at combo price	=	0.00 FT.^{2}
Roof/Wall Joint - 1 line 1 at 1160 lineal feet at 1/16 in crack	=	6.04 FT.^{2}
Seal shut old make-up air vents on exterior walls 0 at 130 lineal feet at na in crack	=	1.20 FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00 FT.^{2}
Custom 0 at 0 lineal feet at 0 in crack	=	0.00 FT.^{2}
TOTAL:	=	31.04 FT.^{2}

Conductive Measures

Measure:										
Assumptions:										
One	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$6.7096		Fuel cost MMBtu - cooling		$41.2895			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00
			Total							
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Two	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$6.7096		Fuel cost MMBtu - cooling		$41.2895			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00
			Total							
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							

	Payback in years	#DIV/0!

Measure:										
Assumptions:										
Three	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$6.7096		Fuel cost MMBtu - cooling		$41.2895			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Four	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		100%			
	Fuel cost MMBtu - heating		$6.7096		Fuel cost MMBtu - cooling		$41.2895			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Measure:										
Assumptions:										
Five	U value Pre =		Area - Sq. Ft. =		Payback in Years =	#DIV/0!				
	U Value Post =		Cost of retrofit =							
	Heating				Cooling				Total Annual	
	Heating System Efficiency		75%		Cooling System Efficiency		0%			
	Fuel cost MMBtu - heating		$6.7096		Fuel cost MMBtu - cooling		$41.2895			
	Occupied		Unoccupied		Occupied		Unoccupied			
	Bin Hours	4933	Bin Hours	4783	Bin Hours	1601	Bin Hours	991		
	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00	Measure $ Loss - Pre	$0.00
	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Post	$0.00	Measure $ Loss - Pos	$0.00
	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $ Savings	$0.00	Annual Conductive $	$0.00
	Total									
	Annual $ Conductive Savings - heating		$ -							
	Annual $ Conductive Savings - cooling		$ -							
	Annual $ Conductive Savings - Total		$ -							
	Payback in years	#DIV/0!								

Exhibit D5-4B.1
Robbinsville School District
ECM4B - Roof Replacements
Building Envelope Improvements

ECM Description:
Roof Replacement
Summary of Annual Energy Savings:
kWh 16,673
Therms 12,114
Assumptions, Clarifications, Deletions:
Building Existing Roof is in satisfactory condition and can be overlayed with little or no repairs
Assume Pond MS RTU Cooling Units have Average EER of 11.0
EPDM Single-ply Assumptions
-15%+ loss in thermal resistance due to thermal shorts of steel fasteners
-10% increase in thermal transmittance when using single layer of insulation boarc
-R-value & Air permeability of a deck, insulation & membrane has a major impact on System R-value

Calculation Formulas
Heating Savings = 1/(R Value of New Roof - R Value of Existing Roof) x Heating Hours Winter
Cooling Savings = 1/(R Value of New Roof - R Value of Existing Roof) x Cooling Hours Summer
Measurement & Verification:
OPTION A Stipulated Savings - Electric
OPTION C - Utility Bill Analysis. - Thermal
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

		Pond MS		Total	
C1	**Electrical Cost**	$0.15			
C2	**Fuel Cost**	$1.12			
C3	**Roof Area**	156,285			
C4	**Electical Savings**	17,013		**17,013**	kWh
C5	**Electical Savings $$**	$2,519		**$2,519**	
C6	**Diversity Factor**	100%			
C7	**Therm Savings**	12,619		**12,619**	Therms
C8	**Therm Savings $$**	$14,150		**$14,150**	
C9					
C10	**De-Rate Electric**	2%			
C11	**De-Rate Mechanical**	4%			
C12	**Electical Savings**	16,673		**16,673**	kWh
C13	**Electical Savings $$**	$2,469		**$2,469**	
C14	**Therm Savings**	12,114		**12,114**	Therms
C15	**Therm Savings $$**	$13,867		**$13,867**	

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	16,673	kwh/yr	0.000592	Tons/kwh	1.6	Tons CO2/yr	0.3	0.2
Natural Gas	1,211	mmbtu/yr	0.058500	Tons/mmBtu	12.9	Tons CO2/yr	2.3	1.4
#2 Fuel Oil		mmbtu/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**14.5**		**2.5**	**1.5**

Police and Water Departments								UAdT	UAdT					
Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Roof Square Feet	Cooling Gain and Heating Loss Btu's Existing	Cooling and Heating Gain Btu's Proposed	Cooling and Heating Gain Savings Btu's	cooling ton-hrs or heating therms saved	Chiller Eff - kw/ton, boiler efficiency	input kwh saved	Input therms saved
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**
Cooling														
95-100	97.5	72.6	0	5	1	6	156,285	4,785,274	1,836,348.75	2,948,925	246	1.09	268.1	
90-95	92.5	74.1	0	33	7	40	156,285	25,114,202	9,637,575.00	15,476,627	1290	1.09	1407.0	
85-90	87.5	71.8	0	92	30	122	156,285	55,896,068	21,450,116.25	34,445,952	2870	1.09	3131.5	
80-85	82.5	69.4	8	330	162	500	156,285	144,236,971	55,350,937.50	88,886,033	7407	1.09	8080.5	
75-80	77.5	67.4	98	257	265	620	156,285	73,645,700	28,261,537.50	45,384,163	3782	1.09	4125.8	
Heating														

50-55	52.5	46.3	218	223	289	730	156,285	483,109,007	185,393,081	297,715,925	2,977	70%		4,253
45-50	47.5	41.5	243	196	195	634	156,285	(570,194,199)	(218,812,024)	(351,382,175)	(29,282)	70%		944
40-45	42.5	38.0	193	171	149	513	156,285	(548,422,901)	(210,457,288)	(337,965,613)	(28,164)	70%		933
35-40	37.5	33.9	357	311	355	1023	156,285	(1,267,232,086)	(486,300,313)	(780,931,773)	(65,078)	70%		2,199
30-35	32.5	29.3	277	221	236	734	156,285	(1,033,788,792)	(396,716,449)	(637,072,343)	(53,089)	70%		1,821
25-30	27.5	24.6	159	98	134	391	156,285	(617,045,761)	(236,791,311)	(380,254,450)	(31,688)	70%		1,099
20-25	22.5	19.4	89	48	58	195	156,285	(340,823,477)	(130,791,009)	(210,032,468)	(17,503)	70%		613
15-20	17.5	15.4	74	20	31	125	156,285	(239,687,907)	(91,980,234)	(147,707,673)	(12,309)	70%		434
10-15	12.5	9.8	35	7	5	47	156,285	(98,098,109)	(37,645,149)	(60,452,960)	(5,038)	70%		179
5-10	7.5	4.1	17	9	8	34	156,285	(76,734,068)	(29,446,699)	(47,287,370)	(3,941)	70%		141
0-5	2.5	1.3	1	0	0	1	156,285	(2,426,575)	(931,198)	(1,495,377)	(125)	70%		4
-5-0	-2.5	0.0	0	0	0	0	156,285	-	-	-	-	70%		-
						5,715							17,013	12,619

Col.	Notes				
A-F	Weather Data for Newark, NJ				
				Inputs	
G	Total Bin Hours	5,715			
H	Roof Square Footage from Audit	156,285		Roof Square Feet Audited	156,285 sq.ft
I	Cooling Gain and Heating Loss mmBtu's Existing			C of Existing Roof (Winter)	0.2172 btu/sf hr deg F
				C of Existing Roof (Summer)	0.2192 btu/sf hr deg F
J	Cooling and Heating Gain mmBtu's Proposed			C of Proposed Roof (Winter)	0.0833 btu/sf hr deg F
				C of Proposed Roof (Summer)	0.0833 btu/sf hr deg F
K	Cooling and Heating Gain Savings mmBtu's			Winter Inside Set Point	72 Deg F
M	Cooling Ton-hrs or heating therms saved			Summer Inside Set Point	74 Deg F
N	Chiller/boiler efficiency	1.0909091	70%	Heating cost	$1.12 $/therm
O	Input kwh saved	17,013		Cooling cost	$0.15 $/kwh
P	Input therms saved	12,619		Cost savings	$16,669.08

Proposed SPF Roof

COMPONENT		Winter R-VALUE	Summer R-VALUE
2" Polyurathane Foam		12	12
Steel Deck		0	0
Sub-Total		**12**	**12**
Themal Shorts due to Steel Fasteners	0%	0	0
Thermal Transmittance Increase (0%)	0%	0	0
Air Permeability Factor of Deck. Insulation, membrane	0%	0	0
TOTAL R -Value		**12.00**	**12.00**

Existing Roof

COMPONENT		Winter R-VALUE	Summer R-VALUE
Inside Air Film		0.92	0.92
Steel Deck		0	0
2" Polyisocyanurate		16	16
¾" Perlite (2.78 * 0.75)		1.09	1.09
Smooth Built-Up Roof		0.24	0.24
Outside Air Film in Winter		0.17	0
Sub-Total		**18.42**	**18.25**
Themal Shorts due to Steel Fasteners	-15%	-2.763	-2.7375
Thermal Transmittance Increase (0%)	-10%	-1.842	-1.825
Air permability Factor of Deck. Insulation, membrane	-50%	-9.21	-9.125
TOTAL R -Value		**4.605**	**4.5625**

Exhibit D5-4C.1
Robbinsville School District
ECM4C - Window Replacements
Building Envelope Improvements

ECM Description:
Window Replacement
Summary of Annual Energy Savings:
kWh 343
Therms 1,561
Assumptions, Clarifications, Deletions:
Assume existing U-Factor of Windows is 1.3 btu/sq.ft/deg F
Calculation Formulas
Heating Savings = 1/(R Value of New Window - R Value of Existing Window) x Heating Hours Winter
Cooling Savings = 1/(R Value of New Window - R Value of Existing Window) x Cooling Hours Summer
Measurement & Verification:
OPTION A Stipulated Savings - Electric
OPTION C - Utility Bill Analysis. - Thermal
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

	Sharon		Total	
Electrical Cost	$ 0.1468			
Fuel Cost	$0.96			
Electical Savings	357		357	kWh
Electical Savings $$	$ 52		$ 52	
Therm Savings	1,697		1,697	Therms
Therm Savings $$	$ 1,627		$ 1,627	
De-Rate Electric	4%			
De-Rate Mechanical	8%			
Electical Savings	343		343	kWh
Electical Savings $$	$ 50		$ 50	
Therm Savings	1,561		1,561	Therms
Therm Savings $$	$ 1,497		$ 1,497	

Hamilton								UAdT	UAdT							
Amb. Temp Bin deg. F	Ave Temp deg. F	M.C.W.B deg. F	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Diversity Factor	Total Bin Hours	Window Square Feet	Cooling Gain and Heating Loss mmBtu's Existing	Cooling and Heating Gain mmBtu's Proposed	Cooling and Heating Gain Savings mmBtu's	cooling ton-hrs or heating therms saved	Chiller Eff - kw/ton, boiler efficiency	input kwh saved	Input therms saved
A	**B**	**C**	**D**	**E**	**F**			**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**
Cooling																
95-100	97.5	76.3	0	3	0	3	65%	2	981	0.06	0.02	0.04	3	0.86	2.9	
90-95	92.5	74.0	0	42	10	52	65%	34	981	0.80	0.25	0.55	46	0.86	39.5	
85-90	87.5	72.0	0	80	24	104	65%	68	981	1.16	0.36	0.81	67	0.86	57.6	
80-85	82.5	69.3	11	338	128	477	65%	310	981	3.36	1.03	2.33	194	0.86	166.3	
75-80	77.5	67.5	102	305	249	656	65%	426	981	1.90	0.59	1.32	110	0.86	94.2	
Heating																
50-55	52.5	47.0	217	191	192	600	65%	390	981	10.70	3.29	7.41	74	65%		113.9

45-50	47.5	42.2	218	223	289	730	65%	475	981	16.04	4.94	11.11	111	65%		170.9
40-45	42.5	37.9	243	196	195	634	65%	412	981	16.56	5.10	11.47	115	65%		176.4
35-40	37.5	33.6	193	171	149	513	65%	333	981	15.53	4.78	10.75	108	65%		165.4
30-35	32.5	29.4	357	311	355	1,023	65%	665	981	35.21	10.83	24.37	244	65%		375.0
25-30	27.5	24.8	277	221	236	734	65%	477	981	28.30	8.71	19.60	196	65%		301.5
20-25	22.5	20.4	159	98	134	391	65%	254	981	16.70	5.14	11.56	116	65%		177.9
15-20	17.5	15.4	89	48	58	195	65%	127	981	9.14	2.81	6.33	63	65%		97.3
10-15	12.5	10.0	74	20	31	125	65%	81	981	6.38	1.96	4.41	44	65%		67.9
5-10	5.5	6.2	35	7	5	47	65%	31	981	2.67	0.82	1.85	18	65%		28.4
0-5	2.5	0.6	17	9	8	34	65%	22	981	2.02	0.62	1.40	14	65%		21.5
-5-0	-2.5	-3.1	1	0	0	1	65%	1	981	0.06	0.02	0	0	65%		0.7
								4105							357	1,697

Col.	Notes			
A-F	Weather Data for Trenton, from Normal Engineering Weather Data for U.S. Cities			
			Inputs	
G	Total Bin Hours	4105	Diversity Factor	65%
H	Window Square Footage from Audit	981	Window Square Feet Audited	981 sq.ft
I	Cooling Gain and Heating Loss mmBtu's Existing		U of Existing Window	1.30 btu/sq.ft/deg F
J	Cooling and Heating Gain mmBtu's Proposed		U of Proposed Window	0.40 btu/sq.ft/deg F
K	Cooling and Heating Gain Savings mmBtu's		Winter Inside Set Point	72 Deg F
M	Cooling Ton-hrs or heating therms saved		Summer Inside Set Point	74 Deg F
N	Chiller/boiler efficiency		Heating cost	$1.00 $/therm
O	Input kwhsaved	357	Cooling cost	$0.14 $/kwh
P	Input therms saved	1696.7	Cost savings	$1,747

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	343	kwh/yr	0.000592	Tons/kwh	0.2	Tons CO2/yr	0.0	0.0
Natural Gas	156	mmbtu/yr	0.058500	Tons/mmBtu	9.1	Tons CO2/yr	1.6	1.0
#2 Fuel Oil	-	mmbtu/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**9.3**		**1.6**	**1.0**

Exhibit D5-4C.2
Robbinsville School District
ECM4C - Window Replacements
Building Envelope Improvements

Window Summary

	Window	Height (in)	Width (in)	Area (ft2)	
1	1	70.0	37.0	18.0	East Front Office
2	2	70.0	37.0	18.0	East Front Office
3	3	70.0	37.0	18.0	East Front Office
4	4	70.0	37.0	18.0	East Front Office
1	5	45.0	42.0	13.1	North Front Office
2	6	45.0	42.0	13.1	North Front Office
3	7	45.0	42.0	13.1	North Front Office
4	8	45.0	42.0	13.1	North Front Office
1	9	45.0	33.5	10.5	North Front Office
1	10	69.0	40.5	19.4	North Front Office
2	11	69.0	40.5	19.4	North Front Office
3	12	69.0	40.5	19.4	North Front Office
4	13	69.0	40.5	19.4	North Front Office
5	14	69.0	40.5	19.4	North Front Office
1	15	40.5	37.0	10.4	North Front Class Room
2	16	40.5	37.0	10.4	North Front Class Room
3	17	40.5	37.0	10.4	North Front Class Room
4	18	40.5	37.0	10.4	North Front Class Room
5	19	40.5	37.0	10.4	North Front Class Room
6	20	40.5	37.0	10.4	North Front Class Room
7	21	40.5	37.0	10.4	North Front Class Room
8	22	40.5	37.0	10.4	North Front Class Room
9	23	40.5	37.0	10.4	North Front Class Room
10	24	40.5	37.0	10.4	North Front Class Room
11	25	40.5	37.0	10.4	North Front Class Room
12	26	40.5	37.0	10.4	North Front Class Room
13	27	40.5	37.0	10.4	North Front Class Room
14	28	40.5	37.0	10.4	North Front Class Room
15	29	40.5	37.0	10.4	North Front Class Room
16	30	40.5	37.0	10.4	North Front Class Room
17	31	40.5	37.0	10.4	North Front Class Room
18	32	40.5	37.0	10.4	North Front Class Room
19	33	40.5	37.0	10.4	North Front Class Room
20	34	40.5	37.0	10.4	North Front Class Room
21	35	40.5	37.0	10.4	North Front Class Room
22	36	40.5	37.0	10.4	North Front Class Room
23	37	40.5	37.0	10.4	North Front Class Room
24	38	40.5	37.0	10.4	North Front Class Room
1	39	52.5	41.5	15.1	North West Front Class Room - Classroom Addition
2	40	52.5	41.5	15.1	North West Front Class Room - Classroom Addition
3	41	52.5	41.5	15.1	North West Front Class Room - Classroom Addition

4	42	52.5	41.5	15.1	North West Front Class Room - Classroom Addition
5	43	52.5	41.5	15.1	North West Front Class Room - Classroom Addition
6	44	52.5	41.5	15.1	North West Front Class Room - Classroom Addition
1	45	52.5	41.5	15.1	South West Rear Class Room - Classroom Addition
2	46	52.5	41.5	15.1	South West Rear Class Room - Classroom Addition
3	47	52.5	41.5	15.1	South West Rear Class Room - Classroom Addition
4	48	52.5	41.5	15.1	South West Rear Class Room - Classroom Addition
5	49	52.5	41.5	15.1	South West Rear Class Room - Classroom Addition
6	50	52.5	41.5	15.1	South West Rear Class Room - Classroom Addition
1	51	40.5	37.0	10.4	South West Rear Class Room
2	52	40.5	37.0	10.4	South West Rear Class Room
3	53	40.5	37.0	10.4	South West Rear Class Room
4	54	40.5	37.0	10.4	South West Rear Class Room
5	55	40.5	37.0	10.4	South West Rear Class Room
6	56	40.5	37.0	10.4	South West Rear Class Room
7	57	40.5	37.0	10.4	South West Rear Class Room
8	58	40.5	37.0	10.4	South West Rear Class Room
9	59	40.5	37.0	10.4	South West Rear Class Room
10	60	40.5	37.0	10.4	South West Rear Class Room
11	61	40.5	37.0	10.4	South West Rear Class Room
12	62	40.5	37.0	10.4	South West Rear Class Room
13	63	40.5	37.0	10.4	South West Rear Class Room
1	64	43.0	37.0	11.0	South Rear - Newer Window with Insulation
2	65	43.0	37.0	11.0	South Rear - Newer Window with Insulation
3	66	43.0	37.0	11.0	South Rear - Newer Window with Insulation
4	67	43.0	37.0	11.0	South Rear - Newer Window with Insulation
1	68	35.3	37.0	9.1	South East Rear Class Room
2	69	35.3	37.0	9.1	South East Rear Class Room
3	70	35.3	37.0	9.1	South East Rear Class Room
4	71	35.3	37.0	9.1	South East Rear Class Room
5	72	35.3	37.0	9.1	South East Rear Class Room
6	73	35.3	37.0	9.1	South East Rear Class Room
7	74	35.3	37.0	9.1	South East Rear Class Room
8	75	35.3	37.0	9.1	South East Rear Class Room
9	76	35.3	37.0	9.1	South East Rear Class Room
10	77	35.3	37.0	9.1	South East Rear Class Room
11	78	35.3	37.0	9.1	South East Rear Class Room
12	79	35.3	37.0	9.1	South East Rear Class Room
13	80	35.3	37.0	9.1	South East Rear Class Room

Exhibit D5-4C.1
Robbinsville School District
ECM4D - Door Replacements
Building Envelope Improvements

ECM Description:
Door Replacement
Summary of Annual Energy Savings:
kWh 887
Therms 852
Assumptions, Clarifications, Deletions:
Assume existing Doors have a surface crack area of .20 square feet
Calculation Formulas
Heating Savings = Flow Factor x Pressure Diff. x Crack Area x HDD/ Heating Eff. Factor / 100,000
Measurement & Verification:
OPTION C - Utility Bill Analysis. - Thermal
Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

	Sharon Doors	Totals	
OCCUPIED HOURS / YEAR =	4,105		HRS / YR
UNOCCUPIED HOURS / YR =	515		HRS / YR
AVERAGE WINTER OUTDOOR TEMPERATURE =	38		DEG F
OCCUPIED INDOOR TEMPERATURE =	70		DEG F
UNOCCUPIED INDOOR TEMPERATURE =	60		DEG F
AVERAGE BOILER EFFICENCY =	65%		%
FUEL COST =	1.000		$ / THERM
TOTAL CRACK AREA - SQ. FT.	2.5		
AIR LEAKAGE CFM	374		AIR LEAKAGE IN CFM * (FLOW FACTOR = 20) * ((AP)^N = 7.4) * CRACK AREA
OCCUPIED SAVINGS THERMS/YR	817		UNOCCUPIED ENERGY SAVINGS = CFM * 1.08 * UNOCCUPIED HRS/YR * (UNOCCUPIED TEMPERATURE - AVERAGE OUTDOOR TEMPERATURE) / 10^6 / Boiler EFF.
UNOCCUPIED SAVINGS THERMS/YR	70		OCCUPIED ENERGY SAVINGS = CFM * 1.08 * OCCUPIED HRS/YR * (OCCUPIED TEMPERATURE - AVERAGE OUTDOOR TEMPERATURE) / 10^6/ Boiler EFF.
ENERGY SAVINGS THERMS/YR	887	887	TOTAL ENERGY SAVINGS = OCCUPIED SAVINGS + UNOCCUPIED SAVINGS
COST SAVINGS $/YR	$887	$886.99	COST SAVINGS = TOTAL ENERGY SAVINGS $ / THERM
De-rate	4%		
GUARANTEED ENERGY SAVINGS	852	852	
GUARANTEED COST SAVINGS	$852	$851.51	

Sharon	No. of Doors	S.F.
North West Front Classroom Addition - L	1	0.20
North West Front Classroom Addition- R	1	0.20
West Front Classroom Addition - L	1	0.20
West Front Classroom Addition - R	1	0.20
South West Front Classroom Addition - L	1	0.20
South West Front Classroom Addition - R	1	0.20
Cafeteria - Single	1	0.21
Cafeteria - Double - L	1	0.21
Cafeteria - Double - R	1	0.21
Receiving Bay Door - L	1	0.35
Receiving Bay Door - R	1	0.36
TOTAL:		2.53

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	-	kwh/yr	0.00059190	Tons/kwh	0.0	Tons CO2/yr	-	0.0
Natural Gas	85.15	mmbtu/yr	0.05850000	Tons/mmBtu	5.0	Tons CO2/yr	0.870	0.5
Totals					**5.0**		**0.870**	**0.5**

Exhibit D5-4D.2
Robbinsville School District
ECM4C - Door Replacements
Building Envelope Improvements

Door Summary

Sharon Doors 0.125

	Door	Height (in)	Width (in)	Area (ft2)	Crack Area	
1	1	79.0	36.0	19.8	0.200	North West Front Classroom Addition - L
1	2	79.0	36.0	19.8	0.200	North West Front Classroom Addition- R
1	3	79.0	36.0	19.8	0.200	West Front Classroom Addition - L
1	4	79.0	36.0	19.8	0.200	West Front Classroom Addition - R
1	5	79.0	36.0	19.8	0.200	South West Front Classroom Addition - L
1	6	79.0	36.0	19.8	0.200	South West Front Classroom Addition - R
1	7	83.0	36.0	20.8	0.207	Cafeteria - Single
1	8	83.0	36.0	20.8	0.207	Cafeteria - Double - L
1	9	83.0	36.0	20.8	0.207	Cafeteria - Double - R
1	10	108.0	95.0	71.3	0.352	Receiving Bay Door - L
1	11	108.0	98.0	73.5	0.358	Receiving Bay Door - R

Exhibit D5-5A.1
Robbinsville School District
ECM 5A Power Factor Optimization
Power Management

ECM Description:
Power Factor Optimization

Summary of Annual Energy Savings:
kW 34,800
Therms

Assumptions, Clarifications, Deletions:
Assume 2% increase in current power factor

Calculation Formulas
Power Factor = Real Power / Apparent Power
Apparent Power = Sqrt(Real Power^2 + Reactive Power^2)
Reactive Power = Non-working power caused by magnetizing current

Measurement & Verification:
OPTION A Stipulated Savings - Electric

Commissioning:
Third Party commissioning as per NJ ESIP

Data and Calculations:

		Robbinsville HS	Pond MS	Sharon ES		Total	
C1	Total Amp Service	4,000	2,000	800		6,800	
C2	KWH	2,578,800	1,505,300	816,259			
C3	Annual KW	5,658	4,886	3,051			
C4	Hours	456	308	268			
C5	Average kW	472	407	254			
C6	Load Factor	16%	28%	42%			
C7	Voltage	480	480	480			
C8	Current Amp Draw	640	560	336			
C9	pf	89%	88%	91%			
C10	Apparent Power KVA	531	465	279			
C11	Inductive Reactive Power	245	225	115			
C12	Assume 8% decrease in current draw	8%	8%	8%			
C13	New Current Draw Amps	589	515	309			
C14	New PF	96%	95%	99%			
C15	Cost per kWh	$0.14	$0.15	$0.15			
C16	kWh Savings	18,687	10,908	5,915		35,510	
C17	kWh Savings $$	2,683	1,615	868		$5,166	
C18	De-Rate	2%	2%	2%			
C19	kWh Savings	18,313	10,690	5,797		34,800	
C20	kWh Savings $$	$2,629	$1,583	$851		$5,063	

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	34,800	kwh/yr	0.0005919	Tons/kwh	20.5979133	Tons CO2/yr	3.60	2.17
Natural Gas		mmbtu/yr	0.0585	Tons/mmBtu	-	Tons CO2/yr	-	-
#2 Fuel Oil		mmbtu/yr	0.01119	Tons/gal	-	Tons CO2/yr	-	-
Totals					20.60		3.60	2.17

Exhibit G5-5B.1
Hanover Township Public Schools
ECM - 5B Install Energy Efficient Distribution Transformers

	Project Description	Robbinsville HS	Pond MS	Sharon ES		TOTAL	
C1	***Data Entry***	**12**	**12**	**2**		**26**	
C2	***Transformer KVA***	30	30	30			
C3	***Quantity***	1	3				
C4	***Transformer KVA***	45	45	45			
C5	***Quantity***		3				
C6	***Transformer KVA***	75	75	75			
C7	***Quantity***	7	4				
C8	***Transformer KVA***	112.5	112.5	112.5			
C9	***Quantity***	1					
C10	***Transformer KVA***	150	150	150			
C11	***Quantity***	2	1				
C12	***Transformer KVA***	300	300	300			
C13	***Quantity***	1		2			
C14	***Transformer KVA***	15	15	15			
C15	***Quantity***		1				
C16	**Total Electrical System kVA**	1267.5	690	600			C3*C2+C4*C5+C6*C7+C8*C9+C10*C11+C12*C13+C14*C15
C17	System Power Factor	0.80	0.80	0.80			
C18	Available Full Load kW (=kVA x PF)	1014	552	480			C16*C17
C19	equipment operating hrs/ day	12	12	12			
C20	equipment operating days/yr	365	365	365			
C21	Load during normal operating hours	10%	10%	8%			
C22	Load outside operating hours	5%	5%	3%			
C23	Calc Load kW Op Hours	101	55	38			C21*C18
C24	Calc Load kW Non-Op Hours	51	28	14			C22*C18
C25	Calc Annual kWh Op Hours	444,132	241,776	168,192			C23*C20*C19
C26	Calc Annual kWh Non Op Hours	222,066	120,888	63,072			C24*(24*365-C20*C19)
C27	Total Annual Load kWh:	666,198	362,664	231,264			C26+C25
C27A	Actual Load kWh	2,578,800	1,505,300	816,259			From Utility Summary
C27B	%of Actual Load	26%	24%	28%			Calc Load/Actual Load
C28	**Annual Cost to Operate Load Only**						
C29	kWh rate	$ 0.144	$ 0.148	$ 0.147			
C30	demand rate ($/kW/mo) ex. $10.00	$0.00	$0.00	$0.00			
C31	Annual ConsumptionCalculated:	$ 95,643	$ 53,706	$ 33,951			
C32	Annual Demand:	$ -	$ -	$ -			
C33	**Total Cost to run load**	**$ 95,643**	**$ 53,706**	**$ 33,951**			
C34	***Annual Cost of Status Quo Transformer Losses & Associated Air Conditioning (A/C) burden***						
C35	% Electronic Equipment (computers etc)	75.0%	75.0%	75.0%			
C36	Associated Loss Multiplier:	2.28	2.28	2.28			1+(1.7*C35)
C37	Status Quo Transformer Linear Efficiency	95.0%	95.0%	95.0%			
C38	Actual Efficiency due to electronic content	88.6%	88.6%	88.6%			1-((1-C37)*C36)
C39	Transformer kW Losses (Normal Operation)	13.0	7.1	4.9			(C23/(C38)-C23)
C40	Transformer kW Losses (Outside op. hrs)	6.5	3.5	1.8			(C24/(C38)-C24)
C41	Annual addititional kWh from transformers	85,506	46,548	29,683			C39*C19*C20+C40*(24*365-C19*C20)
C42	**Annual Cost of Transformer Losses**	$ 12,276	$ 6,893	$ 4,358			(C39*C29*C19*C20+12*C30*C39)+C40*(24*365-C19*C20)*C29
C43	A/C System Performance (kW/ton)	0.80	0.80	0.80			
C44	Additional Tons of Cooling	3.70	2.01	1.40			IF(C43>0,C39/3.52,0)
C45	Annual addititional kWh from A/C	19,433	10,579	6,746			C41*C43/3.52
C46	**Annual Cost of Associated A/C**	$ 2,790	$ 1,567	$ 990			C42*C43/3.52
C47	**Summary with Status Quo Transformer**						
C48	Annual Cost of feeding Building Load	$ 95,643	$ 53,706	$ 33,951			C33
C49	Annual Cost of Transformer Losses	$ 12,276	$ 6,893	$ 4,358			C42
C50	Annual Cost of Associated A/C	$ 2,790	$ 1,567	$ 990			C46
C51	**Electrical Bill (Status Quo Transformer)**	**$ 110,709**	**$ 62,166**	**$ 39,299**			
C52	***Premium Effficiency Transformer***						
C53	Actual Efficiency under electronic load	98.2%	98.2%	98.2%			
C54	Transformer kW Losses (Normal Operation)	1.9	1.0	0.7			(C23/(1-(1-C53))-C23)
C55	Transformer kW Losses (Outside op. hrs)	0.9	0.5	0.3			(C24/(1-(1-C53))-C24)
C56	Annual addititional kWh from transformers	12,211	6,648	4,239			C54*C19*C20+C55*(24*365-C19*C20)
C57	**Annual Cost of Powersmiths Losses**	$ 1,753	$ 984	$ 622			(C54*C29*C19*C20+12*C30*C54)+C55*(24*365-C19*C20)*C29
C58	Additional Tons of Cooling (on peak)	0.53	0.29	0.20			IF(C43>0,C54/3.52,0)
C59	Annual addititional kWh from A/C	2,775	1,511	963			C56*C43/3.52
C60	**Annual Cost of Associated A/C**	$ 398	$ 224	$ 141			C57*C43/3.52
C61							
C62	***Comparing Status Quo & PREMIUM Transformers***						
C63	**Status Quo**						
C64	Annual Cost of feeding Building Load	$ 95,643	$ 53,706	$ 33,951			C48
C65	Annual Cost of Transformer Losses	$ 12,276	$ 6,893	$ 4,358			C49
C67	Annual Cost of Associated A/C	$ 2,790	$ 1,567	$ 990			C50
C68	**Annual estimated Electrical Bill**	$ 110,709	$ 62,166	$ 39,299			
C69	**Premium Effficiency Transformer**						
C70	Annual Cost of feeding Building Load	$ 95,643	$ 53,706	$ 33,951			C33
C71	Annual Cost of Transformer Losses	$ 1,753	$ 984	$ 622			C57
C72	Annual Cost of Associated A/C	$ 398	$ 224	$ 141			C60
C73	**Annual estimated Electrical Bill**	$ 97,795	$ 54,915	$ 34,714			
C74	**Reduction**	12%	12%	12%			(C67-C72)/C67
C75	Annual kWh reduction	89,953	48,968	31,226		**170,148**	C27+C41+C45-C27-C56-C59
C76	Savings	$12,914	$7,252	$4,584		**$24,750**	C74*C29
C77	De-Rate	2%	2%	2%			4%
C78	Annual kWh reduction	88,153.90	47,989.11	30,601.75		**166,744.75**	C74*(1-C76)
C79	Savings	$12,656	$7,107	$4,492		**$24,255**	C75*(1-C76)

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	166,745	kwh/yr	0.000592	Tons/kwh	98.7	Tons CO2/yr	17.2	10.4
Natural Gas		mmbtu/yr	0.058500	Tons/mmBtu	0.0	Tons CO2/yr	-	0.0
#2 Fuel Oil	-	mmbtu/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**98.7**		**17.2**	**10.4**

Exhibit D5-5C.1
Robbinsville School District
ECM 5C Premium Eficiency Motors and VFDs
Mechanical

ECM Description:

Premium Eficiency Motors and VFDs

Summary of Annual Energy Savings:

kWh 27,274

Therms

Assumptions, Clarifications, Deletions:

ECM replaces Standard Efficiency Motors with Premium Efficiency Motors and Variable Frequency Drives (VFDs)

Assume motors are 50% Loaded

Assume Savings for new Motor is negligible

Assume four (4) sets of 3 hp motors in Sharon ES orginal will be replaced by new 10 hp motor

Calculation Formulas

Motor Savings = [Standard Motor(s) Hp x 0.746 x Load Factor x Hours of Operation] / Motor Efficiency -[Premium Eff. Motor Hp x 0.746 x Load Factor x Hours of Operation] / Motor Efficiency

VFD Savings = [Motor Hp x 0.746 x Load Factor x (1-VFD Pwr Reduction)^2.5 x Hours of Operation] / Motor Efficiency

Measurement & Verification:

OPTION A Stipulated Savings - Electric

Commissioning:

Third Party commissioning as per NJ ESIP

Data and Calculations:

	$/kWh	kWh Savings	kWh Savings $$	De-Rate	kWh Savings	kWh Savings $$
Pond Road MS	$0.1481	10068.1	$1,491	2%	9,867	$1,461
Sharon ES	$0.1468	17,763	$2,608	2%	17,407	$2,555
Total		**27,831**	**$4,099**		**27,274**	**$4,017**

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	27,274	kwh/yr	0.000592	Tons/kwh	16.1	Tons CO2/yr	2.8	1.7
Natural Gas	-	mmbtu/yr	0.058500	Tons/mmBtu	0.0	Tons CO2/yr	-	0.0
#2 Fuel Oil	-	mmbtu/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**16.1**		**2.8**	**1.7**

Pond Road MS
Motor Savings

VFD Savings

			A	B		C	D	E	F	G	H	I			
Item#	**BLDG.**	**EQUIPMENT DESCRIPTION**	**MOTOR SIZE (Hp)**	**MOTOR SIZE (kW)**	**MOTOR TYPE TEFC/ODP**	**OPERATING HOURS/YR**	**MOTOR LOAD**	**MOTOR EFFICIENCY**	**EXISTING kW**	**ASSUMED NEW SPEED**	**NEW kW**	**SAVED kWh**	HP		**HP**
				A*.746					**B*C/D**		**F*G^3**	**H*C**			
1	Pond Road MS	HHW Pump -1A	10	7.46	TEFC	1,873	50%	91.2%	4.09	70.0%	1.40	5,034	10		**10.00**
2	Pond Road MS	HHW Pump -2A	10	7.46	TEFC	1,873	50%	91.2%	4.09	70.0%	1.40	5,034	10		**10.00**
	TOTALS:		**20.00**									**10,068**			

VFD Savings

			A	B		C	D	E	F	G	H	I			
Item#	**BLDG.**	**EQUIPMENT DESCRIPTION**	**MOTOR SIZE (Hp)**	**MOTOR SIZE (kW)**	**MOTOR TYPE TEFC/ODP**	**OPERATING HOURS/YR**	**MOTOR LOAD**	**MOTOR EFFICENCY**	**EXISTING kW**	**ASSUMED NEW SPEED**	**NEW kW**	**SAVED kWh**	**HP**		**HP**
				A*.746				***NEMA***	**B*D/E**		**F*G^3**	**(F-H)*C**			
1	Sharon ES	HHW Pump1A	10	7.46	TEFC	1,873	50%	91.2%	4.09	70%	1.40	5,034	10		**10.00**
2	Sharon ES	HHW Pump 1B	10	7.46	TEFC	1,873	50%	91.2%	4.09	70%	1.40	5,034	10		**10.00**
3	Sharon ES	HHW Pump 2A	7.5	5.595	TEFC	1,873	50%	89.5%	3.13	70%	1.07	3,847	7.5		**7.50**
4	Sharon ES	HHW Pump 2B	7.5	5.595	TEFC	1,873	50%	89.5%	3.13	70%	1.07	3,847	7.5		**7.50**
												17,763			

Exhibit D5-6A.1
Robbinsville School District
ECM 6A Water Conservation
Water Conservation

ECM Description:

Water Conservation

Summary of Annual Energy Savings:

kGal	1,061
Therms	1,778

Assumptions, Clarifications, Deletions:

Water savings based on Water Bills only, Sewer Charged per Equivalent Dwelling Unit

Savings based on fixture upgrades resuling in decreased gal/flush and flow rate.

Calculation Formulas

Water Savings = Existing Water Usage - Proposed Water Usage

Thermal Savings = Flow Differnetial * 1.08 * Cp * (Water temperature - City Water temperature)

Measurement & Verification:

OPTION C - Utility Bill Analysis. - Water

OPTION C - Utility Bill Analysis. - Thermal

Commissioning:

Third Party commissioning as per NJ ESIP

Data and Calculations:

	School	Robbinsville HS	Pond MS	Windsor ES	Sharon ES		Total
C1	Building Type (1,2,3)	2	2	2	2		**2 = School**
C2	Average total occupancy (staff/day)	119	176	9	121		
C3	Average total students (shift change) (per day)	809	1117	50	820		
C4	days per week occupied	5	5	5	5		
C5	Existing Toilet GPF	1.61	1.61	1.80	1.86		
C6	Existing Urinal GPF	1.03	1.03	1.03	1.03		
C7	Existing Faucet Average GPM	1.26	1.36	1.49	1.47		
C8	Existing Shower GPM	2.50	2.50	0.00	2.50		
C9	Blended Rate ($/kgal)	$ 4.74	$ 4.74	$ 4.74	$ 4.74		
C10	Electric Blended Rate ($/kWh)	$0.144	$0.148	$0.179	$0.147		
C11	Gas Rate ($/therm)	$0.91	$1.12	$2.26	$0.96		
C12	Staff hours spent in bldg	10	8	6	8		
C13	Student hours spent in bldg	10	6	6	6		
C14	Reduced Usage factor	95%	65%	50%	90%		
C15	Proposed Toilet GPF	1.60	1.61	1.00	1.41		
C16	Proposed Urinal GPF	0.50	0.50	0.50	0.50		
C17	Proposed Faucet GPM	0.50	0.50	0.50	0.50		
C18	Proposed Shower GPM	1.75	2.46	0.00	2.13		
C19	Shower Reduced Usage Factor	5%	1%	0%	1%		
C20	DHW Source (E/G/O)	G	G	G	G		**Electric/Gas/Oil**
C21	Percent Hot Water	54%	54%	54%	54%		
C22	**Existing Estimate**						
C23	toilets						
C24	Shifts/year	325	204	195	203		
C25	people	882	840	30	847		
C26	uses/shift	2.0	2.0	2.0	2.0		
C27	gpm/gpf	1.6	1.6	1.8	1.9		
C28	Exisitng usage (gal/yr)	922,594	551,662	20,709	640,673		
C29	hw gal/year						
C30	Urinals						
C31	Shifts/year	325	204	195	203		
C32	people	441	420	15	423		
C33	uses/shift	2.0	2.0	2.0	2.0		
C34	gpm/gpf	1.0	1.0	1.0	1.0		
C35	Exisitng usage (gal/yr)	295,116	176,463	5,925	177,391		
C36	hw gal/year						
C37	Faucets						
C38	Shifts/year	325	204	195	203		
C39	people	882	840	30	847		
C40	uses/shift	1.0	1.0	1.0	1.0		
C41	gpm/gpf	1.3	1.4	1.5	1.5		
C42	Exisitng usage (gal/yr)	361,015	233,000	8,571	253,169		
C43	hw gal/year	194,948	125,820	4,628	136,711		
C44	Showers						
C45	Shifts/year	325	204	195	203		
C46	people	44	8	0	8		
C47	uses/shift	5.3	5.3	5.3	5.3		
C48	gpm/gpf	2.5	2.5	0.0	2.5		
C49	Exisitng usage (gal/yr)	189,820	22,700	-	22,820		
C50	hw gal/year	102,503	12,258	-	12,323		
C51	Calculated usage	1,768,545	983,827	35,205	1,094,053		
C52	Baseline Usage	1,800,000	1,012,000	35,000	1,055,900		
C53	**Proposed Estimate**						
C54	toilets						
C55	Shifts/year	325	204	195	203		
C56	people	882	840	30	847		
C57	uses/shift	2.0	2.0	2.0	2.0		
C58	gpm/gpf	1.6	1.6	1.0	1.4		
C59	Exisitng usage (gal/yr)	916,864	551,662	11,505	485,672		
C60	hw gal/year						
C61	Urinals						
C62	Shifts/year	325	204	195	203		
C63	people	441	420	15	423		
C64	uses/shift	2.0	2.0	2.0	2.0		
C65	gpm/gpf	0.5	0.5	0.5	0.5		
C66	Exisitng usage (gal/yr)	143,260	85,662	2,876	86,112		
C67	hw gal/year						
C68	Faucets						
C69	Shifts/year	325	204	195	203		
C70	people	882	840	30	847		
C71	uses/shift	1.0	1.0	1.0	1.0		
C72	gpm/gpf	0.5	0.5	0.5	0.5		

C73	Exisitng usage (gal/yr)	143,260	85,662	2,876	86,112		
C74	hw gal/year	77,360	46,257	1,553	46,500		
C75	Showers						
C76	Shifts/year	325	204	195	203		
C77	people	44	8	0	8		
C78	uses/shift	5.3	5.3	5.3	5.3		
C79	gpm/gpf	1.8	2.5	0.0	2.1		
C80	Exisitng usage (gal/yr)	132,874	22,337	-	19,442		
C81	hw gal/year	71,752	12,062	-	10,499		
C82	**Proposed Savings**						
C83	toilets						
C84	Estimated Savings (gal/yr)	5,730	-	9,204	155,002		
C85	Water Savings ($/yr)	$ 27.16	$ -	$ 43.63	$ 734.71		
C86	HW gal/year						
C87	Hot Water Savings (kWh/yr)						
C88	Hot Water Source						
C89	Hot Water Savings ($/yr)						
C90	Urinals						
C91	Estimated Savings (gal/yr)	151,856	90,802	3,049	91,279		
C92	Water Savings ($/yr)	$ 719.80	$ 430.40	$ 14.45	$ 432.66		
C93	HW gal/year						
C94	Hot Water Savings (kWh/yr)						
C95	Hot Water Source						
C96	Hot Water Savings ($/yr)						
C97	Faucets						
C98	Estimated Savings (gal/yr)	217,755	147,338	5,695	167,057		
C99	Water Savings ($/yr)	$ 1,032.16	$ 698.38	$ 26.99	$ 791.85		
C100	HW gal/year	117,588	79,563	3,075	90,211		
C101	Hot Water Savings (kWh/yr)						
C102	Hot Water Source	G	G	G	G		
C103	Hot Water Savings ($/yr)	$ 615.06	$ 511.14	$ 39.82	$ 495.71		
C104	Showers						
C105	Estimated Savings (gal/yr)	56,946	363	-	3,377		
C106	Water Savings ($/yr)	$ 269.92	$ 1.72	$ -	$ 16.01		
C107	HW gal/year	30,751	196	-	1,824		
C108	Hot Water Savings (kWh/yr)						
C109	Hot Water Source	G	G	G	G		
C110	Hot Water Savings ($/yr)	$ 160.85	$ 1.26	$ -	$ 10.02		
C111	**Total Savings**						
C112	Estimated Savings (Kgal/yr)	432	239	18	417		**1,105**
C113	Water Savings ($/yr)	$2,049	$1,131	$85	$1,975		**$5,240**
C114	HW Kgal/year	148,339	79,759	3,075	92,035		**323**
C115	Hot Water Savings (kWh/yr)						**-**
C116	Hot Water Source						**-**
C117	Thermal Savings ($/yr)	$776	$512	$40	$506		**$1,834**
C118	Thermal Savings	850	457	18	527		**1,852**
C119	De-Rate	4%	4%	4%	4%		
C120	Estimated Savings (kgal/yr)	415	229	17	400		**1,061**
C121	Water Savings ($/yr)	$1,967	$1,085	$82	$1,896		**$5,030**
C122	Thermal Savings ($/yr)	$744.9	$491.9	$38.2	$485.5		**$1,761**
C123	Thermal Savings	816	439	17	506		**1,778**

Sources: Amy Lucille Vickers, "Water Use and Conservation, First Edition" 2001.Pages, 25,27,77,88, and 103.

Water Heating Savings.

(1) Percent hot water for faucet and showerhead usage is 54%

(2) kWh=Gallons x .1337 cu ft/Gallon x Cp x (T2-T1) x .0002928 kWh/Btu, Cp=1.0 Btu/lbm/F, T2=120 F, T1=65 F

(3) Therms = Gallons x .1337 cu ft/Gallon x Cp x (T2-T1) / 100,000 Btu/Therm / eff., Cp=1.0 Btu/lbm/F, T2=120F, T1=65F, eff = .80

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	-	kwh/yr	0.00059190	Tons/kwh	0.0	Tons CO2/yr	-	0.0
Natural Gas	177.77	mmbtu/yr	0.05850000	Tons/mmBtu	10.4	Tons CO2/yr	1.816	1.1
#2 Fuel Oil	-	mmbtu/yr	0.01119000	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**10.4**		**1.816**	**1.1**

Exhibit D5-6B.1

Robbinsville School District

ECM 6B Steam Trap Refurbishment / Replacement

ECM Description:

Steam Trap Refurbishment / Replacement

Summary of Annual Energy Savings:

kWh

Therms 1,191

Assumptions, Clarifications, Deletions:

20% of Steam Traps have Failed

Calculation Formulas

Loss per Hour = 10.1*Orifice Dia.^2*(Steam Press.+14.7)

Measurement & Verification:

OPTION C - Utility Bill Analysis. - Thermal

Commissioning:

Third Party commissioning as per NJ ESIP

Data and Calculations:

Building	Thermo-static	F&T or Bucket	Total Traps	Mlb Savings	$/Therm	Therms	Therms $$	De-Rate	Therms	Therms $$
Windsor	18	6	24	108	$2.26	1,241	$2,805	4%	1,191	$2,693
Totals	**18**	**6**	**24**	**108**		**1,241**	**$2,805**		**1,191**	**$2,693**

Windsor	5,897	SF
Failed Traps Losses at 2% Total Steam Capacity		
Leaking Traps at 2 % Total Steam Capacity		
Cost of Fuel:	$9.1	/MMBtu
Boiler Efficency	85%	

Hours/ Year	Steam Press. Psig	Equip.	Steam Trap Model	Orifice Dia. (Inches)	Trap Qty	20.0% Failed Qty	Single Trap Failed Loss/hr	Total Steam Loss Lb/hr	Annual Steam Losses Mlb/year
4380	7	Drip	Thermo.	0.250	1	0.2	13.7	2.7	12
4380	7	Drip	F&T	0.188	0	0.0	7.7	0.0	0
4380	7	Hvac	3/4" - 1" F&T	0.218	6	1.2	10.4	12.5	55
2000	2	Hvac	1-1/4" F&T	0.312	0	0.0	16.4	0.0	0
2000	2	Hvac	1-1/2" F&T	0.390	0	0.0	25.7	0.0	0
1000	2	Rad	Thermo.	0.250	5	1.0	10.5	10.5	11
1200	2	Rad	UV	0.250	12	2.4	10.5	25.3	30
					24	**4.8**		**51.1**	**108**

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	-	kwh/yr	0.000592	Tons/kwh	0.0	Tons CO2/yr	-	0.0
Natural Gas	119	mmbtu/yr	0.058500	Tons/mmBtu	7.0	Tons CO2/yr	1.2	0.7
Totals					**7.0**		**1.2**	**0.7**

Exhibit D5-7A.1
Robbinsville School District
ECM 7A Computer Controllers
Computer Monitor Upgrade

ECM Description:
Computer Monitor Upgrade
Summary of Annual Energy Savings:
kWh 20,432
Therms
Assumptions, Clarifications, Deletions:
Assume 50% of Monitors are CRT and will be upgraded.
Calculation Formulas
Savings (kWh) = CRT Monitor Power Consumption - LCD Monitor Power Consumption

Measurement & Verification:
OPTION A Stipulated Savings - Electric

Commissioning:
Third Party commissioning as per NJ ESIP

Data and Calculations:

		Robbinsville HS	Pond MS	Windsor ES	Sharon ES	Total	
C8	**CRT Monitors**						
C9	Total Number of Monitors	327	309	10	318	**964**	
C10	Number of CRT Monitors	133	139	5	152		
C11	Power Consumption (Watt)	73	73	73	73		
C13	Annual Hours of Power Management	1,080	1,080	1,080	1,080		
C14	Annual Energy Use (kWh)	10,486	10,959	394	11,984		(C11-C12)*C13/1000*C10
C15	**LCD Monitors**						
C16	Total Number						
C17	New LCD Monitors Required	133	139	5	152	**429**	Assume 50%
C18	"Idle" Power Consumption (Watt)	28	28	28	28		
C20	Annual Hours of Power Management	1,080	1,080	1,080	1,080		180*8+90*22
C21	Annual Energy Savings (kWh)	4,022	4,203	151	4,596		(C18-C19)*C20/1000*C17
C22	**Savings**						
C29	Cost per kWh	$ 0.14	$ 0.15	$ 0.18	$ 0.15		
C30	**Savings kWh**	6,464	6,755	243	7,387	**20,849**	C28+C21+C14+C7
C31	**Total kWh$$**	$928	$1,000	$43	$1,084	**$3,056**	C30*C29
C32	**De-rate**	2%	2%	2%	2%		
C33	**kWh**	6,335	6,620	238	7,239	**20,432**	C30*(1-C32)
C34	**kWh $$**	$909	$980	$43	$1,063	**$2,995**	C31*(1-C32)

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	20,432	kwh/yr	0.000592	Tons/kwh	12.1	Tons CO2/yr	2.1	1.3
Natural Gas	-	mmbtu/yr	0.058500	Tons/mmBtu	0.0	Tons CO2/yr	-	0.0
#2 Fuel Oil	-	mmbtu/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**12.1**		**2.1**	**1.3**

Exhibit D5-7B.1
Robbinsville School District
ECM 7B Computer Controllers
Virtual Computer Work Stations

ECM Description:
Virtual Work Stations

Summary of Annual Energy Savings:
kWh 68,964
Therms

Assumptions, Clarifications, Deletions:
Assume average work station consumption of 80 Watts
Assume individual work station operating hours = 1,080 hours /per year

Calculation Formulas
Savings (kWh) = Power Consumption of Existing Work Stations - Power Consumption of Virual Work Sations

Measurement & Verification:
OPTION A Stipulated Savings - Electric

Commissioning:
Third Party commissioning as per NJ ESIP

Data and Calculations:

		Robbinsville HS	Pond MS	Windsor	Sharon ES		Total	
C1	Average Current Power Consumption (Watts)	80.05	80.05	80.05	80.05			
C2	Number of Computers	327	309	10	318		964	
C3	Power Requirement per Computer (kW)	0.0801	0.0801	0.0801	0.0801			
C4	Run Hours	1,080	1,080	1,080	1,080			
C5	Total Power (kWh)	28,271	26,714	865	27,493		83,342	
C6	R710 Server (60 Work Stations/Server)	6.00	6.00	1.00	6.00			
C7	R710 Server Unit Power	0.27	0.27	0.27	0.27			
C8	WYSE Units Required	327	309	10	318			
C9	WYSE Unit Power	0.0072	0.0072	0.0072	0.0072			
C10	Total Power	4,272	4,132	366	4,202		12,971	
C11	Cost per kWh	$0.1417	$0.1462	$0.1810	$0.1409			
C12	Savings kWh	23,999	22,583	499	23,291		70,371	
C13	Savings kWh $$	$3,400	$3,301	$90	$3,281		$10,072	
C14	De-Rate Savings	2%	2%	2%	2%			
C15	Savings kWh	23,519	22,131	489	22,825		68,964	
C16	Savings kWh $$	$3,332	$3,235	$88	$3,216		$9,871	

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	68,964	kwh/yr	0.000592	Tons/kwh	40.8	Tons CO2/yr	7.1	4.3
Natural Gas	-	mmbtu/yr	0.058500	Tons/mmBtu	0.0	Tons CO2/yr	-	0.0
#2 Fuel Oil	-	mmbtu/yr	0.011190	Tons/gal	0.0	Tons CO2/yr	-	0.0
Totals					**40.8**		**7.1**	**4.3**

Exhibit D5-8A.1
Robbinsville School District
ECM 8C Photovoltaic Array

ECM Description:
Solar PV
Summary of Annual Energy Savings:
kWh 2,033,868
Therms
Assumptions, Clarifications, Deletions:

Calculation Formulas
Solar Output = Solar Radiation Rate per Square Meter per day x hours/month
Measurement & Verification:
OPTION A Stipulated Savings - Electric

Commissioning:
Third Party commissioning as per NJ ESIP
Data and Calculations:

	Energy Value ($)	Panel	Qty	Size kW	Solar Radiation (kWh/m2/day)	AC Energy (kWh)	Energy Value ($)	De-Rate	AC Energy (kWh)	Energy Value ($)
Robbinsville HS	0.1436	240	2786	669	4.46	788,024	$113,133	2%	772,264	$110,871
Pond MS	0.1481	240	4032	968	4.46	1,140,835	$168,945	2%	1,118,018	$165,566
Sharon ES	0.1468	240	518	124	4.46	146,517	$21,509	2%	143,587	$21,079
Totals			**7336**	**1761**		**2,075,376**	**$303,588**		**2,033,868**	**$297,516**

Greenhouse Gas Emissions (GHGs)

Fuel	**Savings**	**Units**	**Carbon Emission Factor**	**Units**	**Emissions**		**Equivalent Cars/yr**	**Equivalent Forested Acres/yr**
Electricity	2,033,868	kwh/yr	0.000592	Tons/kwh	1203.8	Tons CO2/yr	210.3	126.7
Natural Gas	-	mmbtu/yr	0.058500	Tons/mmBtu	0.0	Tons CO2/yr	-	0.0
Totals					**1203.8**		**210.3**	**126.7**

Exhibit D5-9.1
Robbinsville School District
ECM 9 Demand Response

ECM Description:
Demand Response

Summary of Annual Energy Savings:
kWh 115,792
Therms

Assumptions, Clarifications, Deletions:
PJM Demand Response Program based on Shedable Load on Peak Demand Curtailment Day
Assume 2% of Total District Load as Shedable
Savings is not Guaranteed any savings from program will be considered operational savings only

Calculation Formulas
Demand Response Savings = Assumed between 1 - 4% Annual Electrical Load
Customer will share 60% of Savings

Measurement & Verification:
N/A

Commissioning:
N/A

Data and Calculations:

	Total Kwh Usage	Demand Response Savings	Demand Response Savings	Customer Share	KWh Savings	$/kWh	kWh Saving $$	De-Rate	KWh Savings	kWh Saving $$
Robbinsville HS	2,578,800	4%	103,152	60%	61,891	$0.14	$8,885	2%	60,653	$8,708
Pond MS	1,505,300	4%	60,212	60%	36,127	$0.15	$5,350	2%	35,405	$5,243
Windsor ES	22,780	4%	911	60%	547	$0.18	$98	2%	536	$96
Sharon ES	816,259	4%	32,650	60%	19,590	$0.15	$2,876	2%	19,198	$2,818
					118,155		**$17,209**		**115,792**	**$16,865**

Greenhouse Gas Emissions (GHGs)

Fuel	Savings	Units	Carbon Emission Factor	Units	Emissions		Equivalent Cars/yr	Equivalent Forested Acres/yr
Electricity	115,792	kwh/yr	0.00059190	Tons/kwh	68.5	Tons CO2/yr	11.972	7.2
Natural Gas	-	mmbtu/yr	0.05850000	Tons/mmBtu	0.0	Tons CO2/yr	-	0.0
Totals					**68.5**		**11.972**	**7.2**

SECTION E: Measurement, Verification and Guarantee of Energy Savings Recommended Preventive Maintenance Services

Honeywell has proven capabilities in applying measurement and verification methods appropriately to develop and verify energy baselines. Honeywell has also demonstrated abilities to conduct post-installation and regular interval verification inspections to confirm guaranteed energy savings.

Honeywell will develop savings methodologies that follow current industry practice, such as outlined by the New Jersey Board of Public Utilities (NJBPU), Federal Energy Management Program's (FEMP) M&V Guidelines: Measurement and Verification for Federal Energy Projects. References to M&V protocols from the International Performance Measurement and Verification Protocol (IPMVP), ASHRAE Guideline 14 and the Air-Conditioning Refrigeration Institute (ARI) are used to further qualify the M&V plan.

Honeywell uses a variety of the M&V options as defined in the NJBPU Guidelines, as the basis for selecting methodologies to evaluate each Energy Conservation Measure (ECM) technology category identified and implemented through a performance contract.

In all performance contracting agreements, Honeywell discusses the M&V options available for savings verification with the District during the audit phase. The following tables are used as benchmarks for these discussions. In all cases, a mutual decision is reached on the M&V protocols that will be used for each ECM.

For each implemented ECM, energy savings are derived from a mutually agreed-upon, site-specific M&V plan. The M&V plan will provide an explanation of the objectives for M&V activities, which will comply with the steps outlined in the NJBPU Guidelines.

The plan will also define the parameters to be monitored, and a detailed description of the usage groups, population sizes and sample sizes that are proposed for each ECM. Definition of the baseline, post-installation, and regular interval parameters associated with each ECM are also defined in the M&V plan.

An M&V Specialist will work in close concert with the Performance Contracting Engineers (PCE's), the project installation team, and your District to ensure that accurate information is obtained.

M&V Options Summary			
FEMP Guidelines / Option	**Verification of Potential to Perform (and Generate Savings)**	**Verification of Performance (Savings)**	**Performance Verification Techniques**
Option A - Verifying that the opportunity has the potential to perform and to generate savings	Yes	Stipulated	Engineering calculations (possibly including spot measurements) with stipulated values
Option B - Verifying that the opportunity has the potential to perform and verifying actual performance by end use	Yes	Yes	Engineering calculations with metering and monitoring throughout term of contract
Option C - Verifying that the opportunity has the potential to perform and verifying actual performance (whole building analysis)	Yes	Yes	Utility meter billing analysis
Option D - Simulating that the opportunity has the potential to perform and simulating actual performance	Yes	Yes	Computer simulation

<u>Honeywell Energy Auditing Process</u>

The audit process begins with baseline development *before* ECMs are designed and the contract is signed. It continues throughout the term of the contract guarantee, and can continue as an ongoing service at the conclusion of the guarantee period.

Energy auditing is a *process,* but not so rigidly structured that it is devoid of independent decision making. It is a mistake to think that the energy auditing process is a series of tasks, performed sequentially the same way every time. Honeywell looks at energy auditing as a systematic means of analyzing and reporting results, and deciding which actions to take to meet the requirements of specific contracts. The following summarizes the energy auditing process. Energy audits can be provided on a quarterly, semi-annual or annual basis as determined by the District.

1. Data about a building's operation, utility costs, and usage is assembled to establish the baseline energy consumption model. If changes did occur, adjustment calculations will need to be done and the district will need to approve the adjustment.
2. Data is analyzed to determine base loads and to provide a check of savings figures. (i.e. are energy savings figures realistic?)
3. Requirements of the Honeywell scope & internal Risk Review Process are completed. All personnel involved in the Review Process approve the project, including the Honeywell Measurement & Verification Specialist Lead.
4. Industry standard energy engineering calculations and methods are utilized and are part of the contract documents. All calculations will be reviewed to satisfy the requirement that these must be a reasonable representation, or model, of facility energy consumption before and after the energy retrofit projects are completed.

5. The *Project Manager* will help ensure performance compliance, and will be responsible for proper installation, operation, and maintenance of the ECMs in accordance with design and contractual parameters. This includes ensuring that verification data is accurately collected and analyzed, and that measuring equipment is calibrated in accordance with prescribed standards.

Measurement and Verification Options

Options A, B, C, and D are four options which contain measurement guidelines consistent with those defined in the September 2000 version of the FEMP M&V Guidelines. The four options were created to provide flexibility in the determination of savings.

This flexibility allows one to arrive at an optimum position regarding increased cost for decreased uncertainty in the determination the realized savings. The District's expectations and specific features of the campus facilities will dictate which particular option (A, B, C, or D) will be the most reasonable and cost-effective solution, providing accountable and verifiable results.

Option A – No Metering / Spot Metering

Requires verification that the ECM has the potential to perform and to generate savings. Verification of performance (savings) may be stipulated. Performance verification techniques for Option A include engineering calculations, spot measurements or stipulated (mutually agreed-upon) values. Field audits will be required in most cases with the application of Option A.

Spot metering will entail taking instantaneous measurement of volts, amperes, kVA, pF and kW. Measurements will be taken one time only. The type of data collection devices include: run-time loggers, kW/kWh transducers, occupancy data loggers, flow meters, and digital hygrometers. Measurement equipment will be calibrated in accordance with the manufacturer's specifications.

Option B – Regular Interval / Continuous Metering

Requires verification that the ECM has the potential to perform. It also requires verification of actual performance by end-use system or device. Verification of performance (savings) is required with this option. Performance verification techniques include engineering calculations, spot and short-term metering or continuous metering. Development of a sampling plan may be required when using Option B as measurement and verification option.

Short term metering will be conducted for a minimum period of three weeks. The data collected may be used to extrapolate after retrofit annual energy demand and consumption profiles.

Continuous data collection is done by totalization and trending consumption of energy consuming systems or end-use devices through an energy management system (EMS) or placement of an additional meter (sub-metering).

Option C – Utility Bill Analysis

Requires verification that the opportunity has the potential to perform, as well as verification of actual performance via whole building analysis. Verification of potential to perform (generate savings) and verification of performance (savings) is required with this option. Performance verification techniques include utility meter billing analysis possibly with computer simulation.

Utility bill analysis consists of the review of two years of utility data to determine and establish the 365-day baseline. The baseline model is developed from utility bills and independent variables such as weather, operating schedules, and occupancy patterns.

Utility data is entered into a baseline-modeling program such as Metrix® that performs utility billing analysis using multivariate regression. Adjustments to the baseline that may be required are mutually agreed upon. The Metrix® utility accounting system is a third party software package designed by SRC Systems, Inc. in Berkley, California. The utility accounting system is used to track, budget, and verify utility operating costs and savings.

Option D – Computer Simulation
Requires verification that the opportunity has the potential to perform, as well as verification of actual performance by end-use systems or devices. Verification of potential to perform (generate savings) and verification of performance (savings) is required with this option. The performance verification technique is a computer simulation analysis. Option D provides a measurement and verification protocol for those ECMs which involve building envelope improvements, upgrades/expansions of existing energy management systems, ECMs which are variable load projects, or those ECMs which have interactive effects. Computer simulation will involve developing models by such building simulation programs as DOE 2.1e, Carrier HAP, or Trace 600.

Baseline Adjustments
Regular Adjustments
Every time an energy audit (determination of energy savings) is performed, the "regular" adjustments are calculated and applied to the baseline usage and cost data. These are adjustments for weather, billing period length and utility rates. These adjustments are usually performed through energy accounting software such as Metrix.

Periodic Adjustments
Periodic adjustments are performed separately from the energy accounting software. Often these adjustments involve the application of building energy simulation tools and techniques. Because the periodic adjustments are performed separately and cannot be developed automatically through the energy accounting software, these adjustments are recalculated only when it appears that conditions have changed enough to warrant a recalculation.

Combining and Applying Adjustments
Once developed, the regular usage adjustments and periodic usage adjustments are combined with an Excel spreadsheet to arrive at the total month by month usage adjustment, which accurately reflects what the baseline period usage would have been under current period conditions. The applicable utility rate changes are then applied to arrive at what the baseline period energy costs would have been under current period conditions and rates. This figure is then compared against the actual current period energy cost to determine the amount of energy cost savings which has occurred.

Audit Adjustment Methodologies

The Energy Analyst will determine actual annual energy savings by comparing the energy consumed during each guarantee year, with the base year, adjusted as described below. The purpose of base year adjustments is to ensure that the annual reconciliation is quantified on a comparison of energy consumption for each type of fuel.

Some typical adjustments are related to the following:

- Added mechanical or HVAC equipment
- Additional square footage
- Office equipment (computers, copiers, etc.)
- Changes in occupancy
- Equipment failures

Specific adjustment methodologies are as follows:

Billing Period Adjustment
Adjustment to the monthly comparison periods will reflect same start date and equal number of days being compared.

Weather Adjustment
Adjustment to the base-year will reflect weather differences between the base-year or period and current year or period.

Square Footage Adjustment
Additions or permanent closures of floor space will be accounted for and factored into the comparison of the base-year and current period.

Utility Rate Adjustment
The energy audit methodology will use the rate schedules and charges documented in the contract as they apply to the current monthly bills.

Operational and Occupancy Hours Adjustment
Additions to or reductions in the sizes or types, as well as hours of operation of use for equipment will be accounted for and factored into the comparison of base-year and current period, based upon standard engineering calculations and data measured electronically for this purpose. Significant changes in conditioning set points will also be accounted for and adjusted.

Demand Charges Adjustment
Demand charges incurred as a result of equipment usage not controlled or operated for energy conservation under the project scope will be identified adjusted for in the annual savings reconciliation.

Audit Adjustment Procedures

If it is necessary to make baseline adjustments, the following adjustment procedures will be followed.

SECTION E: Measurement, Verification and Guarantee of Energy Savings

The Energy Analyst will estimate (using appropriate engineering calculations) how much energy was used due to the changed condition. The calculations will be based upon such factors as installed kW, BTU input, efficiency, runtime, etc.

For Example:
If the customer installed a new computer lab subsequent to the baseline year, and it has 30 PCs at 300 watts each and it runs 30 hours per week, the calculation would show:

30 PCs X 300 Watts = 9 kW (Peak load increase)
9 kW X 30 hrs per week = 270 kWh per week
270 kWh X 4 weeks = 1080 kWh per four week period.

An increase usage of about 1,080 kWh per 4-week period, plus an additional peak load of 9 kW.

The Energy Analyst will document all changes in the audit:

- Equipment sizes
- Operating hours
- Energy calculation used
- Results

This information will be shown as adjustment documentation that is a permanent part of the audit file, and is used in preparing energy audits. It will be tracked throughout the term of the contract. Without such adjustments, increased energy usage at the facility would reduce the value of the cost avoidance calculated by Metrix.

This is because cost avoidance is based on adjusted energy reduction-the difference between adjusted baseline energy consumption and current energy consumption. If the baseline is not adjusted upward to account for additional energy consumption (that Honeywell has no control over, and which was not present during the base year), the adjusted energy reduction will be less than the amount we had based our savings guarantee on.

The customer must agree to and understand all adjustments at the time of audit delivery (quarterly, semiannual, or annual). Their agreement and acceptance of the audit indicates their acceptance of the audit methodology, including all adjustments (due to changes in weather, changes in occupancy, addition of new equipment, etc.).

<u>ECM-based Measurement and Verification (M&V) Audit Adjustments</u>
ECM-based Measurement and Verification (M&V), is another credible way to demonstrate energy savings. The technique has evolved considerably with the adoption of automated data collection tools (such as building automation systems with direct digital controllers, programmable meters and dataloggers) in facilities. ECM-based measurement and verification is the derivation of energy savings (and the associated value of those savings) from measured data collected before and after the implementation of the energy conservation measures (ECMs). It can also apply to demand savings, and the associated value of those savings. A form of this technique can be used for supply-side strategies that reduce the cost of the energy consumed (examples are cogeneration, thermal storage, and rate-switching or fuel-switching projects).

ECM Based M&V Audits are different from the utility bill auditing methods, which uses data obtained from the monthly bills. With the utility bill auditing method, it can be difficult to impossible to quantify the value of adjustments to baseline energy consumption, especially in a facility with few meters and many energy events that are not measured.

In ECM-Based Measurement and Verification, the ongoing energy savings are measured and calculated using the same calculation models and measurement methods that were used to determine the baseline energy savings. The Energy Analyst and the Engineer work closely together to ensure that the audit methodology matches the methodology used for the original energy savings estimates.

When ECM-based Measurement and Verification is used, the following five components are essential for demonstrating guaranteed energy savings:

1. Pre-retrofit energy use profile (baseline).
2. Post-retrofit time-of -use measurement.
3. Post-retrofit energy and/or demand measurement (directly measured or derived from other measured variables).
4. Post-retrofit value of energy and demand saved.
5. Acceptable sampling plan.

In Utility Bill Auditing, Honeywell uses energy consumption and demand information for the entire facility to develop the baseline energy use. In ECM-Based Measurement and Verification, Honeywell will model the energy use and demand associated with each individual ECM implemented.

Dollar Savings Calculations
Honeywell's policy to assigning a dollar value to savings is to first identify the consumption reduction of the particular utility. When the consumption reduction is identified, the corresponding cost of the utility unit is used to determine the value of the savings. The savings is based upon units of energy and the dollar value is associated with agreed upon based year per unit costs for oil, electric, gas, and water.

Maintenance Savings
For each improvement measure a list of potential maintenance savings or benefits will be developed. This list will be reviewed with the Robbinsville Public School District to determine if any maintenance or material dollars can be applied to help justify specific investments identified in the audit.

Guaranteed Savings

The approach that Honeywell utilizes in this asset management program includes two key components: a *performance guarantee* and *financial savings*. Honeywell guarantees the Customer that all installations and work performed are subject to final inspection and Customer's acceptance. This procedure ensures all work will be to the level of quality the Customer expects.

Honeywell also guarantees it will meet the objectives mutually defined with the Customer. Honeywell takes its commitment to partner with the Customer for the life of the contract seriously, and looks forward to a successful, long-term partnership.

SECTION E: Measurement, Verification and Guarantee of Energy Savings

Honeywell will provide a cost avoidance guarantee to the Customer. It will contain both energy and operational savings based on data from your utility bills, building operation, and budget information. The energy savings guarantee is structured to accommodate changes in utility rates, changes in building structures, changes in building occupancy patterns, and weather variances. In simple terms, this means that Honeywell guarantees a level of energy consumption based on conditions as they existed in the base year. Any changes or modifications to the buildings operating conditions need to be communicated on a regular basis. An example of this would be constructing an addition on a building. This addition would increase your energy baseline and would need to be documented. The energy guarantee is documented with any assumptions in our final contract and is shown in Attachments F & G, in our contract.

Honeywell considers the guarantee to be the cornerstone of our service to you. To be considered a *performance contract* an energy guarantee is a required component. The basis of an energy performance contract is that the majority of risk is shifted from the customer to the vendor. The strength of the Guarantee is only as good as the Company backing it and their financial solvency. Honeywell has entered into over 4,300 energy performance contracts and has had over $1 Billion in energy guarantees. We have the strength and background to support the Customer for the long term.

It is important to make a distinction between Honeywell's guarantee and other possible savings assurance structures. Honeywell guarantees that the Customer will benefit from 100% of the cost savings, reductions, and cost avoidance realized. Alternate structures that may be proposed by other vendors include having the Customer share savings with the vendor, effectively reducing both the scope achievable under the savings captured by the Customer and limiting the overall financial benefits.

The guarantee is generally structured to cover the ongoing monitoring and auditing. Honeywell will work with the Customer to determine the scope of ongoing maintenance services required in order for the guarantee to remain in place and for the savings to be achieved.

Recommended Preventive Maintenance Services

Service & Maintenance

A Comprehensive Portfolio, a Customized Approach.

Honeywell offers a uniquely comprehensive portfolio of services – one of the most extensive in the industry. As part of the Energy Savings Plan, we recommend the following services for consideration to ensure achievement of the Enrgy Savings outlined in this plam

According to the NJ ESIP program, all services are required to be bid by the school district for services as desired. Based on Honeywell's vast service organization, we are uniquely qualified to develop design specifications for public bidding according to NJ Law.

Honeywell strongly believes that the long-term success of any conservation program is equally dependent upon the appropriate application of energy savings technologies, as well as solid fundamental maintenance and support. One of the primary contributors to energy waste and premature physical plant deterioration is the lack of proper operations, personnel training and equipment maintenance.

Honeywell recommends routine maintenance on the following systems throughout the district for the duration of an energy guarantee of savings

Maintenance, Repair and Retrofit Services:

- Mechanical Systems
- Building Automation Systems
- Temperature Control Systems
- Air Filtration

Honeywell will work with the School District to evaluate current maintenance practices and procedures. This information will be the basis of a preventive maintenance and performance management plan designed to maximize building operating efficiencies, extend the useful life of your equipment and support the designed Energy Savings Plan.

At a minimum, we recommend the following tasks be performed on a quarterly basis with the district wide Building Management System.

System Support Services

1. Review recent mechanical system operation and issues with customer primary contact, on a monthly basis.
2. Review online automation system operation and event history logs and provide summary status to the customer primary contact. Identify systemic or commonly re-occurring events.
3. Check with customer primary contact and logbook to verify that all software programs are operating correctly.
4. Identify issues and prioritize maintenance requests as required.
5. Provide technical support services for trouble shooting and problem solving as required during scheduled visits.
6. Provide ongoing system review and operations training support; including two semi-annual lunches and learn sessions.
7. Establish dedicated, site-specific emergency stock of spare parts to ensure prompt replacement of critical components. These will be stored in a secure location with controlled access.

Configuration Management

1. Update documentation and software archives with any minor changes to software made during maintenance work.
2. Verify and record operating systems and databases.
3. Record system software revisions and update levels.
4. Archive software in designated offsite Honeywell storage facility, on an annual basis.
5. Provide offline software imaging for disaster recovery procedures, updated on a regular basis.

Front End / PC Service

1. Verify operation of personal computer and software:
2. Check for PC errors on boot up
3. Check for Windows errors on boot up
4. Check for software operations and performance, responsiveness of system, speed of software
5. Routinely back up system files, on an annual basis:
6. Trend data, alarm information and operator activity data
7. Custom graphics and other information
8. Ensure disaster recovery procedures are updated with current files
9. Clean drives and PC housing, on an annual basis:
10. Open PC and remove dust and dirt from fans and surfaces
11. Open PC interface assemblies and remove dust and dirt
12. Clean and verify operation of monitors.
13. Verify printer operation, check ribbon or ink.
14. Initiate and check log printing functions.
15. Verify modem operation (if applicable).
16. Review IVR schedule for alarms and review (if applicable).

Temperature Control / Mechanical Services

TEMPERATURE CONTROLS

Services Performed

UNIT VENTS

Services Performed
Annual Inspection
1. Inspect motor and lubricate.
2. Lubricate fan bearings.
3. Inspect coil(s) for leaks.
4. Vacuum interior.
5. Test operation of unit controls.

PUMPS

Services Performed
Preseason Inspection
1. Tighten loose nuts and bolts.
2. Check motor mounts and vibration pads.
3. Inspect electrical connections and contactors.

Seasonal Start-up
1. Lubricate pump and motor bearings per manufacturer's recommendations.
2. Visually check pump alignment and coupling.
3. Check motor operating conditions.
4. Inspect mechanical seals or pump packing.
5. Check hand valves.

Mid-season Inspection
1. Lubricate pump and motor bearings as required.
2. Inspect mechanical seals or pump packing.
3. Ascertain proper functioning.

Seasonal Shut-down
1. Switch off pump.
2. Verify position of hand valves.
3. Note repairs required during shut-down.

PACKAGED AIR-CONDITIONING SYSTEMS

Services Performed
Preseason Inspection
1. Energize crankcase heater.
2. Lubricate fan and motor bearings per manufacturer's recommendations.
3. Check belts and sheaves. Adjust as required.
4. Lubricate and adjust dampers and linkages.
5. Check condensate pan.

Seasonal Start-up
1. Check crankcase heater operation.
2. Check compressor oil level.
3. Inspect electrical connections, contactors, relays, operating and safety controls.
4. Start compressor and check operating conditions. Adjust as required.
5. Check refrigerant charge.
6. Check motor operating conditions.
7. Inspect and calibrate temperature, safety and operational controls, as required.
8. Secure unit panels.
9. Pressure wash all evaporator and condenser coils (if applicable)
10. Log all operating data.

Mid-season Inspection
1. Lubricate fan and motor bearings per manufacturer's recommendations.
2. Check belts and sheaves. Adjust as required.
3. Check condensate pan and drain.
4. Check operating conditions. Adjust as required.
5. Log all operating data.

Seasonal Shut-down *
1. Shut down per manufacturer's recommendations.

* If no Shut-down is required then (2) Mid-season Inspections are performed

BOILERS
Services Performed
Preseason Inspection
1. Inspect fireside of boiler and record condition.
2. Brush and vacuum soot and dirt from flues (not chimneys) and combustion chamber.
3. Inspect firebrick and refractory for defects.
4. Visually inspect boiler pressure vessel for possible leaks and record condition.
5. Disassemble, inspect and clean low-water cutoff.
6. Check hand valves and automatic feed equipment. Repack and adjust as required.

7. Inspect, clean and lubricate the burner and combustion control equipment.
8. Reassemble boiler.
9. Check burner sequence of operation and combustion air equipment.
10. Check fuel piping for leaks and proper support.
11. Review manufacturer's recommendations for boiler and burner start-up.
12. Check fuel supply.
13. Check auxiliary equipment operation.

Seasonal Start-up
1. Inspect burner, boiler and controls prior to start-up.
2. Start burner and check operating controls.
3. Test safety controls and pressure relief valve.
4. Perform combustion analysis.
5. Make required control adjustments.
6. Log all operating conditions.
7. Review operating procedures and owner's log with boiler operator.

Mid-season Inspection
1. Review operator's log.
2. Check system operation.
3. Perform combustion analysis.
4. Make required control adjustments.
5. Log all operating conditions.
6. Review operating procedures and log with boiler operator.

Seasonal Shut-down
1. Review operator's log.
2. Note repairs required.

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SECTION F: Design Approach

In accordance with the ESIP PL 2009, c.4 as part of the implementation process, an agreement between your school district and Honeywell will determine the energy conservation measures (ECM's) to be implemented. The services of a NJ Licensed Engineering firm and / or Architectural firm shall then be secured in order to properly comply with local building codes, compliance issues and NJ Public contract law. Specifications will be designed and developed to exact standards as recommended by Honeywell in order to achieve all savings outlined in this Energy Savings Plan (ESP). Once specifications are completed, Honeywell will publicly solicit contractors capable of meeting the requirements of the specification for each trade. However, even before the completion of the bidding process, Honeywell project management will be engaged in order to maintain the overall project schedule and ensure the school district's expectations are met. An overview of these activities and functions are detailed below.

Project Management – Construction Management Planning

A Honeywell Project Management Plan defines the tasks that must be completed for your project. But more than task administration, our project management process oversees the efficient allocation of resources to complete those tasks.

Each project and each customer's requirements are unique. At Honeywell we address customer needs through a formal communication process. This begins by designating one of our project managers to be responsible for keeping the customer abreast of the status of the project.

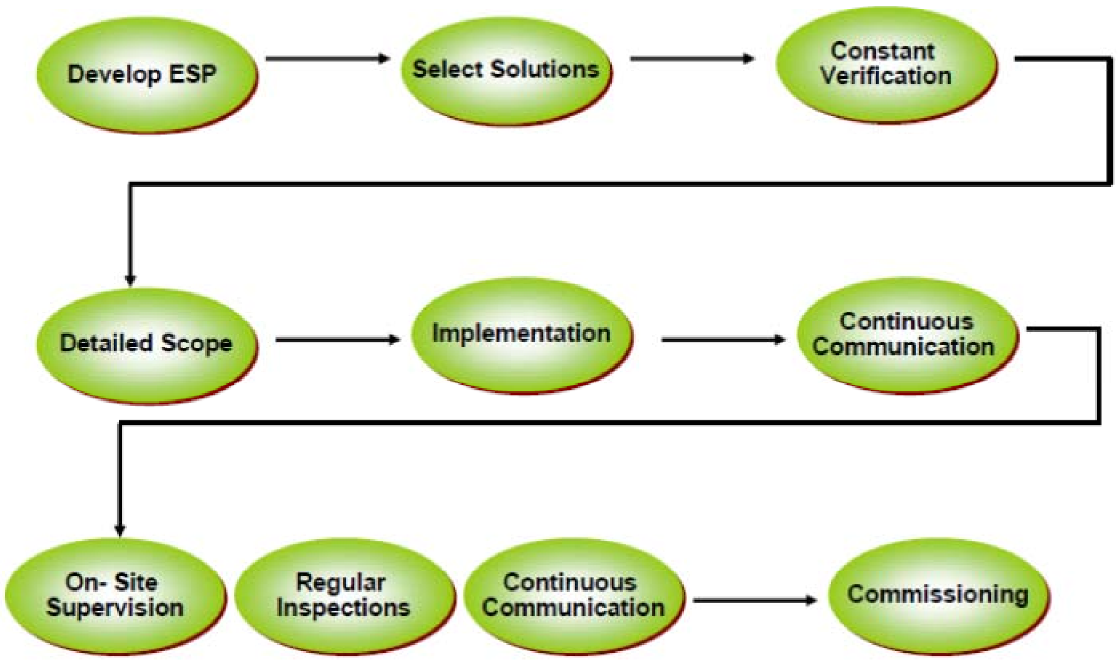
As the facilities improvements portion of the partnership begins, the Project Manager serves as a single focal point of responsibility for all aspects of the partnership. The Project Manager monitors labor, material, and project modifications related to the Robbinsville Public School District / Honeywell partnership and makes changes to ensure achievement of performance requirements in the facilities modernization component. The Project Manager regularly reviews the on-going process of the project with the customers.

The Project Manager will develop and maintain effective on-going contact with the District and all other project participants to resolve issues and update project status.

There are several challenges in this position. The Project Manager must staff the project and create a work force capable of handling the technologies associated with the project and plan for and use these personnel to achieve optimum results focused on occupant comfort and guarantee requirements.

The project management process applies technical knowledge, people skills, communication skills, and management talent in an on-site, proactive manner to ensure that our contract commitments are met on time, within budget, and with the quality you expect.

Project Management Process



Construction Management

Prior to any work in any buildings, our Project Managers, Bob Letso and Sal Corcione, will sit down with your administrative and building staff to outline the energy conservation upgrades that will be implemented. We will discuss proper contractor protocol for checking in and out of the buildings, identification requirements, dress codes and communication with your facilities staff. We will coordinate certain projects for alternate times of the day so we do not interrupt the building and learning environments. Our staff will work a combination of first and second shifts to accomplish the pre-set implementation schedule.

Communication is the key success factor in any construction management plan, and our project manager will be the key focal point during the installation process.

Our team will prevent schedule slippages by continuously tracking the location of all equipment and components required for the project. We make sure all equipment and components will be delivered on time prior to the scheduled date of delivery. Our thorough survey, evaluation and analysis of existing conditions, performed prior to the commencement of construction, will also prevent schedule slippages.

Honeywell is required to subcontract various portions of our projects to local contractors. Under the Robbinsville Public School District ESIP project, all subcontractors will be selected in accordance with New Jersey public contracts law. Typical areas that are subcontracted are as follows:

- Electrical Installation
- Water Conservation (Plumbing)
- HVAC Installation (depends upon the project size and scope)
- Associated General Contracting specialty items to support the project., (ceilings, windows, concrete, structural steel, roofing, demolition and removal of equipment, painting and rigging)

Honeywell uses the following guidelines in hiring subcontractors to perform work on our projects.

- Local Presence in the Community (Customer Recommendations)
- Firm's Qualifications and WBE/MBE Status
- Firm's Financial Stability
- Ability to perform the work within the project timeline
- Price
- Ability to provide service on the equipment or materials installed over a long period of time.

Final approval of all subcontractors that Honeywell proposes to utilize lies with the Robbinsville Public School District.

Commissioning

Honeywell provides full commissioning of energy conservation measures (ECM's) at the request of the customer. We will customize this process based on the complexity of Energy Conservation Measures.

Upon project acceptance by the Robbinsville Public School District the assigned Commissioning Agent (CA) will be responsible for start-up and commissioning of the new equipment and systems to be installed during the project. This will include verifying that the installed equipment meets specifications, is installed and started up in accordance with manufacturer's recommendations, and operates as intended. A commissioning plan will be prepared that describes the functional tests to be performed on the equipment and the acceptance criteria.

Prior to customer acceptance of the project, the CA submits the final commissioning report containing signed acceptance sheets for each ECM. Signed acceptance sheets are obtained upon demonstrating the functionality of each ECM to a school appointed representative.

Honeywell provides training for facility operators and personnel as needed when each ECM is completed and placed into service. All training is documented in the final commissioning report.

Installation Standards

When Honeywell designs a solution, we take into account current and future operations. For any upgrades we install, we follow building codes/standards, which dictate certain standards for energy or building improvements. Listed in tables following this section are standards for building design. During the life of the agreement, there is a partnership approach to maintaining these standards for reasons of comfort and reliability. For lighting our standard is generally to meet or exceed current light levels, achieving the relevant standards wherever possible.

In the case of lighting upgrades, we recommend that a group re-lamping of lamps be done around five years after the initial installation depending upon run times. Your building facility staff, on an as needed basis, can complete normal routine maintenance of lamps and ballasts. This maintains the quality of the lighting levels, and color rendering qualities of the lamps.

Space temperatures will be set by the energy management system and local building controls, and will be maintained on an annual basis. Flexibility will be maintained to regulate space temperatures as required to accommodate building occupant needs.

Your facility staff and building personnel will operate the energy management system with ongoing training and support from Honeywell. Therefore, both the District and Honeywell will maintain the standards of comfort. The comfort standards will be maintained throughout the life of the agreement through sound maintenance planning and services recommended as part of this ESP.

With regard to ventilation, Honeywell will upgrade ventilation to meet current standards in those areas where our scope of work involves upgrades to or replacement of systems providing building ventilation. We generally will not upgrade ventilation in those areas where our work doesn't involve the upgrade or replacement of systems or equipment providing ventilation to a building or facility.

Heating and Cooling Standards

Heating Temperatures	Cooling Temperatures	Unoccupied Temperatures
68-70° F	75° F	55-60° F

Lighting Standards:

NJUCC Bulletin 00-3 Minimum Light Levels	
Task Area	**Foot-candles**
Classroom and Instructional Areas: study halls, lecture rooms, art rooms, offices, libraries, conference rooms, work rooms, shops, laboratories and secondary school cafeterias.	50
Drafting, Typing and Sewing Rooms	70
Reception rooms, gymnasiums, auditoriums, primary school cafeterias, all-purpose rooms and swimming pools	30
Locker rooms, washrooms, toilet rooms, corridors containing lockers and stairways	10
Corridors without lockers and storerooms	5
Classrooms for the partially sighted	70

Honeywell uses a variety of in-house labor as well as subcontractors to install the energy conservation measures. We have on staff trained professionals in fire, security, energy management systems, automatic temperature control systems, and HVAC. However, according to the ESIP law, all trades will be publicly bid except for specific controls applications. Honeywell will also utilize the control system that is already in the facility so long as it can achieve the performance goals of the School District. Listed below is a sampling of some of the disciplines that would apply to the District:

Improvements	Honeywell	Subcontractor
Engineering Design/Analysis	X	
Technical Audit	X	
Construction Administration/Management	X	
Installation of Energy Management System	X	X
Manufacturer of Energy Management Equipment	X	X
Installation of HVAC/Mechanical Equipment		X
Installation of Renewable Technology		X
Installation of Building Envelope		X
Energy Supply Management Analysis/Implementation	X	
Installation of Boilers		X
Maintenance of Energy Management Equipment	X	X
Manufacturer/Installation of Temperature Control s	X	X
Monitoring/Verification Guarantee	X	
Training of Owner Staff	X	
Financial Responsibility for Energy Guarantees	X	

<u>Hazardous waste disposal or recycling</u>

Honeywell disposes of all PCB ballasts or mercury containing materials removed as part of the project per EPA guidelines. Honeywell will complete all of the required paperwork on behalf of the District. Honeywell will work with the School District to review your hazardous material reports, and will identify the areas where work will be completed so that the District can contract to have any necessary material abatement completed.

Honeywell can help schedule or coordinate waste removal, but cannot contract for or assume responsibility for the abatement work. Honeywell also has the capabilities to assist the District in working with the EPA under compliance management issues. We also develop and manufacture automated systems to track and report a wide variety of environmental factors.

Financing the ESIP

Upon adoption of this ESP, Honeywell will explore and obtain financing arrangements to fund the implementation phase of the process. Several options are available under the ESIP act PL 2009, c.4.

An ESIP can be financed through energy savings obligations. The term refers to the two primary financing tools, debt and lease-purchase instruments. Each of these options is discussed below.

Financing an ESIP is based on the principle, that with certain exceptions (i.e., audit and verification costs), the cost of the improvements (including planning, design, engineering, construction, etc.) will be paid through the value of reduced energy costs. Using the BPU protocols for calculating savings, energy costs, and inflation as standards across all local units is a critical component of the ESIP.

Energy savings obligations shall not be used to finance maintenance, guarantees, or the required third party verification of energy conservation measures guarantees. Energy saving obligations, however, may include the costs of an energy audit and the cost of verification of energy savings as part of adopting an energy savings plan or upon commissioning. While the audit and verification costs may be financed, they are not counted in the energy savings plan as a cost to be offset with savings.

In all cases, the maturity schedules for energy savings obligations must not exceed the estimated useful life of the individual energy conservation measure.

An ESIP can also include installation of renewable energy facilities, such as solar panels. Under an energy savings plan, solar panels can be installed, and the reduced cost of energy reflected as savings.

The law also provides that the cost of energy saving obligations may be treated as an element of the local unit's utility budget, as it replaces energy costs.

Debt Issuance

The law specifically authorizes municipalities, school districts, counties, and fire districts to issue refunding bonds as a general obligation, backed with full faith and credit of the local unit to finance the ESIP. Because an ESIP does not effectively authorize new costs or taxpayer obligations, the refunding bond is appropriate and proper, as it does not affect debt limits, or in the case of a board of education, require voter approval. The routine procedures for refunding bonds found in the Local Bond Law and Public School Bond Law would be followed for issuance of debt, along with any required Bond Anticipation Notes as authorized pursuant to law.

With regard to bonds for public schools, the Department of Education (DoE) has concluded that debt financed ESIP projects are not covered by State aid for debt service or a "Section 15 EFFCA Grant" as there is no new local debt being authorized.

Lease Purchase Financing

A local unit can enter into a lease-purchase agreement to implement an ESIP with a single investor lease or certificates of participation. The agreement can be entered into directly by the local unit, with ESCO, other private financing party, or through a county improvement authority or the New Jersey Economic Development Authority.

The following additional requirements affect ESIP leasing:

i. Ownership of the energy savings equipment or improvements shall remain with the third party financing entity until all lease payments have been made or other requirements of the financing documents for the satisfaction of the obligation are met. If improvements are made to facilities owned by the local unit, the local unit will have to enter into a ground lease of the facilities to be leased back to the local unit.

ii. The duration of a lease-purchase agreement shall not exceed 15 years, except that the duration of a lease purchase agreement for a combined heat and power (CHP) or cogeneration project shall not exceed 20 years. CHP and cogeneration facilities are specialized types of energy conservation measures. The law supersedes the existing 5 year limit on lease-purchase financing for these types of projects.

iii. Any lease purchase agreement may contain a clause making it subject to the availability of sufficient funds as may be required to meet the extended obligation; or a non-substitution clause maintaining that if the agreement is terminated for non-appropriation, the contracting unit may not replace the leased equipment. While normal for these types of leases, the optional nature in the law permits the transaction attorney to negotiate them as terms of a lease agreement.

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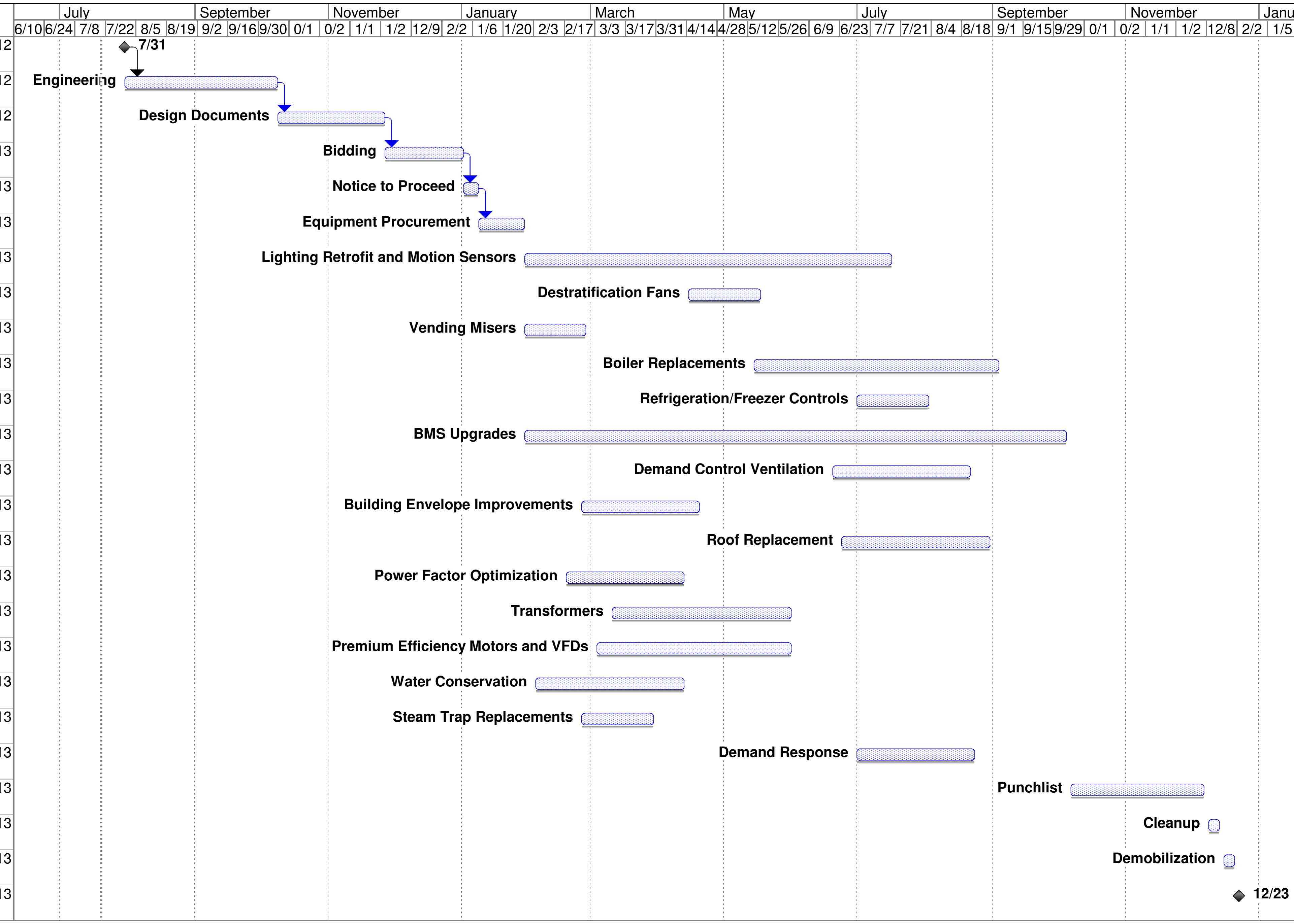
Robbinsville School District
Honeywell Energy Project
Installation Schedule

ID	Task Name	Duration	Start	Finish
1	Board Adoption of ESP and PDA	0 days	Tue 7/31/12	Tue 7/31/12
2	Engineering	50 days	Tue 7/31/12	Mon 10/8/12
3	Design Documents	35 days	Tue 10/9/12	Mon 11/26/12
4	Bidding	26 days	Tue 11/27/12	Tue 1/1/13
5	Notice to Proceed	5 days	Wed 1/2/13	Tue 1/8/13
6	Equipment Procurement	15 days	Wed 1/9/13	Tue 1/29/13
7	Lighting Retrofit and Motion Sensors	120 days	Wed 1/30/13	Tue 7/16/13
8	Destratification Fans	25 days	Mon 4/15/13	Fri 5/17/13
9	Vending Misers	20 days	Wed 1/30/13	Tue 2/26/13
10	Boiler Replacements	80 days	Wed 5/15/13	Tue 9/3/13
11	Refrigeration/Freezer Controls	25 days	Mon 7/1/13	Fri 8/2/13
12	BMS Upgrades	178 days	Wed 1/30/13	Fri 10/4/13
13	Demand Control Ventilation	45 days	Thu 6/20/13	Wed 8/21/13
14	Building Envelope Improvements	40 days	Mon 2/25/13	Fri 4/19/13
15	Roof Replacement	50 days	Mon 6/24/13	Fri 8/30/13
16	Power Factor Optimization	40 days	Mon 2/18/13	Fri 4/12/13
17	Transformers	60 days	Mon 3/11/13	Fri 5/31/13
18	Premium Efficiency Motors and VFDs	65 days	Mon 3/4/13	Fri 5/31/13
19	Water Conservation	50 days	Mon 2/4/13	Fri 4/12/13
20	Steam Trap Replacements	25 days	Mon 2/25/13	Fri 3/29/13
21	Demand Response	40 days	Mon 7/1/13	Fri 8/23/13
22	Punchlist	45 days	Mon 10/7/13	Fri 12/6/13
23	Cleanup	5 days	Mon 12/9/13	Fri 12/13/13
24	Demobilization	5 days	Mon 12/16/13	Fri 12/20/13
25	Delivery and Acceptance	0 days	Mon 12/23/13	Mon 12/23/13



Project: Robbinsville School District
Date: Fri 7/20/12

Task	Progress	Summary	External Tasks	Deadline
Split	Milestone	Project Summary	External Milestone	

APPENDIX

Independent Energy Audit (Electronic Copy)

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