HADDONFIELD SCHOOL DISTRICT ENERGY SAVINGS PLAN THROUGH AN ENERGY SAVINGS IMPROVEMENT PROGRAM

August 2024

PREPARED FOR:

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Honeywell

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Honeywell has reviewed the Request for Proposals and, if selected, reserves the right to negotiate mutually acceptable terms and conditions of any resulting contract.

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Notwithstanding any other provision of this document, this budgetary proposal is provided for information and planning purposes only, is non-binding, and does not constitute an offer capable of acceptance. Honeywell will be pleased to provide a firm price proposal upon request, subject to its internal approval requirements.

Honeywell reserves the right, in its discretion, to increase the price(s) set forth in this Proposal in the event that tariffs (or similar governmental charges) imposed by the United States or other countries result in any increase in the costs that Honeywell used to determine such price(s).

Equitable Extension of Time

Notwithstanding anything to the contrary, in light of the COVID-19 pandemic, the effects of which cannot be foreseen, the parties agree that Honeywell shall be entitled to an equitable extension of time to deliver or perform its work and appropriate additional compensation to the extent Honeywell's delivery or performance, or the delivery or performance of its suppliers and/or subcontractors, is in any way delayed, hindered or otherwise affected by the COVID-19 pandemic.

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SECTION A
EXECUTIVE SUMMARY

SECTION A – EXECUTIVE SUMMARY

Thank you for choosing to engage Honeywell to develop an Energy Savings Plan for the Haddonfield School District (the District) via your Omnia Co-op Membership.

The district hired Whitman Engineering to complete an ASHRAE Level II preliminary audit included in Appendix I.

It is understood that in order to remain compliant with the services of the Co-op for the Haddonfield School District; that ALL public works in conjunction with the School District and in accordance with NJ Public Contract Law (NJSA 18A:18A-1 et seq.) will be procured according to State requirements. To clarify further, this applies to a public works projects including and not limited to installing electrical, lighting, plumbing, HVAC, BMS systems etc.

During the development of the Energy Savings Plan, Honeywell has completed a thorough investment grade energy audit of the Haddonfield School District buildings and grounds. Based on the audit findings and Honeywell's extensive experience in working with school districts, we can confidently state this plan can identify a project that is financially viable in a comprehensive manner to address the District's facility concerns and goals.

This Energy Savings Plan includes projects that achieve energy and operational efficiencies, create a more comfortable and productive environment and are actionable via the New Jersey Energy Savings Improvement Program (NJ ESIP) in accordance with NJ PL2012, c.55.

ESIP PROJECT SPECIFICS

- Preliminary Energy Audit: Whitman Engineering
- Model type: ESCO Model
- Architect of Record: Lan Associates
- Engineer of Record: None
- Financial Advisor: NW Financial Group, LLC
- Independent Auditor of the ESP: Witman Engineering
- Bond Counsel: Wilentz Attorneys at Law

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:

- A description of the energy conservation measures (ECMs) that will comprise the program.
- An estimate of greenhouse gas reductions resulting from those energy savings.
- Identification of all design and compliance issues and identification of who will provide these services.
- An assessment of risks involved in the successful implementation of the plan.
- Identify the eligibility for, and costs and revenues associated with, the PJM Independent System Operator for demand response and curtail-able service activities.
- Schedules showing calculations of all costs of implementing the proposed energy conservation measures and the projected energy savings.

- Maintenance requirements necessary to ensure continued energy savings, and describe how they will be provided; and

Additionally, the use of Omnia Cooperative in the selection of Honeywell is allowed under NJ Public Contracts law as outlined in LFN 2012-10 and consists of the following elements and authorized by DLGS/DCA as well as the following elements:

- An organization (profit or not-for-profit) that coordinates and aggregates contracts from different state and local governments and promotes their use."
- In the context of the LPCL and PSCL, the provisions of this notice apply when the aggregate value of the goods or services (see N.J.A.C. 5:34-8.2) exceeds the contracting unit's bid threshold."
- The national cooperative contract must have been advertised as a national or regional cooperative and awarded pursuant to a competitive bidding process that complies with the laws applicable.
- The LFN requires that if a national cooperative contract is chosen, the calculation of cost savings from using this approach must be documented: The Law requires that a contracting unit can use national cooperatives only when the contracting unit determines "that the use of the cooperative purchasing agreement shall result in cost savings after all factors, including charges for service, material, and delivery, have been considered."
- The LFN states that if using an online ordering system, local officials must put "appropriate internal controls" in place to ensure that purchases are documented and that an audit trail exists
- Per the LFN, the Haddonfield School District BOE must verify that the selected vendor complies with applicable New Jersey procurement documentation requirements. The following required and other forms can be found in **Appendix 5** of this document:
  - New Jersey Business Registration Certificate for the contractor and any subcontractors (i.e., copy of certificate)
  - Statement of Corporate Ownership (an original form prepared for the contracting agency awarding the contract)
  - Public Contract EEO Compliance (Employee Information Report form or proof of participation in a federally approved affirmative action program)
  - Non-collusion Affidavit

The purpose of this document is to provide all the information required for the Haddonfield 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 District. This is not meant to infer that all the ECMs identified can be implemented. However, if the ECM is part of this plan, it may be implemented later as additional funding becomes available or technology changes to provide for an improved financial return.

This 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. **Executive Summary** (This Section)

B. **Preliminary Utility Analysis** – The Preliminary Utility Analysis (PUA) defines the utility baseline for the Haddonfield School District buildings included in the Energy Savings Plan. It provides an overview of the current usage and a cost per square foot by building of utility expenses.

The report also compares the Haddonfield School District 's utility consumption to that of other districts in the same region on a per square foot basis.

C. **Energy Conservation Measures** – This section includes a detailed description of the ECMs we have identified for your School District. It is specific to your facilities in scope, savings methodology and environmental impact. It is intended to provide a basis of design for each measure in narrative form. It is not intended to be a detailed specification for construction. ALL potential ECMs for the Haddonfield School District are identified for the purposes of potential inclusion in the program. Final selected ECMs are to be determined solely by the Haddonfield School District and the financial goals outlined within the ESIP program to be self-funding within existing budget guidelines. The sample ECM selections and preliminary financials are based on the selections noted in Form II in the Technical and financial summary.

D. **Technical and Financial Summary** – This section includes an accounting of all technical and financial outcomes associated with the ECMs as presented. The information detailed on the forms includes projected implementation hard costs, projected energy savings, projected operational savings and projected environmental impact. Form VI: Annual Cash Flow Analysis provides a "rolled-up" view of the overall project financials, inclusive of financing costs, on an annual basis as well as over the entire 19-year term of the agreement.

E. **Measurement & Verification and Maintenance Plan** – This section identifies the intended 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. Consistent maintenance is essential to achieving the energy savings projected in this plan.

Appendices 1-6 – The following files have been uploaded to a Teams Folder once reviewed will be provided on a USB drive to be included with our final submission:

- **Appendix 1** — Local Government Energy Audits
- **Appendix 2**— ECM Calculations
- **Appendix 3**— Equipment Cut Sheets
- **Appendix 4**— Lighting Line By Line
- **Appendix 5**— Required Forms & Omnia Cooperative / NJ Procurement Documentation

BENEFITS

The measures investigated in this Energy Savings Plan could result in an annual utility savings of 896,750 kWh of electricity and 69,056 therms. Additionally, these energy savings will result in a net reduction of greenhouse gases and will reduce the school district's carbon footprint by 633 MTE of CO2 annually. This is equivalent to removing 134 cars from the road annually and /or 600 forested acres per year. All these savings are achieved while improving the classroom environment and renewing many items that have been in service beyond useful life expectancy.

Overall, it is evident that the Haddonfield School District is well positioned to implement a program that will upgrade your facilities, while funding itself within the requirements of the law and with zero impact on your taxpayer base. We appreciate the opportunity to provide the District with this guideline to improve

the comfort and efficiency of your facilities through the successful implementation of this Energy Savings Plan should the district decide to move forward with a project.

SECTION B
PRELIMINARY UTILITY ANALYSIS (PUA)

SECTION B —PRELIMINARY UTILITY ANALYSIS (PUA)

Honeywell

Preliminary Utility Analysis

Haddonfield SD
Haddonfield, NJ

Helping customers manage energy resources to improve financial performance

Executive Summary

Honeywell would like to thank you for the opportunity of providing you with this Preliminary Utility Analysis. A one year detailed billing analysis was completed for all utility data provided by your staff. The facility's electric and gas consumption were compared to a benchmark of typical facilities of similar use and location. It should be noted however, that some of Buildings which make up the benchmarking standards are not equipped with mechanical cooling (air conditioning). Therefore, these buildings may unjustly appear to be less efficient in comparison.

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
- Control Systems
- Boilers
- AC Units/Condensers
- Building Enevelope
- Package Rooftop Units
- Domestic Hot Water Heaters
- Plug Load Management

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 $5 Billion in customer energy savings
- Honeywell provides you with "Single Source Responsibility" - from Engineering to Implementation, Servicing and Financing (if desired)

Energy Benchmarking

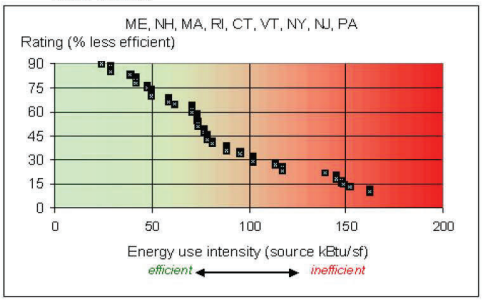
The calculation of EUI (Energy Use Intensity) is shown below. EUI, expressed in kBtu/sf, is normalized for floor area, the most dominant influence on energy use in most buildings. Its use usually provides a good approximation of how your building's energy performance compares to others. Site EUI indicates 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.

The Source EUI below has been applied to a Department of Energy statistical model from the Oak Ridge National Laboratory. 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.)

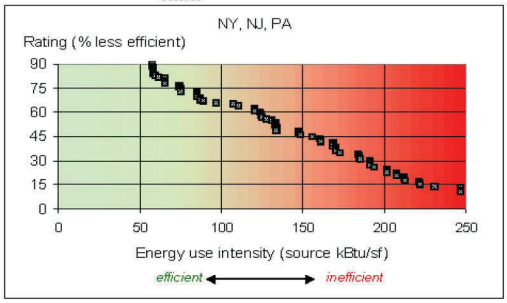
Source EUI Rating for your Building	Energy use and cost reduction potential (%)	Walk-thru energy assessment recommended?
above 60%	below 25%	No
40 to 60%	20 to 35%	Maybe
20 to 40%	35 to 50%	Yes
Below 20%	above 50%	Definitely

Site EUI Rank		Annual Total Electrical Use (kWh)	Annual Total Non-Electrical Fuel Use (Therms)	Building Gross Floor Area (sq-ft)	Site EUI Rating	Source EUI: Annual Total Source Energy Use per Sq-Ft (kBtu/sf)	Rating (Regional Source EUI Comparison)
1	Haddonfield Middle School & Central Elementary	1,176,471	72,379	166,819	67	116	30%
2	J. Fithian Tatem Elementary	453,586	21,581	51,820	72	132	20%
3	Haddonfield High School	1,351,557	123,616	210,267	81	125	20%
4	Elizabeth Haddon Elementary School	368,944	32,846	47,672	95	149	15%
		3,350,558					

School Facilities



Offices



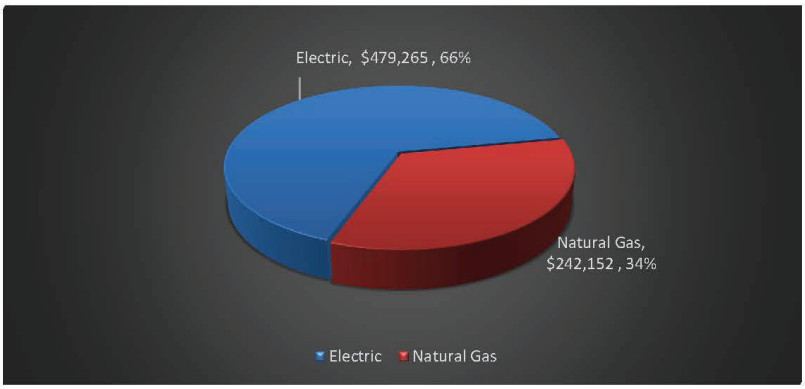
Historical Summary

Utility Analysis Period:
Jan 2022 to Dec 2022

	Electric	Natural Gas
Utility Costs*	$479,265	$242,152
Utility Usage (kWh, Therms)	3,350,558	250,421
$ Cost/Unit (kWh, Therms)	$0.14304	$0.967
Annual Electric Demand (kW)	12,143	

* Costs include energy and demand components, as well as taxes, surcharges, etc.

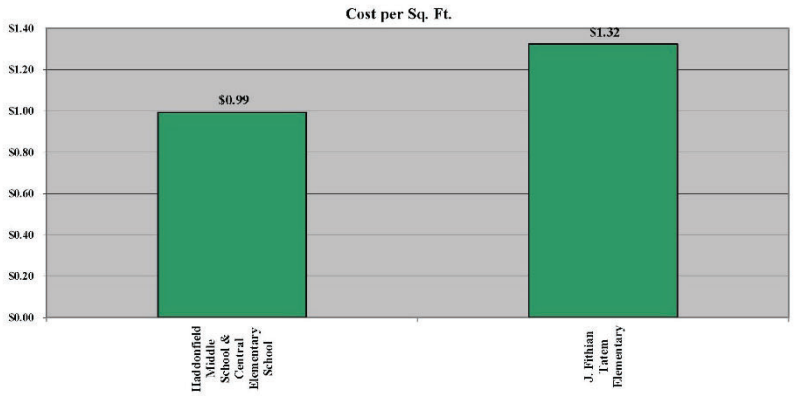
Actual Cost by Utility
Jan 2022 to Dec 2022

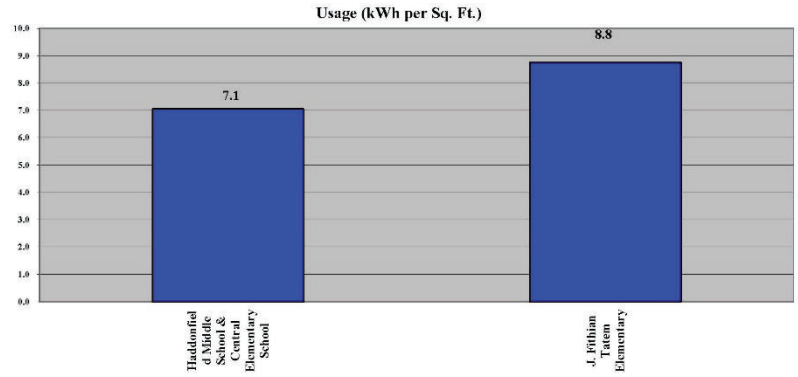


Total Cost
$721,417

Utility Analysis
Electric

Square Footage Analysis

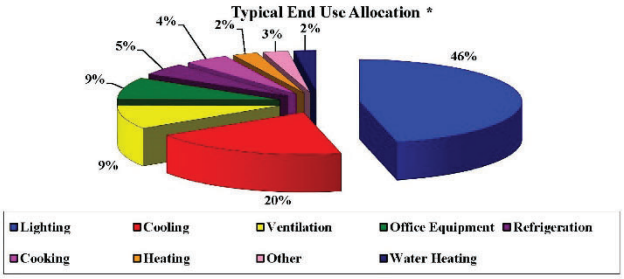




Note: Average kWh/SF for School buildings in this climate zone is 9.0

Electric

Sources of Electric Consumption

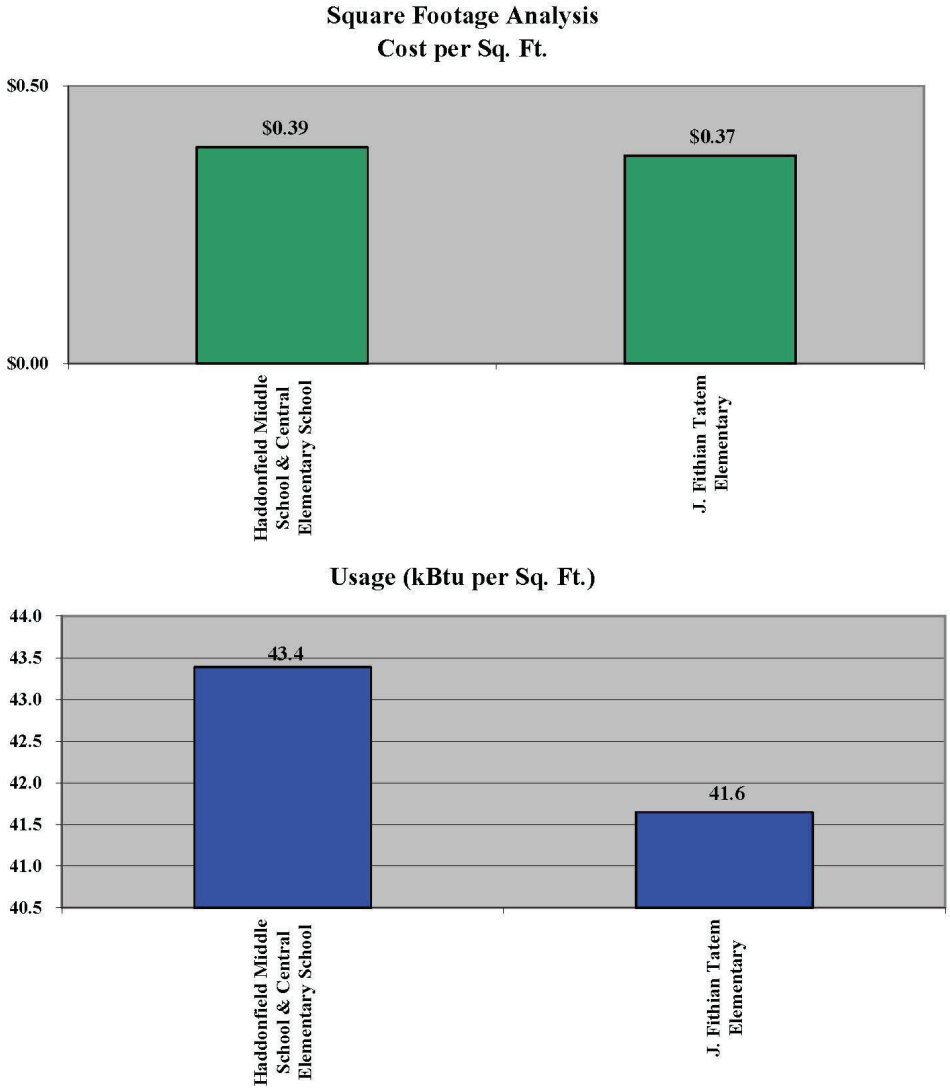


**This allocation is generic and is not a representation of the actual end use in your buildings included in this report.

Typical Allocation Applied to Your Electric Cost**

Lighting	$221,900
Cooling	$93,936
Ventilation	$44,092
Office Equipment	$41,217
Refrigeration	$22,525
Cooking	$21,088
Heating	$11,982
Other	$11,982
Water Heating	$10,544
Your Total Cost Jan 2022 to Dec 2022	**$479,265**

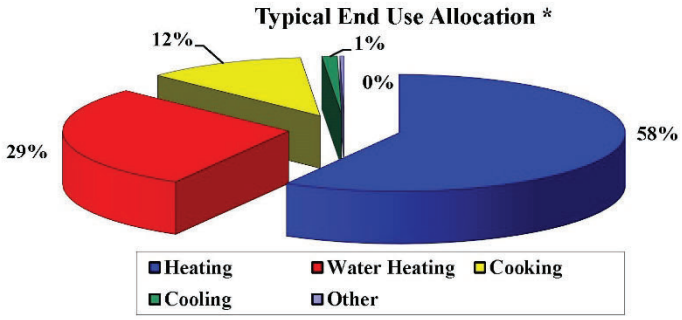
Utility Analysis
Natural Gas



Note: Average kBTU/SF for School buildings in this climate zone is 46.1

Utility Analysis
Natural Gas

Sources of Usage
Natural Gas



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

Typical Allocation Applied to Your Cost**
Natural Gas

Heating	$141,175
Water Heating	$69,982
Cooking	$27,605
Cooling	$2,664
Other	$726
Your Total Cost Jan 2022 to Dec 2022	**$242,152**

Annual Emissions & Environmental Impact

Haddonfield SD

Jan 2022 to Dec 2022

Based on the US Environmental Protection Agency -
Greenhouse Gas Equivalencies Calculator
http://www.epa.gov/cleanenergy/energy-resources/calculator.html

The following energy usage, cost and pollution have been quantified:

Total Annual Electric usage	3,350,558	kWh
Annual Natural Gas usage	250,421	Therms

Electric Emissions	
0.00070742	$MTeCO_2$ per kWh saved
Natural Gas Emissions	
0.05302541	$MTeCO_2$ per MMBtu saved
Equillivent Cars	
0.214132762	Cars/ 1MTeCO2
Forrested Acres	
1.3063142	Forested Acres Factor/ 1MTeCO2

Annual Greenhouse Gas Emissions (Metric tons of equivalent of CO2)		
eCO2 (Electric)	2,370	MT
eCO2 (Gas)	1,326	MT
Total eCO2	3,696.119	MT

This is equivalent to one of the following:	
794	No. of passenger vehicles - annual greenhouse gas emissions
4828	No. of acres of U.S. forests - carbon sequestered annually

Potential Retrofits

Retrofit Description	Utility/Fuel Type	Common Recommendations for Action
Lighting Retrofit and Motion Sensors	Electric/Natural Gas	Upgrade lighting and lighting controls
De-Stratification Fans	Electric/Natural Gas	Redistribution of Conditioned Air
Boiler Replacement	Natural Gas	Install high efficient, modular, condensing boilers
DHW Boiler/Tank Replacements	Electric/Natural Gas	Higher Efficiency Units
RTU Replacements	Electric/Natural Gas	Higher Efficiency Units
Building Management System Upgrades	Electric/Natural Gas	Reduce equipment run-time and provide better comfort
Building Envelope Improvements	Electric/Natural Gas	Reduce building leakage
Roof Replacements	Electric/Natural Gas	Reduce building leakage
Computer Controllers	Electric	Put computers to sleep when building is unoccupied
Install Premium Efficient Motors/Variable Frequency Drives	Electric	Provide more efficient motors and variable frequency drives
Transformer Replacements	Electric	Provide more efficient transformers with reduced amounts of excess heat to the spaces
Water Thermal Conservation	Natural Gas	Lower water thermal consumption

SECTION C
ENERGY CONSERVATION MEASURES

SECTION C — ENERGY CONSERVATION MEASURES (ECMS)

INTRODUCTION

The information used to develop this section was obtained through the independent energy audit 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 (ECMs) which would provide energy and cost savings the 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 ECMs for your facilities.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
1A LED Lighting Upgrades	▪	▪	▪	▪
1B Stadium Lighting			▪	
1C Destratification Fans with UV Disinfection	▪	▪	▪	▪
2A HVAC Unit Replacements	▪		▪	
2B Domestic Water Heater Replacements	▪	▪		
2C Boiler Replacements	▪	▪	▪	▪
2D Split System Replacements	▪	▪		▪
2E Premium Efficiency Motors and VFDs	▪	▪	▪	▪
2F Chiller Replacements			▪	
2G Cooling Tower Replacement			▪	
2H Boiler Burner Controls	▪	▪	▪	▪
2I Unit ventilator/Condensing Unit Replacements	▪	▪	▪	▪
2J Unit Ventilator Replacements with VRF	▪			
2K Gym Floor Replacements	▪	▪	▪	▪
2L Pipe Insulation	▪	▪	▪	▪
2M Energy Recovery Unit Replacements		▪		
3A Building Management Controls	▪	▪	▪	▪
3B Honeywell Building Sustainability Manager (HBSM)	▪	▪	▪	▪

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
4A Building Envelope Improvements	▪	▪	▪	▪
4B Roof Replacements	▪	▪	▪	▪
5A Cogeneration CHP			▪	
6A Energy Sourcing	▪	▪	▪	▪
6B Virtual Solar – Net Metering	▪	▪	▪	▪
6C Solar PPA	▪	▪	▪	▪
6D Solar PV Purchase	▪	▪	▪	▪

ECM 1A LED Lighting Upgrades

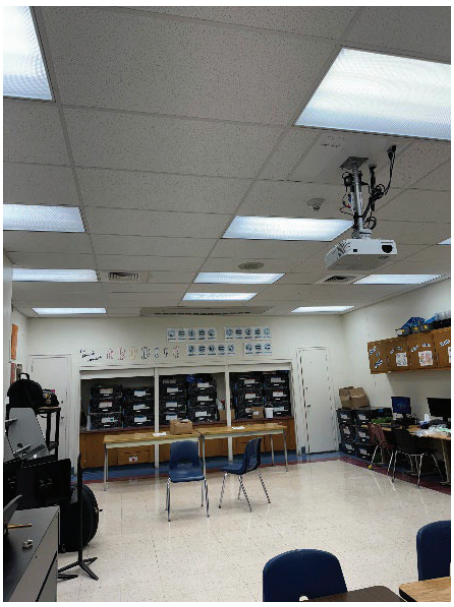
THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Energy savings** from reducing total energy consumption with more efficient, state of the art technology. Today's most efficient way of illumination and lighting has an estimated energy efficiency of 80%-90% when compared to traditional lighting and conventional light bulbs. Lighting controls reduce or eliminate reliance on occupants or staff to turn lights off when spaces are unoccupied by automatically turning lighting fixtures off thereby reducing electrical energy consumption.
- **Improved teacher and student performance** from enhanced lighting quality that translates to an enhanced learning working environment.
- **Improved equipment longevity** by reducing amount of light usage and extending the useful life of your lighting system. LED bulbs and diodes have an outstanding operational lifetime expectation of up to 100,000 hours. This is 11 years of continuous operation, or 22 years of 50% operation. Operational savings in terms of bulb and ballast replacement are significant based on this technology.
- **Reduced maintenance and operational costs** by modernizing your lighting system, reducing the runtime of lighting system and components, and providing for longer lasting and technologically advanced lights, without the need to address deficient or bad ballasts.
- **Ecologically friendly** LED lights are free of toxic chemicals. Most conventional fluorescent lighting bulbs contain a multitude of materials like mercury that are dangerous for the environment. LED lights contain no toxic materials and are 100% recyclable and will help to reduce carbon footprint by up to a third. The long operational lifetime span mentioned above means also that one LED light bulb can save material and production of 25 incandescent light bulbs. A big step towards a greener future!

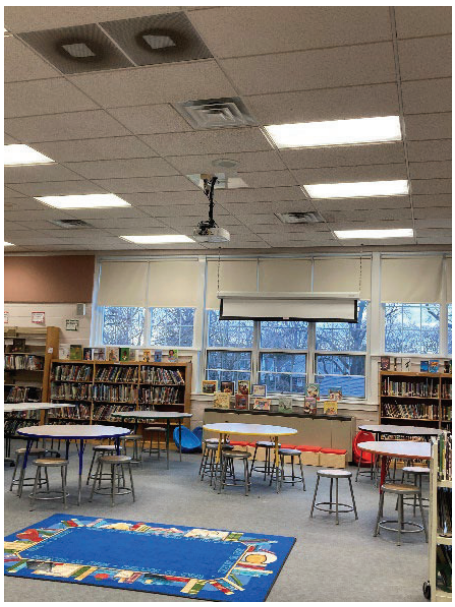
ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
1A LED Lighting Upgrades	▪	▪	▪	▪

EXISTING CONDITIONS

Indoor lighting predominantly consists of T-8 lamps, with a small quantity of T-12 and compact fluorescent lamps (CFLs) along with incandescent bulbs. In general, lighting is operated on switches.



Lighting at Haddonfield Middle School



Lighting at Elizabeth Haddon Elementary School

SCOPE OF WORK

The proposed lighting system is based on the most recent lighting system audit where existing lighting systems were analyzed and inventoried. Honeywell proposes to retrofit all existing T-8 and T-12 fixtures with high efficiency Light Emitting Diode (LED) lamps. The District will receive many benefits from the lighting system upgrade.

CHANGES IN INFRASTRUCTURE

New LED lamps and fixtures will be installed as part of this ECM. Existing poles and shoe box fixtures will be utilized where possible.

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. A slight increase in heating energy is resultant from the reduced heat output of more efficient lamps.
Waste Production	All lamps and ballasts that are removed will be properly disposed.
Environmental Regulations	No environmental impact is expected.

ECM 1B Stadium Lighting

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Energy savings** from reducing total energy consumption with more efficient, state of the art technology. New stadium lighting will reduce energy and maintenance costs over typical high intensity discharge (HID) equipment.
- **Reduced maintenance and operational costs** by reducing the runtime of lighting system and components.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
1B Stadium Lighting			▪	

EXISTING CONDITIONS

Bell Stadium has existing 1650-Watt HID equipment. HID lamps have a lifespan of approximately 2,000 hours. HIDs are responsible for producing glares and do not provide instant light when turned on, they need time to warm-up.

Haddonfield Memorial High School – Stadium Lighting

Haddonfield Memorial High School - Stadium Lighting

PROPOSED SOLUTION

Honeywell proposes the installation of new LED field lighting. The new lighting system can be controlled manually at the field or with wireless communication system, which includes remote programming for up to eight dynamic lighting scenes and user training.

Table 1B.1 Proposed Stadium Lighting

Building	Manufacture	Model	Watts	Qty
Haddonfield Memorial High School	NGU	LUMASPORT 8	680	34
Total				**34**

SCOPE OF WORK

New lighting will be installed. Lower energy cost by adjusting light levels by occupancy, turning lights off when not needed.

CHANGES IN INFRASTRUCTURE

New LED lighting 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	Proper disposal of any waste generated.
Environmental Regulations	No environmental impact is expected.

ECM 1C De-Stratification Fans w/ UV Disinfection

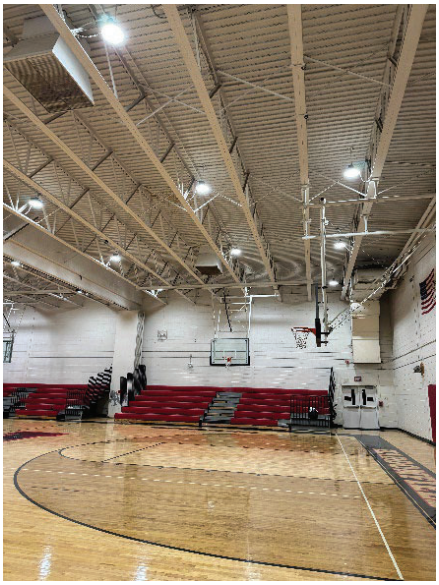
THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Improved efficiency and energy savings** through more equal distribution of conditioned air space.
- **Equipment longevity** due to lower utilization of equipment to condition air.
- **Increased comfort** of students and teachers.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
1C Destratification Fans with UV Disinfection	▪	▪	▪	▪

EXISTING CONDITIONS

Warm air stratifies close to the ceiling in high ceiling areas such as in a gymnasium or auditorium. Elevated levels of heat transfer through the high walls and roof causes elevated heat loss.



Haddonfield Middle School - Gym

Elizabeth Haddon Elementary School - Gym

PROPOSED SOLUTION

In areas with 20+ foot ceiling heights, there is approximately a 15°F+ temperature difference between the floor and the ceiling. With higher ceilings, it is even greater. 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 even out the air temperature to a zero to 3°F differential from floor to ceiling and wall to wall. This will allow HVAC systems to run for a shorter duration 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 forces a column of hotter air from the ceiling 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 and mixes with air near the floor, increasing the temperature and comfort of occupants. Through a natural law of physics, this torus will continue to re-circulate air, 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.

Airius PureAir Series is an air purification and airflow circulation fan system, incorporating the latest in PHI (Photohydroionization) Cell technology to efficiently and effectively neutralize up to 99% of all harmful germs, bacteria, viruses, mold and other contaminants in any internal environment. The PHI Cell emits ‘Ionized Hydroperoxides’, a naturally occurring cleaning agent, which are circulated throughout spaces via the fan. As the fans continue to circulate internal atmosphere, the PHI circulates its neutralizing Ionized Hydroperoxides, providing 24/7 continuous Air Purification. The PureAir also provides all the features and benefits of the world’s most popular destratification and airflow circulation fan, balancing temperatures, improving comfort, reducing heating and cooling costs and reducing carbon emissions.

Based on preliminary site investigation conducted by our staff, we propose to install the de-stratification fans as indicated in the table below.

Table 1C.1 Proposed De-Stratification Fans

Building	Location	Airius Model	Qty PureAir	Qty AirPear
Haddonfield Memorial High School	A Wing Gym	(3)A-25-SP-STD-120-W (2) A-25-SP-STD-120-W-PHI	3	2
Haddonfield Memorial High School	B Wing Gym	(6)A-25-SP-STD-120-W (6) A-25-SP-STD-120-W-PHI	6	6
Haddonfield Memorial High School	Dance Room	(1)A-25-SP-STD-120-W (1) A-25-SP-STD-120-W-PHI	1	1
Haddonfield Memorial High School	Wrestling	(1)S-25-SP-SH-120-W (2) S-25-SP-SH-120-W-PHI	1	2
Haddonfield Memorial High School	Fitness Center	(1)A-25-SP-STD-120-W (1) A-25-SP-STD-120-W-PHI	1	1
Haddonfield Middle School & Central Elementary School	MPR	(3)A-25-SP-STD-120-W (2) A-25-SP-STD-120-W-PHI	3	2

Building	Location	Airius Model	Qty PureAir	Qty AirPear
Haddonfield Middle School & Central Elementary School	Gym	(3)A-25-SP-STD-120-W (3) A-25-SP-STD-120-W-PHI	3	3
J. Fithian Tatem Elementary	MPR	(2)A-25-SP-STD-120-W (1) A-25-SP-STD-120-W-PHI	2	1
Elizabeth Haddon Elementary School	MPR	(2)A-25-SP-STD-120-W (2) A-25-SP-STD-120-W-PHI	2	2
Total			**22**	**20**

SCOPE OF WORK

Per De-Stratification Fan:

- 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.

EQUIPMENT INFORMATION

Manufacturer and Type	Several quality and cost-effective manufacturers are available. The District and Honeywell 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 de-stratification 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 operation of the fan motors.
Waste Production	Proper disposal of any waste generated.
Environmental Regulations	No environmental impact is expected.

ECM 2A HVAC Unit Upgrades

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced energy usage** from improved efficiency resulting from replacement of older equipment.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2A HVAC Unit Replacements	▪		▪	

EXISTING CONDITIONS

Some Heating, Ventilation, and Air Conditioning Units (HVACs) serving the buildings are inefficient or past their useful lives. Replacing these units with new, high efficiency units will save energy costs over the long term while reducing repair costs that would otherwise have been necessary to keep the old HVACs in operation.

Haddonfield Memorial High School - RTU

Haddonfield Memorial High School - AHU

EXISTING ROOFTOP UNITS TO BE REPLACED

Table 2A.1 Existing HVAC Units

Building	Location Served	Manufacturer	Model	Tons	Qty
Haddonfield Memorial High School	C210	Carrier	50TFF006-A-511--	5.0	1
Haddonfield Memorial High School	Gym B	McQuay	AHY	0.0	2
Haddonfield Memorial High School	Gym A	McQuay	AHY	0.0	2
Haddonfield Middle School & Central Elementary School	Gym	McQuay	AHY	0.0	2

PROPOSED SOLUTION

Honeywell proposes replacing the existing HVAC units in the above table. Existing electrical power supply will be reconnected to the new units. The new units will be equipped with factory-installed microprocessor controls that improve unit efficiency. The units will also communicate with the building management system.

Table 2A.2 Proposed HVAC Units

Building	Location Served	Manufacturer	Model	Tons	Qty
Haddonfield Memorial High School	C210	Daikin	MPS-A05CYC	5.0	1
Haddonfield Memorial High School	Gym B	Daikin	AHU HHW/CHW Coils CAH038GDAM	30	2
Haddonfield Memorial High School	Gym A	Daikin	AHU HHW/CHW Coils CAH023GDBM	15	2
Haddonfield Middle School & Central Elementary School	Gym	Daikin	Convert to RTU MPS-H20CGC	20	2

SCOPE OF WORK

The following outlines the scope of work to install the HVAC units stated in the above table:

1. Disconnect existing electric connections.
2. Disconnect piping and air ducts from the unit.
3. Remove unit from the base.
4. Modify base for new unit if necessary.
5. Rig and set new unit at the base.
6. Inspect piping and air ducts before reconnecting them to the unit.
7. Reconnect piping and air ducts.
8. Repair duct and piping insulation.
9. Connect electric power.
10. Start up and commissioning of new unit.
11. Maintenance operator(s) training.

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 savings	*= Existing unit energy consumption (kWh) – replacement unit energy consumption (kWh)*

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 units will be installed in itemized locations; in addition, training for maintenance personnel will be required, as well as on-going, annual preventive maintenance.

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.
Waste Production	Existing unit scheduled for removal will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 2B Domestic Hot Water Heater Replacement

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced energy usage** from improved efficiency resulting from replacement of older equipment.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2B Domestic Water Heater Replacements	▪	▪		

EXISTING CONDITIONS

Existing Domestic Hot Water (DHW) heater has past the end of its useful life.

Haddonfield Middle School – Water Heater

J. Fithian Tatem Elementary – Water Heater

EXISTING HOT WATER HEATER TO BE REPLACED

Table 2B.1 Existing Hot Water Heaters

Building	Manufacturer	Model	Output (MBH)	Storage	Fuel	Qty
J. Fithian Tatem Elementary	Lochinvar	EWN250PM	250	-	NG	1
Haddonfield Middle School & Central Elementary School	AO Smith	BTR 400A 114	390	100	NG	1

PROPOSED SOLUTION

Honeywell proposes replacing the existing DHW heater at the above locations with highly efficient condensing DHW heaters. New condensing DHW heaters have efficiencies between 97% - 98%. They provide better control with capabilities as night setback, temperature adjustments and demand control hot water.

Table 2B.2 Proposed Hot Water Heaters

Building	Manufacturer	Model	Output (MBH)	Storage	Fuel	Qty
J. Fithian Tatem Elementary	AO Smith	BTH250	250	100	NG	1
Haddonfield Middle School & Central Elementary School	AO Smith	BTH400A	399	119	NG	1

SCOPE OF WORK

The following outlines the Domestic Hot Water Heater replacement:

1. Demolish and remove old water heaters.
2. Furnish and install condensing gas fired domestic hot water heaters as specified in the table above.
3. Install all required piping, controls, and breeching as needed.
4. Install mixing valve.
5. Install circulators where needed for building use and kitchen supply.
6. Test and commission.

ENERGY SAVINGS METHODOLOGY AND RESULTS

The savings are calculated from the domestic hot water heater efficiency differences.

Existing Efficiency	*= Existing Efficiency + Existing Heat Exchanger Efficiency*
Proposed Efficiency	*= Efficiency of the New Domestic Hot Water Heater*
Energy Savings $	*= DHW Load x (Existing Equipment Efficiency – New Equipment Efficiency)*

EQUIPMENT INFORMATION

Manufacturer and Type	Several quality and cost-effective manufacturers are available.
Equipment Identification	As part of the measure design and approval process, specific product selection will be provided for your review and approval.

CHANGES IN INFRASTRUCTURE

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

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 improved thermal efficiency.
Waste Production	Proper disposal of any waste generated.
Environmental Regulations	No environmental impact is expected.

ECM 2C Boiler Replacements

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced energy usage** from improved boiler efficiency resulting from replacement of older equipment, and in certain instances, oversized boilers.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2C Boiler Replacements	▪	▪	▪	▪

EXISTING CONDITIONS

Some boilers within the School District are near or past the end of their useful life and are less efficient compared to new boilers. These boilers can be replaced with high efficiency condensing boilers.

Haddonfield Middle School - Boilers

Haddonfield Memorial High School - Boilers

EXISTING BOILERS TO BE REPLACED

Table 2C.1 Existing Boilers

Building	Type	Manufacturer	Model	Output (MBH)	Fuel	Qty
Haddonfield Middle School & Central Elementary School	Hot Water	HB Smith	450 Mills -16	3,948	NG	2

Building	Type	Manufacturer	Model	Output (MBH)	Fuel	Qty
J. Fithian Tatem Elementary	Hot Water	Weil McLain	H-788-WS	1,639	NG	2
Haddonfield Memorial High School	Hot Water	HB Smith	450 Mills-22	5,435	NG	2
Elizabeth Haddon Elementary School	Hot Water	Weil McLain	1288	2,927	NG	2

PROPOSED SOLUTION

It is recommended that the boilers listed in the table above be replaced with boilers operating at higher efficiency as provided in table below. New condensing hot water boilers have thermal efficiencies that range from 88% – 95% depending on the return hot water temperature from the heating loop. With proper design, it is typical to see thermal efficiencies of around 92%. Thermal efficiency is only one part of the equation that makes up the seasonal efficiency of a boiler.

New boiler sizes and quantities will be based on the heat load of the building with redundancy, taking into account the existing system sizing and level of redundancy.

Table 2C.2 Proposed Boilers

Building	Type	Manufacturer	Model	Qty	Capacity (MBH)	Fuel
Haddonfield Middle School & Central Elementary School	Hot Water	Fulton	EDR-2000	2,000	NG	3
J. Fithian Tatem Elementary	Hot Water	Fulton	EDR-750	750	NG	3
Haddonfield Memorial High School	Hot Water	Fulton	EDR-2500	2,500	NG	3
Elizabeth Haddon Elementary School	Hot Water	Fulton	EDR-750	750	NG	3

SCOPE OF WORK

The following outlines the boiler replacement:

1. Disconnect gas back to shutoff valve and electric back to source panelboard.
2. Remove existing boilers.
3. Install new boilers.
4. Connect gas and heating hot water appurtenances to new boilers.
5. Terminate and power new boiler electric circuiting.
6. Start up, commissioning, and operator 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. The District and Honeywell 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 boilers will be installed in itemized locations; in addition, training for maintenance personnel will be required, as well as on-going, annual preventive maintenance.

O&M IMPACT

The new boilers will decrease the O&M cost 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	Annual savings will result from greater combustion efficiency, reduced maintenance costs, and better control and setback.
Waste Production	Existing boilers scheduled for removal will be disposed of properly.
Environmental Regulations	No environmental impact is expected; all regulations will be adhered to in accordance with EPA and local code requirements.

ECM 2D Split System Replacements

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced energy usage** from improved unit efficiency resulting from replacement of older equipment, and in certain instances, oversized units.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2D Split System Replacements	▪	▪		▪

EXISTING CONDITIONS

Honeywell identified some split systems as being inefficient and having exceeded their useful service life. Replacing old units with new, high efficiency units will save energy costs over the long term, while reducing repair costs that would otherwise have been necessary to keep the old units in operation.

Haddonfield Middle School – Split System

J. Fithian Tatem Elementary School – Split System

EXISTING SPLIT SYSTEMS TO BE REPLACED

Table 2D.1 Existing Split Systems

Building	Area Served	Manufacturer	Model	Tons	Qty
Haddonfield Middle School & Central Elementary School	Auditorium	McQuay	ACZ025ACS12-ER11	25.0	1
Haddonfield Middle School & Central Elementary School	Auditorium	McQuay	ACZ025ACS12-ER11	25.0	1
Haddonfield Middle School & Central Elementary School	Central Kitchen	Lennox	HS29-240-2Y	20.0	1
Haddonfield Middle School & Central Elementary School	APR	Lennox	HS29-180-2Y	15.0	1
Haddonfield Middle School & Central Elementary School	APR	Lennox	HS29-180-2Y	15.0	1
J. Fithian Tatem Elementary	APR	McQuay	ACZ013AC12-ER11	13.0	1
J. Fithian Tatem Elementary	APR	McQuay	ACZ013AC12-ER11	13.0	1
Elizabeth Haddon Elementary School	Library	Lennox	HS29-090-2Y	7.5	1
Haddonfield Middle School & Central Elementary School	Rm 295, 293	Lennox	HS29-090-2Y	7.5	1
Haddonfield Middle School & Central Elementary School	Media Center	Lennox	HS29-072-2Y	6.3	1
Haddonfield Middle School & Central Elementary School	Media Center	Lennox	HS29-072-1Y	6.3	1
Elizabeth Haddon Elementary School	Computer	Lennox	HS26-042-3P	3.5	1

PROPOSED SOLUTION

Honeywell proposes replacing both the existing condensing units and air handling units in the table above with new units. The new units will be installed in the same location as the existing units. Existing electrical power supply will be reconnected to the new motors. The new units will be equipped with factory-installed microprocessor controls that improve unit efficiency. The units will also communicate with the existing or enhanced BMS.

Table 2D.2 Proposed Split Systems

Building	Area Served	Manufacturer	Model	Tons	Qty
Haddonfield Middle School & Central Elementary School	Auditorium	Daikin	RCS025D / BCHU1001	25.0	1
Haddonfield Middle School & Central Elementary School	Auditorium	Daikin	RCS025D / BCHU1001	25.0	1
Haddonfield Middle School & Central Elementary School	Kitchen	Lennox	EL240XCSDT-230-3 / 5EJ1004B	20.0	1
Haddonfield Middle School & Central Elementary School	MPR	Lennox	EL180XCSDT-230-3 / 5EJ1004B	15.0	1
Haddonfield Middle School & Central Elementary School	MPR	Lennox	EL180XCSDT-230-3 / 5EJ1004B	15.0	1
J. Fithian Tatem Elementary	APR	Daikin	Convert to RTU MPS-H12CGC	12.0	1

Building	Area Served	Manufacturer	Model	Tons	Qty
J. Fithian Tatem Elementary	APR	Daikin	Convert to RTU MPS-H12CGC	12.0	1
Elizabeth Haddon Elementary School	Library	Lennox	EL090XCSST-230-3 / EL090XASD-STD-230	7.5	1
Haddonfield Middle School & Central Elementary School	Rm 295, 293	Lennox	EL090XCSST-230-3 / EL090XASD-STD-230	7.5	1
Haddonfield Middle School & Central Elementary School	Media Center	Lennox	EL072XCSST-230-3 / EL072XASS-STD-230	6.0	1
Haddonfield Middle School & Central Elementary School	Media Center	Lennox	EL072XCSST-230-3 / EL072XASS-STD-230	6.0	1
Elizabeth Haddon Elementary School	Computer	Lennox	TSA042H4-230 / CBA25UH-042	3.5	1

SCOPE OF WORK

The following outlines the scope of work to install the condensing units listed in the Proposed Split Systems table above.

1. Disconnect existing electric connections.
2. Disconnect piping from the unit.
3. Remove unit from the base.
4. Modify base for new unit if necessary.
5. Rig and set new unit at the base.
6. Inspect piping and air ducts before reconnecting them to the unit.
7. Reconnect piping and air ducts.
8. Repair duct and piping insulation.
9. Connect electric power.
10. Start up and commissioning of new unit.
11. Maintenance operator(s) training.

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 savings	*= Existing unit energy consumption (kWh) – replacement unit energy consumption (kWh)*

EQUIPMENT INFORMATION

Manufacturer and Type	Several quality and cost-effective manufacturers are available. The District and Honeywell 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 split systems will be installed in itemized locations; in addition, training for maintenance personnel will be required, as well as on-going, annual preventive maintenance.

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.
Waste Production	Existing condensing units scheduled for removal will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 2E Premium Efficiency Motors, Pumps and VFDs

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Energy savings** from reduced run hours and reduced motor speeds.
- **Equipment longevity** due to more efficient and less wasteful equipment utilization and reduced startup wear.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2E Premium Efficiency Motors and VFDs	▪	▪	▪	▪

EXISTING CONDITIONS

Honeywell has identified standard efficiency electric motors on several pumps. Energy savings can be obtained by replacing the standard efficiency motors with premium efficiency motors as well as by installing VFDs on systems that have two-way control valves.

Haddonfield Memorial High School – Motor

Haddonfield Middle School – Motor

EXISTING MOTORS TO BE REPLACED

Table 2E.1 Existing Motors

Building	Type	Qty	Motor HP	Existing Efficiency	Add VFD
Haddonfield Memorial High School	CHW	2	40.0	93.0%	Y
J. Fithian Tatem Elementary	HW	2	10.0	86.5%	Y

Building	Type	Qty	Motor HP	Existing Efficiency	Add VFD
Haddonfield Memorial High School	HW Main	1	10.0	86.5%	Y
Haddonfield Memorial High School	HW Main	1	10.0	91.7%	Y
Haddonfield Memorial High School	HW C Wing P9	1	10.0	86.5%	Y
Haddonfield Memorial High School	HW C Wing P10	1	10.0	91.7%	Y
Haddonfield Middle School & Central Elementary School	ES HW Pump	2	7.5	88.5%	Y
Haddonfield Middle School & Central Elementary School	MS HW Pump	2	7.5	91.0%	Y
Haddonfield Memorial High School	HW B Wing P8	1	7.5	91.0%	Y
J. Fithian Tatem Elementary	HW	2	3.0	87.5%	Y
Haddonfield Memorial High School	HW A Wing P5	1	3.0	81.5%	Y
Haddonfield Memorial High School	HW A Wing P6	1	3.0	89.5%	Y
Haddonfield Memorial High School	HW AUD P7	1	0.8	81.5%	N
Elizabeth Haddon Elementary School	HW	2	3.0	86.5%	Y
Elizabeth Haddon Elementary School	HW Booster Pump	5	1.0	85.5%	N
Elizabeth Haddon Elementary School	HW	5	3.0	89.5%	Y

PROPOSED SOLUTION

Honeywell observed that several motors and pumps that are sized to meet peak heating or cooling conditions. However, we've learned that most operating hours occur during conditions that require less than peak loads.

Honeywell proposes replacement of all above-mentioned single speed standard efficiency motors (that do not have VFDs) with new premium efficiency motors and installing new couplings where applicable. In addition, Honeywell recommends installing VFDs on these pumps. Energy used by the motor can be reduced by varying the flow in response to varying loads in the space. Motor speed may be controlled either based on the pressure in the distribution system or based on time of day.

Honeywell recommends fitting unit ventilators with two-way valves (provided that unit ventilators located at end of piping branches are fitted with three-way valves to keep hot water moving through the distribution piping at all times).

Honeywell also recommends installing VFDs on the heating hot water pumps and chilled water pumps to better match pumping output to system requirements and reduce energy waste. Each motor will be equipped with new selector relays that will allow one drive to operate per pump with the VFD drive.

Honeywell also recommends installation of new differential pressure sensors and tying them to the control system to allow you to regulate the speed of the pump per load requirements. Lastly, we recommend installation of VFDs on the cooling system pump motors that have higher horsepower. VFDs will maintain temperatures in the unit by adjusting the speed of both the motor and the pump and can be connected to your BMS.

ENERGY SAVINGS METHODOLOGY AND RESULTS

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

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 2F Chiller Replacements

THE KEY BENEFITS OF THIS ECM INCLUDE:

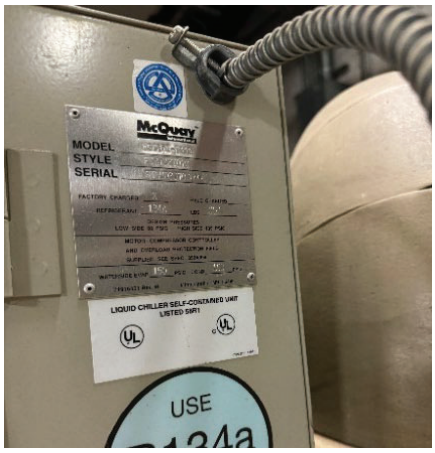
- **Reduced energy usage** from improved efficiency due to replacement of older equipment.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2F Chiller Replacements			▪	

EXISTING CONDITIONS

Chiller serving the Memorial High School is near the end of its useful life and is costly to maintain. Replacing with new, high efficiency unit will save energy costs over the long term while reducing repair costs that would otherwise have been necessary to keep the old units in operation.

Haddonfield Memorial High School - Chiller



Haddonfield Memorial High School – Chiller

EXISTING CHILLER UNITS

Table 2F.1 - Existing Chillers

Building	Location Served	Manufacturer	Model	Tons	Qty
Haddonfield Memorial High School	Building	McQuay	WSC079-CAAA	300.0	1

PROPOSED SOLUTION

Honeywell proposes replacing the existing chillers in the table above. Existing electrical power supply will be reconnected to the new units. The unit will communicate with the existing or enhanced BMS.

Table 2F.2 – Proposed Air-Cooled Chillers

Building	Location Served	Manufacturer	Model	Tons	Qty
Haddonfield Memorial High School	Building	Daikin	AWV022B	300.0	1

Table 2F.3 – Alternate New Water-Cooled Chillers

Building	Location Served	Manufacturer	Model	Tons	Qty
Haddonfield Memorial High School	Building	Daikin	WSC079LBAZA	300.0	1

SCOPE OF WORK

The following outlines the scope of work to install the chiller unit listed in the table above.

1. Disconnect existing electric connections.
2. Disconnect piping from the unit.
3. Remove existing unit.
4. Rig and set new unit.
5. Inspect piping before reconnecting them to the unit.
6. Reconnect piping.
7. Repair piping insulation.
8. Connect electric power.
9. Start up and commissioning of new unit.
10. Maintenance operator(s) training.

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 savings	*= Existing unit energy consumption (kWh) – replacement unit energy consumption (kWh)*

EQUIPMENT INFORMATION

Manufacturer and Type	Several quality and cost-effective manufacturers are available.
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 chillers will be installed in itemized locations; in addition, training for maintenance personnel will be required, as well as on-going, annual preventive maintenance.

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.
Waste Production	Existing units scheduled for removal will be disposed of properly.

Environmental Regulations	No environmental impact is expected.

ECM 2G Cooling Tower Replacements

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced energy usage** from improved efficiency due to replacement of older equipment.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2G Cooling Tower Replacement			▪	

EXISTING CONDITIONS

Cooling tower units serving the building has gone beyond its useful life and is inefficient, have exceeded their expected useful service lives, and are costly to maintain. Replacing this with new, high efficiency unit will save energy costs over the long term while reducing repair costs that would otherwise have been necessary to keep the old units in operation.

Haddonfield Memorial High School - Cooling Tower

Haddonfield Memorial High School – Cooling Tower

EXISTING COOLING TOWER

Table 2G.1 - Existing Cooling Tower

Building	Location Served	Manufacturer	Model	Tons	Qty
Haddonfield Memorial High School	Building	Marley	AV65031G	311	1

PROPOSED SOLUTION

Honeywell proposes replacing the existing cooling tower unit in the table above. The new unit will be installed in the same location as the existing units. Existing electrical power supply will be reconnected to the new motors. The units will communicate with the existing or enhanced BMS.

Table 2G.2 – Proposed Cooling Tower

Building	Location Served	Manufacturer	Model	Tons	Qty
Haddonfield Memorial High School	Building	Marley	AV65031G	291	1

SCOPE OF WORK

The following outlines the scope of work to install the Cooling Tower unit listed in the table above.

1. Disconnect existing electric connections.
2. Disconnect piping from the unit.
3. Remove existing unit.
4. Rig and set new unit.
5. Inspect piping before reconnecting them to the unit.
6. Reconnect piping.
7. Repair piping insulation.
8. Connect electric power.
9. Start up and commissioning of new unit.
10. Maintenance operator(s) training.

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 savings	*= Existing unit energy consumption (kW/ton) – replacement unit energy consumption (kW/ton)*

EQUIPMENT INFORMATION

Manufacturer and Type	Several quality and cost-effective manufacturers are available.
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 Cooling Tower will be installed in itemized locations; in addition, training for maintenance personnel will be required, as well as on-going, annual preventive maintenance.

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.
Waste Production	Existing units scheduled for removal will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 2H Boiler Burner Controls

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced energy usage** from improved boiler efficiency resulting from replacement of older equipment, and in certain instances, oversized boilers.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2H Boiler Burner Controls	▪	▪	▪	▪

EXISTING CONDITIONS

Honeywell has identified some boiler burners are the best candidates for burner replacements and controls.

Elizabeth Haddon Elementary School – Burners

Haddonfield Middle School – Burners

EXISTING BURNERS TO BE REPLACED

Table 2H.1 Existing Burners

Building	Make	Model	MBH	Qty
Haddonfield Middle School & Central Elementary School	Power Flame	LNIC4-G-25	4,935	2
J. Fithian Tatem Elementary	Power Flame	CR2-G-20A	2,049	2
Haddonfield Memorial High School	Power Flame	LNIC5-G-30	6,968	2
Elizabeth Haddon Elementary School	Power Flame	CR3-G-25	3,753	2

PROPOSED SOLUTION

Typically, boilers are sized to accommodate the coldest days (approximately 5% of the year). During these periods of maximum demand, the burner is constantly on and operating at maximum capacity. 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 building's heating requirements, including occupancy, climate, wind chill, solar gain, type of building, and many others.

Proposed Systems And Scope Of Work

Honeywell will replace the burners on the boilers listed above with new, natural gas-fired burners, utilizing advanced controls.

Honeywell Slate™

SLATE™ from Honeywell brings together configurable safety and programmable logic for the first time ever. It's one platform from one vendor that can easily be customized for almost any application – in less time with less complexity.

This upgrade 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 to achieve maximum efficiency.

Modulating Burner Control

The Modulating Burner integrates flame safeguard control, fuel-air ratio control, O2 Trim, VFD control, and proportional integral derivative (PID) control into a single, integrated, user-friendly system.

The features integrated into the burner provide energy savings, reduced emissions, reduced installation costs and enhanced safety.

Fuel Metering

- Reduced fuel use.
- Increased burner efficiency.
- Greenhouse gas emissions reduction.

Easy Access Panels

- Total access to components.
- Easy maintenance.

Graphic Burner Management System

- Graphic annunciation of critical burner functions.

SCOPE OF WORK

The following outlines the boiler burner controls:

1. Disconnect electrical and gas from existing boiler burner.
2. Install new burner controls on existing burner (where applicable).
3. Start up, commissioning and operator 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)*

CHANGES IN INFRASTRUCTURE

New combustion controls will be installed and programmed in the locations listed above; in addition, training for maintenance personnel will be required as well as on-going, annual preventive maintenance.

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 boiler load control, reduced maintenance costs control and setback.
Waste Production	Existing equipment scheduled for removal will be disposed of properly.
Environmental Regulations	No environmental impact is expected; all regulations will be adhered to in accordance with EPA and local code requirements.

ECM 2I Unit ventilator/Condensing Unit Replacements

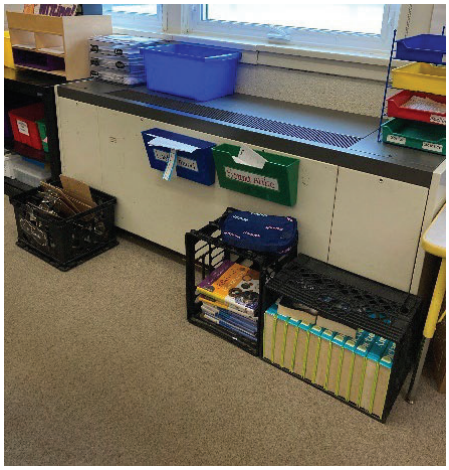
THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced energy usage** from improved efficiency resulting from replacement of older equipment.
- **Lower operational costs** through less frequent maintenance and operational issues.

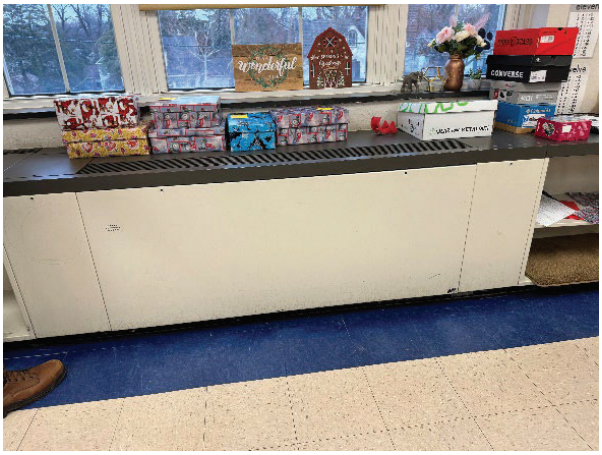
ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2I Unit ventilator/Condensing Unit Replacements	▪	▪	▪	▪

EXISTING CONDITIONS

Honeywell observed that some of the existing unit ventilators are beyond the useful life and being inoperable or unrepairable.



Elizabeth Haddon Elementary School – Unit Ventilator



Haddonfield Middle School – Unit Ventilator

Table 2I.1 – Existing Unit Ventilators

Building	Type	Location	Make	Model	Qty
Haddonfield Middle School & Central Elementary School	HW	Classrooms	AAF	UAVS	43
J. Fithian Tatem Elementary	HW	Classrooms	AAF	UAVS	31
Haddonfield Memorial High School	HW	Classrooms	AAF	UAVS	45
Elizabeth Haddon Elementary School	HW	Classrooms	AAF	UAVS	25

PROPOSED SOLUTION

Honeywell proposes to replace existing unit ventilators and condensing units with new units. New units will be equipped with open protocol factory mounted controls which can be tied into existing BMS system.

Table 2I.1 – Proposed Unit Ventilators

Building	Type	Location	Make	Model	Qty
Haddonfield Middle School & Central Elementary School	HW	Classrooms	Daikin	UAVS	43
J. Fithian Tatem Elementary	HW	Classrooms	Daikin	UAVS	31
Haddonfield Memorial High School	HW	Classrooms	Daikin	UAVS	45
Elizabeth Haddon Elementary School	HW	Classrooms	Daikin	UAVS	25

SCOPE OF WORK

The following outlines the unit ventilator replacements:

- Disconnect electrical and steam from existing units.
- Install new unit vents and reconnect, steam and electric.
- Start up, commissioning and operator training

ENERGY SAVINGS METHODOLOGY AND RESULTS

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

Existing Univent Efficiency	*= Heat Input x Existing Efficiency*
Proposed Univent Efficiency	*= Heat Input x New Efficiency*
Energy Savings $	*= Heating Production (Proposed Efficiency – Existing Efficiency)*

EQUIPMENT INFORMATION

Manufacturer and Type	Several quality and cost-effective manufacturers are available. The District and Honeywell 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 unit ventilators will be installed and programmed in the locations listed above; in addition, training for maintenance personnel will be required as well as on-going, annual preventive maintenance.

O&M IMPACT

The new unit ventilators will decrease the O&M cost for maintaining the equipment .

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	Minor support will be required for the interruption of utilities for brief tie-in periods. Continuity of service must be maintained for the customer.
Waste Production	Existing units scheduled for removal will be disposed of properly.

Environmental Regulations	Minor support will be required for the interruption of utilities for brief tie-in periods. Continuity of service must be maintained for the customer.

ECM 2J Unit Ventilator Replacements with VRF

THE KEY BENEFITS OF THIS ECM INCLUDE:

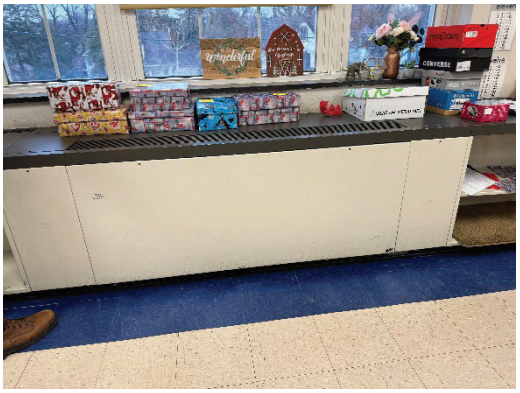
- **Reduced energy usage** from improved efficiency resulting from replacement of older equipment.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2J Unit Ventilator Replacements with VRF	▪			

EXISTING CONDITIONS

Honeywell observed that some of the existing unit ventilators with outdoor condensing units are beyond the useful life and being inoperable or unrepairable.

Haddonfield Middle School – Unit Ventilator



Haddonfield Middle School – Unit Ventilator

PROPOSED SOLUTION

Honeywell proposes to replace existing unit ventilators with new VRF systems. New units will be equipped with open protocol factory mounted controls which can be tied into existing BMS system.

Table 2J.1 – Proposed VRF System

Building	Type	Location	Make	Model	Qty
Haddonfield MS & Central ES	VRF	10	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	18	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	20	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	30	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	53	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	57	Daikin	UAVR-----/VRV-H	1

Building	Type	Location	Make	Model	Qty
Haddonfield MS & Central ES	VRF	81	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	102	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	104	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	106	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	108	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	110	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	112	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	151	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	161	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	165	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	167	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	171	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	177	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	202	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	204	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	206	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	208	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	210	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	212	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	214	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	216	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	218	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	220	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	253	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	257	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	259	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	261	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	263	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	265	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	267	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	271	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	279	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	283	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	291	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	251	Daikin	UAVR-----/VRV-H	1
Haddonfield MS & Central ES	VRF	191	Daikin	UAVR-----/VRV-H	1

SCOPE OF WORK

The following outlines the unit ventilator replacements:

1. Disconnect electrical and steam from existing units.
2. Install new unit vents and reconnect, steam and electric.
3. Start up, commissioning and operator training

ENERGY SAVINGS METHODOLOGY AND RESULTS

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

Existing Univent Efficiency	*= Heat Input x Existing Efficiency*
Proposed Univent Efficiency	*= Heat Input x New Efficiency*
Energy Savings $	*= Heating Production (Proposed Efficiency – Existing Efficiency)*

EQUIPMENT INFORMATION

Manufacturer and Type	Several quality and cost-effective manufacturers are available. The District and Honeywell 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 unit ventilators will be installed and programmed in the locations listed above; in addition, training for maintenance personnel will be required as well as on-going, annual preventive maintenance.

O&M IMPACT

The new unit ventilators will decrease the O&M cost for maintaining the equipment .

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	Minor support will be required for the interruption of utilities for brief tie-in periods. Continuity of service must be maintained for the customer.
Waste Production	Existing units scheduled for removal will be disposed of properly.
Environmental Regulations	Minor support will be required for the interruption of utilities for brief tie-in periods. Continuity of service must be maintained for the customer.

ECM 2K Gym Floor Replacements

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Improve Air Quality** by optimizing the amount of fresh air supply to create a healthier building environment.
- **Operational efficiency** resulting from more precise control and reduced outside air intake.
- **Energy Savings** from reducing total energy consumption with more efficient, state of the art technology.
- **Equipment longevity** due to more efficient and less wasteful equipment utilization.
- **Occupancy comfort and productivity** by way of enhanced temperature and humidity control throughout your buildings.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2K Gym Floor Replacements	▪	▪	▪	▪

EXISTING CONDITIONS

HVAC equipment serving the all-purpose room and gym at schools are operated to supply outside air to the spaces continually to minimize the impact on indoor air quality from the mercury containing flooring. Most of the time these spaces are not fully occupied, which increase energy demand for heating and cooling of excessive amount of outside air.

J. Fithian Tatem Elementary School - APR

Elizabeth Haddon Elementary School – APR

PROPOSED SOLUTION

Honeywell proposes removing and replacing the flooring in these spaces. HVAC equipment serving these spaces are operated to supply outside air only when the spaces are occupied. The required outside air is supplied and heated to meet the minimum outdoor air requirements. This control strategy will reduce the amount of outside air intake and thus reduce the heating energy used by the HVAC units and electric energy used by the motors. Based on this fact, there are reduced requirements for outside air to the spaces.

Table 2K.1 Existing Floor to Be Replaced

Building	Area Served	Area (sq. ft.)	Number of HVAC Units
Haddonfield Middle School & Central Elementary School	All Purpose Room	5,100.0	2
J. Fithian Tatem Elementary	All Purpose Room	3,500.0	2
Haddonfield Memorial High School	A Wing Gym	5,680.0	2
Haddonfield Memorial High School	B Wing Gym	13,500.0	1
Elizabeth Haddon Elementary School	All Purpose Room	4,284.0	1

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 Operating Hours*
	= Reduced BTU x Cost per BTU
Cost of Proposed Heating/Cooling	*= Existing Costs – Proposed Costs*
Energy Savings $	

The baseline adjustment calculations are included with the energy calculations.

CHANGES IN INFRASTRUCTURE

Flooring will be replaced in these spaces.

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 excess outdoor air.
Waste Production	Any removed parts will be disposed of properly.

ECM 2L Pipe Insulation

THE KEY BENEFITS OF THIS ECM INCLUDE:

- Energy savings from increased equipment efficiency.
- Equipment longevity due to more efficient and less wasteful equipment utilization.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2L Pipe Insulation	▪	▪	▪	▪

EXISTING CONDITIONS

An insulation audit was conducted identifying an approximated quantity of heat that is lost from various locations throughout the buildings. The heat losses result from hot piping giving off heat to the space around it. This measure will insulate these surfaces, resulting in energy savings and improved comfort of those areas in or near occupied spaces.

Haddonfield Memorial High School - Pipe Insulation

J. Fithian Tatem Elementary School - Pipe Insulation

PROPOSED SOLUTION

Honeywell proposes insulating pipes and valves with appropriately sized fiberglass insulation. The following table lists the recommended insulation scope.

Table 2L.1 - Proposed Pipe Insulation Scope

Building	Ball Valve Insulation (Units)	Bonnet Insulation (Units)	Butterfly Valve Insulation (Units)	Check Valve Insulation (Units)	Control Valve Insulation (Units)	End Cap Insulation (Units)	Flange Insulation (Units)	Flex Fitting Insulation (UT)	Flo-Check Insulation (Units)	Gate Valve Insulation (Units)	Globe Valve Insulation (Units)	Pipe Fitting Insulation (Units)	Pipe Reducer Insulation (Units)	Pump Insulation (Units)	Straight Pipe Insulation (LF)	Strainer Insulation (Units)	Suction Diffuser Insulation (Units)	Tank Insulation (Units)	Triple Duty Valve Insulation (Units)
Elizabeth Haddon Elementary School	9		9		1		56	8			7	18		10	48	1	2	1	9
Haddonfield Memorial High School		3	3	1	4	4	44	4		5	3	31	5	6	100	8	1	2	2
Haddonfield Middle & Central Elementary Schools	1	4	2	3		7	46	8		8		12		6	19		2		2
Tatem Elementary School		2	2	4	1		34	4	2	4		2	2	6		2	2		2
Total Quantity	**10**	**9**	**16**	**8**	**6**	**11**	**180**	**24**	**2**	**17**	**10**	**63**	**7**	**28**	**167**	**11**	**7**	**3**	**15**

ENERGY SAVINGS METHODOLOGY AND RESULTS

Energy savings results from significantly reducing the heat lost to the atmosphere from the piping and valve surfaces. In general, Honeywell uses the following approach to determine savings for this specific measure:

Energy savings	*=Heat Loss Rate per foot of Uninsulated Pipe – Heat Loss Rate per foot of Insulated Pipe) x (Length of Pipe x Hours of Operation) x Cost/btu)/(Boiler 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

The service to the specific lines may require interruption to allow for the repair or replacement. Coordination with site personnel will be required to minimize interruption to the buildings affected.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

Coordination of the electrical tie-in will be required.

ENVIRONMENTAL ISSUES

Resource Use	Energy savings will result the reduction of heat loss from uninsulated lines resulting in lower fuel consumption. The equipment uses no other resources.
Waste Production	This measure produces no waste by products.
Environmental Regulations	Asbestos abatement may be required

ECM 2M Energy Recovery Unit Replacements

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced energy usage** from improved energy recovery efficiency.
- **Lower operational costs** through less frequent maintenance and operational issues.
- **Increased comfort** of students and teachers.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
2M Energy Recovery Unit Replacements		▪		

EXISTING CONDITIONS

Existing Energy Recovery Units at J. Fithian Tatem Elementary School are not functioning or inefficient. Older units with less heat transfer efficiency from the exhaust air stream to the supply air stream increases energy usage.

J. Fithian Tatem Elementary School - ERU

J. Fithian Tatem Elementary School - ERU

EXISTING ENERGY RECOVERY UNITS TO BE REPLACED

Table 2M.1 Existing ERU for Replacement

Building	Location Served	Manufacturer	Model	Tons	Qty
J. Fithian Tatem Elementary	Hallway	Semco	FV2000V-4RP2AA without preheat	5.0	1
J. Fithian Tatem Elementary	Hallway	Semco	FV2000V-3RP2AA with preheat	5.0	1
J. Fithian Tatem Elementary	Hallway	Semco	FV3000V-4RP2AA without preheat	7.5	1

PROPOSED SOLUTION

It is recommended that the units listed in the table above to be replaced. With higher heat transfer efficiency by the recovery core, more energy can be recovered from return air. This will reduce energy consumption, lower operational costs, and improve occupant comfort.

Table 2M.2 Proposed ERU Units

Building	Location Served	Manufacturer	Model	Tons	Qty
J. Fithian Tatem Elementary	Hallway	Oxygen8	C22OU	5.0	1
J. Fithian Tatem Elementary	Hallway	Oxygen8	C22OU	5.0	1
J. Fithian Tatem Elementary	Hallway	Oxygen8	C32OU	7.5	1

CHANGES IN INFRASTRUCTURE

New Energy Recovery Units will be installed in itemized locations; in addition, training for maintenance personnel will be required, as well as on-going, annual preventive maintenance.

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 higher unit efficiency.
Waste Production	Existing components scheduled for removal will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 3A Building Management Controls

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Improve Air Quality** by more precise control of air filtration, air composition and ultra-violet cleaning to create a healthier school building environment.
- **Operational efficiency** resulting from better control and system wide visibility.
- **Remote operation** of HVAC systems via mobile phone or off-site computer.
- **Energy savings** from reducing total energy consumption with more efficient, state of the art technology.
- **Occupancy comfort and productivity** resulting from enhanced temperature and humidity control throughout your buildings.
- **Deliver a comprehensive open protocol Building Management System.** Verify design is customized for each building yet uniform throughout the district. Assure longevity of control system with proper commissioning and training.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
3A Building Management Controls	▪	▪	▪	▪

ECM OVERVIEW

Honeywell has performed a survey of the existing temperature controls throughout the School District. Upon inspection, it was noted that the level of controls technology varies throughout the District. However, regardless of the systems in place, the building control systems can benefit from upgrades and implementing energy conservation enhancements.

EXISTING CONDITIONS

Table 3A.1 Existing Controls Summary

Building	Existing Controls
District BMS	Niagara Software Expired
Haddonfield Memorial High School	Mixed DDC and Pneumatics
Haddonfield Middle & Central Elementary Schools	Mixed DDC and Pneumatics
Elizabeth Haddon Elementary School	Mixed DDC and Pneumatics

Haddonfield Memorial High School DDC Controls

Tatem Elementary School Sensor

PROPOSED SOLUTION

DISTRICT-WIDE BMS UPGRADES

Provide updated 3-year software maintenance agreement for 5 JACE network controllers and the Niagara Supervisor.

Haddonfield Memorial High School

1. Furnish and install new DDC to replace pneumatic controls associated with the following equipment. furnish & install the necessary engineering, control wiring, programming, commissioning & coordination required to provide new electronic controls for the units below, with all hard-wired points listed below.
    a. 2 H&V Units
        i. Fan SS
        ii. Fan Status
        iii. Space Temp / CO2
        iv. HTG Valve
        v. Reheat Valve
        vi. OAD/RAD
        vii. MAT
        viii. DAT
        ix. Freeze Stat
        x. Provide demand control ventilation.
    b. 8 Unit Ventilators
        i. Fan SS
        ii. Fan Status
        iii. Space Temp / CO2
        iv. HTG Valve
        v. FTR Valve

vi. CHW Valve
vii. OAD/RAD
viii. DAT
ix. Freeze Stat
x. Provide demand control ventilation.

c. 1 Radiator
i. Space Temp
ii. FTR Valve

2. Provide Re-Commissioning of the existing DDC components and perform the following services:
a. Releasing of all control point overrides.
b. Checkout of control points and sequences of operation.
c. Recalibrate CO2 sensors.
d. Replace, repair, or recalibrate sensors found defective or inaccurate up to $10,000.

Haddonfield Middle & Central Elementary Schools

1. Furnish and install new DDC to replace pneumatic controls associated with the following equipment. furnish & install the necessary engineering, control wiring, programming, commissioning & coordination required to provide new electronic controls for the units below, with all hard-wired points listed below.
a. 6 AHUs
i. Fan SS
ii. Fan Status
iii. Space Temp / CO2
iv. HTG Valve
v. DX Enable
vi. OAD/RAD
vii. MAT
viii. DAT
ix. Freeze Stat
x. Provide demand control ventilation.

b. 5 H&V Units
i. Fan SS
ii. Fan Status
iii. Space Temp / CO2
iv. HTG Valve
v. OAD/RAD
vi. MAT
vii. DAT
viii. Freeze Stat
ix. Provide demand control ventilation.

c. 38 Unit Ventilators

i. Fan SS
ii. Fan Status
iii. Space Temp / CO2
iv. HTG Valve
v. CHW Valve
vi. OAD/RAD
vii. DAT
viii. Freeze Stat
ix. Provide demand control ventilation.

d. 4 CUHs
i. Space Temp
ii. FTR Valve
iii. Fan SS
iv. Fan Status

2. Provide Re-Commissioning of the existing DDC components and perform the following services:
a. Releasing of all control point overrides.
b. Checkout of control points and sequences of operation.
c. Recalibrate CO2 sensors.
d. Replace, repair, or recalibrate sensors found defective or inaccurate up to $5,000.

Haddon Elementary School

1. Furnish and install new DDC to replace pneumatic controls associated with the following equipment. furnish & install the necessary engineering, control wiring, programming, commissioning & coordination required to provide new electronic controls for the units below, with all hard-wired points listed below.
a. Nurse H&V Unit
i. Fan SS
ii. Fan Status
iii. Space Temp / CO2 – qty 4
iv. HTG Valve
v. Reheat Valve – qty 4
vi. OAD/RAD
vii. MAT
viii. DAT – qty 4
ix. Freeze Stat
x. Provide demand control ventilation.

b. 11 Unit Ventilators
i. Fan SS
ii. Fan Status
iii. Space Temp / CO2
iv. HTG Valve

v. DX Enable
vi. OAD/RAD
vii. DAT
viii. Freeze Stat
ix. Provide demand control ventilation.

2. Provide Re-Commissioning of the existing DDC components and perform the following services:
   a. Releasing of all control point overrides.
   b. Checkout of control points and sequences of operation.
   c. Recalibrate CO2 sensors.
   d. Replace, repair, or recalibrate sensors found defective or inaccurate up to $5,000.

J. Fithian Tatem Elementary

1. Furnish and install new DDC to replace pneumatic controls associated with the following equipment. furnish & install the necessary engineering, control wiring, programming, commissioning & coordination required to provide new electronic controls for the units below, with all hard-wired points listed below.
   a. 19 Unit Ventilators
      i. Fan SS
      ii. Fan Status
      iii. Space Temp / CO2
      iv. HTG Valve
      v. FTR Valve
      vi. DX Enable
      vii. OAD/RAD
      viii. DAT
      ix. Freeze Stat
      x. Split AC Enable (room 106 only)
      xi. Provide demand control ventilation.
   b. 3 CUHs
      i. Space Temp
      ii. FTR Valve
      iii. Fan SS
      iv. Fan Status
   c. Faculty Room Radiation
      i. Space Temp
      ii. FTR Valve – qty 2
2. Provide Re-Commissioning of the existing DDC components and perform the following services:
   a. Releasing of all control point overrides.
   b. Checkout of control points and sequences of operation.
   c. Recalibrate CO2 sensors.
   d. Replace, repair, or recalibrate sensors found defective or inaccurate up to $5,000.

ENERGY SAVINGS METHODOLOGY AND RESULTS

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

Existing Heating BTU and 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 Operating Hours*
Cost of Proposed Heating/Cooling	*= Reduced BTU x Cost per BTU*
Energy Savings $	*= Existing Costs – Proposed Costs*

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 3B Honeywell Building Sustainability Manager (HBSM)

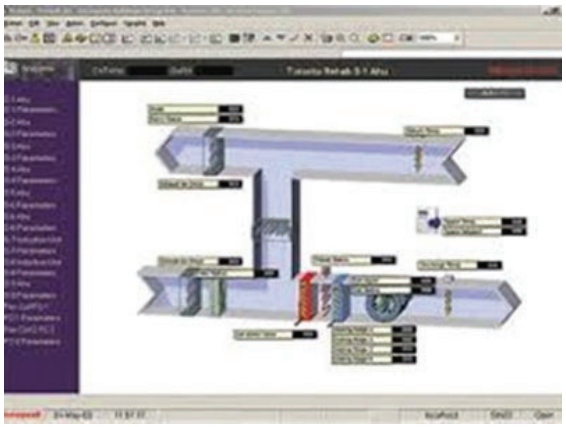
THE KEY BENEFITS OF THIS ECM INCLUDE:

- Energy savings from reducing total energy consumption with more efficient, state of the art technology.
- **Cloud-Based Solution** that connects to a building's existing systems - without the need for capital investment - and optimizes energy consumption to drive up savings.
- **Monitor Energy Consumption** savings and zone comfort levels for any duration of time.
- **Reduced maintenance and operational costs** by reducing the runtime of HVAC systems.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
3B HBSM	▪	▪	▪	▪

EXISTING CONDITIONS

HVAC Systems are the biggest consumer of energy in commercial facilities, and most rely on conservative and inefficient control strategies. Manual or scheduled set-point adjustment strategies simply can't account for the complexity of a building's dynamic occupancy and weather conditions – while maintaining comfort levels.



HVAC Equipment Control

HVAC Equipment Control

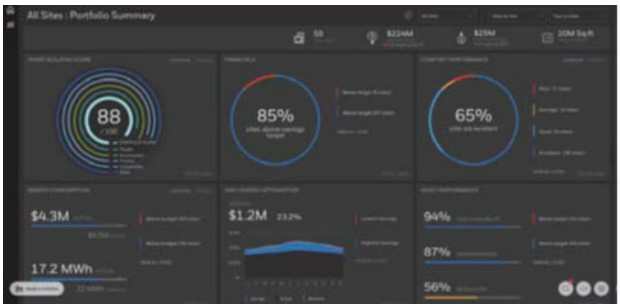
PROPOSED SOLUTION

We propose to deploy Honeywell Forge Predictive Maintenance, an application that automates the detection of faults and anomalies in the operation of building heating, ventilation, and air conditioning (HVAC) systems which impact building comfort, energy consumption or the life cycle of the assets. Faults are raised in the way of service cases containing actionable recommendations about how to address the fault and are presented to the building operator via the enterprise dashboards. By adopting a Predictive Maintenance program, building operators can transition from costly preventative and reactive maintenance programs to a pro-active or just-in-time maintenance program.

The benefits of a Predictive Maintenance program include:

- Reduced labor/subcontract cost associated with performing preventative maintenance activities
- Reduced labor/subcontract cost by identification of Service Case root cause with recommended actions to resolve the fault
- Reduced energy cost by immediately identifying and addressing anomalies which impact energy consumption
- Increased occupant productivity by immediately identifying and addressing anomalies which impact occupant comfort
- Reduced capital and operational expenses by identifying and addressing anomalies which impact the life cycle of equipment and components
- Boost operational continuity by reducing equipment failures and reactive activity

Healthy Buildings Technologies provide a set of tools to help building operators optimize the health of their building environments, operate more cleanly and safely, comply with social distancing policies, and reassure occupants as part of a return-to-business strategy. Honeywell Forge integrates building controls, air quality sensors, video feeds and secure access points then applies advanced analytics to calculate a simple, real-time Healthy Building Score. Site-level performance scores are aggregated for comparison and benchmarking across your portfolio to inform your strategic plan. The package provides insights and analytics to improve indoor environment, highlight proactive actions and automate incident response standards to manage and respond to alerts, anytime, anywhere.



SCOPE OF WORK

System Agnostic

Works with the existing BMS system using the open integration power of Niagara ®.

Safe & Secured

Built-in safety features ensure HVAC systems are always controlled – even during unexpected disturbances.

Autonomous Control

No need for customer intervention or expertise through this closed loop, continuously monitored solution.

Real-Time Intelligence

Advanced machine learning calculates occupancy and weather data to optimize set-points every 15-minutes.

Domain Expertise
A solution built on over one-hundred years of experience in building technologies.

Smart Visualization
Solution identifies pre-existing faults and delivers real-time energy, savings and comfort metrics.

> *Energy needs fluctuate based on seasons, weather, occupancy and usage. With Energy Optimization we have demonstrated that we can use the latest self-learning algorithms to optimize building operation.*

CHANGES IN INFRASTRUCTURE

None.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

None.

ENVIRONMENTAL ISSUES

Resource Use	Energy savings will result from optimized building operation.
Waste Production	No waste will be generated as a result of this ECM.
Environmental Regulations	No environmental impact is expected.

ECM 4A Building Envelope Improvements

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Energy savings** from reducing unwanted outside air infiltration.
- **Equipment longevity** due to more efficient and less wasteful equipment utilization.
- **Occupancy comfort and productivity** by way of enhanced temperature and humidity control throughout your buildings.
- **Improved building envelope** from addressing building gaps that allow unconditioned air penetration.

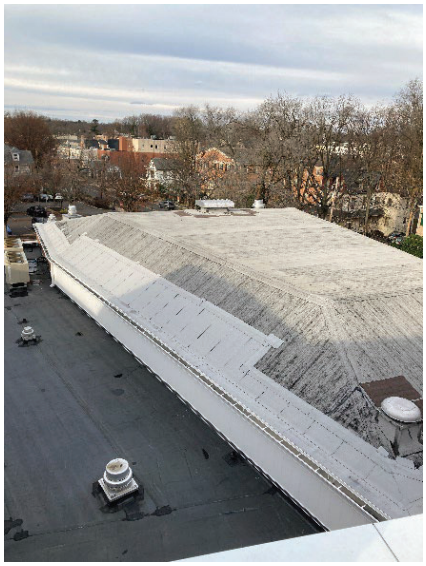
ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
4A Building Envelope Improvements	▪	▪	▪	▪

EXISTING CONDITIONS

Heat loss due to infiltration is a common problem, particularly in places with long and cold winter seasons such as NJ. This problem has been shown to represent the single largest source of heat loss or gain through the building envelopes of nearly all types of buildings. Our work has found 30% to 50% of heat loss attributable to air leaks in buildings.

Honeywell uncovered several leaks that allow for heat loss to occur during the winter season and unwanted heat gains during the summer season. These problems include door gaps, exhaust fans in poor condition, open windows or windows in poor condition, lack of air sealing, and insulation.

Haddonfield Memorial High School - Building Envelope



Haddonfield Middle School - Building Envelope

Honeywell has helped customers like you to address these problems with a comprehensive and thorough building envelope solution that seals up your buildings to improve occupancy comfort and help eliminate unwanted energy waste. We propose to conduct a comprehensive weatherization job to weatherproof doors and windows, caulk and seal leaks, and install spray foam and rigid foam boards to stop unwanted air movement and provide a thermal barrier between spaces. Part of this process may include decoupling floor-to-floor and compartmentalizing of components of the building to equalize pressure differences.

PROPOSED SOLUTION

Table 4A.1 Proposed Building Envelope Scope

Building	Buck Frame Air Sealing (LF)	Door - Install Jamb Spacer (Units)	Door Weather Striping - Doubles (Units)	Door Weather Stripping - Singles (Units)	Roof-Wall Intersection Air Sealing (LF)	Buck Frame Air Sealing (LF)
Elizabeth Haddon Elementary School		3	7	6	263	
Haddonfield Memorial High School		9	32	16	446	
Haddonfield Middle & Central Elementary Schools	32	6	17	11		32
Tatem Elementary School			7	4	247	
Total Quantity	**32**	**18**	**63**	**37**	**956**	**32**

Roof-Wall Joints

- **Existing** – Buildings throughout the School District were found to require roof-wall joint air sealing.
- **Proposed** – Honeywell recommends using a high-performance sealant. In some buildings, two-component foam will be used. Any cantilevers off the buildings will be sealed with backer rod and sealant. Finally, the inside vestibule corners should be sealed with backer rod and sealant.

Roof Penetrations

- **Existing** - There are many roof top exhaust fans that require damper cleaning, lubrication, and inspection for proper operation and to seal the roof deck to prevent penetration. Some units may be deemed to be too oversized for this service. Some buildings have roof-top AHUs with ducts that may show air leak during an IGA.
- **Proposed** – Honeywell recommends if there is leak, these duct penetrations will be sealed with two-component polyurethane foam. Skylights will also be sealed. Sealant will be injected behind the drip cap to eliminate airflow.

Roof Overhangs

- **Existing** – Roof overhangs at exterior doors are open to the drop ceilings, providing a pathway allowing heated and cooled air to escape between the interior and exterior of the building.
- **Proposed** – Honeywell proposes to install rigid foam boards and seal the perimeter and any penetrations with spray foam to prevent air leak and provide a sufficient thermal barrier between the spaces.

Doors

- **Existing** – Doors in the district need weather-stripping replacement and/or door sweeps.
- **Proposed** – Honeywell recommends new weather stripping and door sweeps to be installed where needed.

Benefits

This work will allow for more efficient operation of your buildings by reducing heating and cooling losses throughout the year. In addition, the draftiness of the buildings and hot and cold spots will be significantly reduced. A reduction in air infiltration will also minimize potential concerns for dirt infiltration or indoor air quality concerns including allergies.

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.

EQUIPMENT INFORMATION

Manufacturer and Type	Several quality and cost-effective manufacturers are available. The District and Honeywell 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

Building envelope 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

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Energy savings** from reducing unwanted outside air infiltration.
- **Equipment longevity** due to more efficient and less wasteful equipment utilization.
- **Occupancy comfort and productivity** thanks to a tighter and more efficient building envelope.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
4B Roof Replacements	▪	▪	▪	▪

EXISTING CONDITIONS

There are no warranties for most of the roofs. A section of the Seabrook School roof is due to expire in the near future. The heat loss and heat gains occurring due to low R-value of the existing roof insulation can be improved through sealing. Additionally, roofs in poor condition can lead to water migration and future building envelope problems. Potential problematic leakage areas can be around perimeters and equipment curbing.

Haddonfield Memorial High School – Existing Roof

J. Fithian Tatem Elementary School – Existing Roof

PROPOSED SOLUTION

Honeywell proposes replacing existing roofs and installing a new roofing system in order to provide resistance to water intrusion, UV exposure and natural weathering. The roof upgrade will allow for less infiltration through the roof and air conditioning units to work less.

Table 4B.1 Existing Roof Area to Upgrade

Building	Approximate Roof Square Footage to Upgrade
Haddonfield Middle School & Central Elementary School	34,386
J. Fithian Tatem Elementary	16,010
Haddonfield Memorial High School	18,512
Elizabeth Haddon Elementary School	12,396

ENERGY SAVINGS METHODOLOGY AND RESULTS

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

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 $	*= UAdTproposed – UAdTexisting*
Winter Savings (Therms)	*= Energy Savings/Boiler Eff./100,000*
Summer Savings (Tons Cooling)	*= Energy Savings/12,000 Btu/Ton*

INTERFACE WITH BUILDING

The new roof sealing will be constructed to match existing, maintaining contours of the existing building.

CHANGES IN INFRASTRUCTURE

The existing roofing will be sealed at the above referenced roof locations.

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 HVAC energy usage and better occupant comfort.
Waste Production	Existing roof material will be removed and disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 5A Cogeneration CHP

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Energy savings** from utilizing a Combined Heat and Power (CHP) system to supplement the existing heating system.
- **Operational savings** resulting from improved operational efficiencies unique to CHP technology.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
5A Cogeneration CHP			▪	

EXISTING CONDITIONS

No Combined Heat and Power (i.e. cogeneration) units are currently located within the School District.

Cogeneration Configuration

Ecopower CHP

PROPOSED SOLUTION

Honeywell recommends the installation of the Ecopower micro-cogeneration system provides heat and electrical power in a cost effective and environmentally friendly manner. Using a natural gas or propane fueled Marathon Engine, the system captures thermal energy for space heating or domestic hot water. The micro-CHP uses heat generated by an internal combustion engine to produce between 13,000 - 47,000 BTU of heat per hour while simultaneously co-generating 1.2 - 4.4kW of electricity per hour. The system is thermally driven. The Ecopower will anticipate the heat demand from sensors located in the house, buffer tank or outside and varies its output to satisfy the demand. It will modulate (slow down or speed up) to run at a level to maintain a constant heat requirement in order to keep the engine running as long as possible, ensuring maximum electrical generation.

SCOPE OF WORK

Table 5A.1 Proposed Cogeneration Units

Building	Manufacturer	Model	kW	Qty.
Haddonfield Memorial HS	Axiom	Ecopower	4.4	1

ENERGY SAVINGS METHODOLOGY AND RESULTS

Savings are based on energy conversion of natural gas to thermal and electrical energy.

EQUIPMENT INFORMATION

Manufacturer and Type	Axiom Ecopower, Electrical Output 1.2-4.4 kW, Thermal Output 13,000 - 47,000 Btu/hr, Overall efficiency 93%
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

The proposed micro-generator unit would reside in or near the boiler room.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

Minor support will be required for the interruption of utilities for brief tie-in periods. The customer and Honeywell will decide upon the exact location of the CHP installation.

ENVIRONMENTAL ISSUES

Resource Use	Energy will be generated to supplement energy purchased from the electrical utility.
Waste Production	Any removed parts will be disposed of properly.
Environmental Regulations	Aside from the environmental benefits from on-site energy generation, no other environmental impact is expected.

ECM 6A Energy Sourcing

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced utility costs.**
- **Additional savings** provide the Schools with more potential ESIP funding to expand the overall project scope and include additional projects.
- **No upfront costs.**

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
6A Energy Sourcing	▪	▪	▪	▪

ECM OVERVIEW

Procuring, or purchasing, natural gas and electricity can be confusing and time-consuming as school administrators are faced with trying to sort through the overwhelming number of energy companies now offering electric and natural gas supply alternatives. A thorough understanding of the underlying wholesale markets, power generation, delivery factors, economic and political influences and their joint impact on prices are all vital.

PROPOSED SOLUTION

Energy Sourcing gives a school district the opportunity to proactively purchase electricity and natural gas supply in order to make strategic choices, in an effort to minimize energy costs. Honeywell shall guide the District's energy procurement efforts by leveraging our strong relationships with viable energy suppliers and strategic energy managers to obtain the most competitive pricing and provide you with an all-inclusive approach to best manage your energy costs.

ENERGY SAVINGS METHODOLOGY AND RESULTS

Savings are based on the reduction in utility price.

CHANGES IN INFRASTRUCTURE

None.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

None.

ENVIRONMENTAL ISSUES

Resource Use	None.
Waste Production	None.
Environmental Regulations	None.

ECM 6B Remote Solar - Net Metering- Utility Credit

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced utility costs.**
- **Additional savings** from solar can provide the District with more potential ESIP funding to expand the overall project scope and include additional projects.
- **Educational asset** to provide additional tools for teachers to engage students on sustainability and the environment.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
6B Remote Solar – Net Metering	▪	▪	▪	▪

ECM OVERVIEW

Similar to Solar PPA, customers who are unable to install solar system on their site due to shading, interconnection, roof conditions and other factors can install Remote Solar. This solution is especially important for end users whose ability to install solar on the premises is limited.

With Remote Solar, the solar system is developed in a geographic location within the end user's utility territory through a Power Purchase agreement. Solar energy is obligated by the customer and transferred thereto in the form of utility credits as if solar were connected at their facilities.

Honeywell will assist in the feasibility study during your IGA, in conjunction with your technical consultant and legal team, to provide RFP development, solicitation, and oversight of the Remote Solar Net Metering Program.

Honeywell will solicit proposals from qualified providers who are able to provide this solution within a 24- to 36-month window from time of engagement.

PROPOSED SOLUTION

Honeywell proposes the District to install Remote Solar Net Metering in order to reduce utility costs.

Table 6B.1 Potential Solar Energy Purchased from Remote Solar Net Metering Program

Building	kWh Purchased
Haddonfield Middle School & Central Elementary School	304,291
J. Fithian Tatem Elementary	100,824
Haddonfield Memorial High School	280,475
Elizabeth Haddon Elementary School	116,582
TOTAL	802,172

ENERGY SAVINGS METHODOLOGY AND RESULTS

Savings are based on the difference in kWh price between the Remote Solar rate and the District's current electrical rate.

CHANGES IN INFRASTRUCTURE

None.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

None.

ENVIRONMENTAL ISSUES

Resource Use	None.
Waste Production	None.
Environmental Regulations	Aside from the environmental benefits of increasing energy awareness no other environmental impact is expected.

ECM 6C Solar PPA

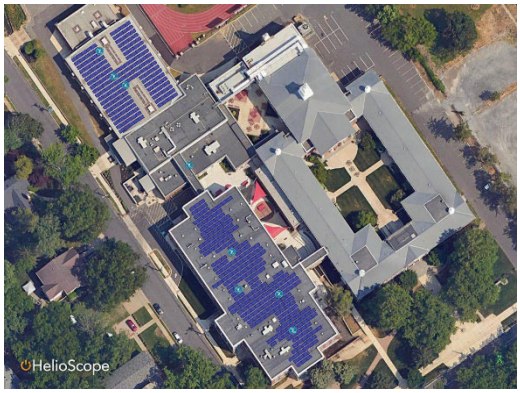
THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced utility costs.**
- **Guaranteed utility rates** for 15 years to provide a valuable hedge against future price volatility and deliver greater budgetary certainty utilizing clean electricity.
- **Additional savings** from solar can provide the schools with more potential ESIP funding to expand the overall project scope and include additional projects.
- **Educational asset** to provide additional tools for teachers to engage students on sustainability and the environment.
- **Low risk** given that maintenance is provided by the 3rd party system owner.
- **No upfront costs.**

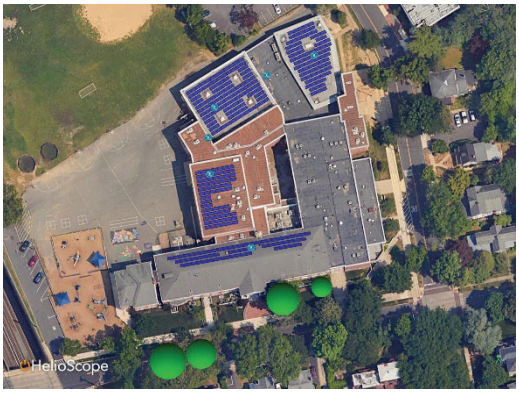
ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
6C Solar PPA	▪	▪	▪	▪

ECM OVERVIEW

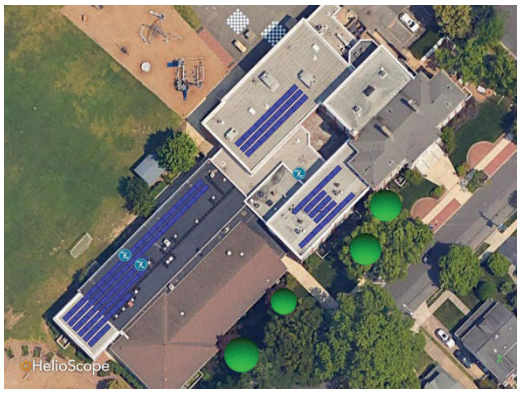
Honeywell recommends that the District further assess the feasibility of a solar photovoltaic system on District owned roofs to generate on-site renewable electricity. This could be provided at no upfront cost via a Power Purchase Agreement (PPA). A PPA is a public-private partnership financial arrangement in which a third-party solar company owns, operates, and maintains your photovoltaic system, while the host customer agrees to provide the site for the system on its property. The solar system's power production is purchased by you for a predetermined price ($/kWh) and for a predetermined period. This stable price for electricity will be lower than the utilities and third-party suppliers, thereby allowing you to benefit from lower electricity prices, on-site renewable energy generation, a reduction in greenhouse gas emissions and a powerful educational tool for your teachers and students. Meanwhile, the system will not add any additional maintenance costs since it is owned by the third-party solar company. One of the more significant benefits of this potential ECM is that it will provide for a rate change, helping to deliver greater savings within your ESIP project to help fund other measures



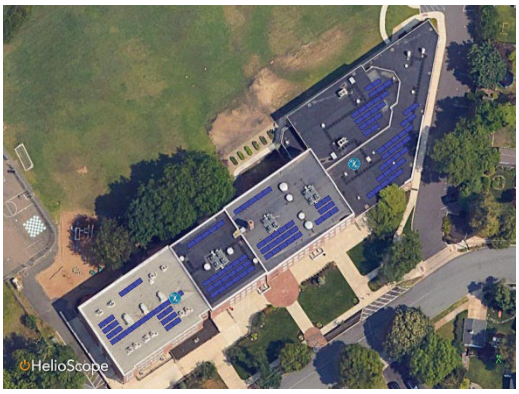
Potential Roof Mount Solar - Haddonfield HS



Potential Roof Mount Solar – Haddonfield MS



Potential Roof Mount Solar - Elizabeth Haddon ES



Potential Roof Mount Solar – J. Fithian Tatem ES

Honeywell will oversee the design and construction of the system. We will assist in the feasibility study during your IGA, in conjunction with your technical consultant and legal team, to provide RFP development, solicitation, and oversight of the installation of a solar photovoltaic system.

PROPOSED SOLUTION

Honeywell proposes to install a new roof mount solar PPA system. The system will provide power to the potential buildings listed in the chart below.

Table 6C.1 Proposed Solar PPA System

Building	Type	kW DC	kWh AC Generated
Haddonfield Middle School & Central Elementary School	Roof Mount	175.0	246,854
J. Fithian Tatem Elementary	Roof Mount	60.0	84,635
Haddonfield Memorial High School	Roof Mount	233.0	328,668
Elizabeth Haddon Elementary School	Roof Mount	62.0	87,457
Total			**747,614**

ENERGY SAVINGS METHODOLOGY AND RESULTS

Savings are based on the difference in kWh price between the PPA and the District's current electrical supplier.

CHANGES IN INFRASTRUCTURE

The proposed solar array would be roof-mounted only.

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	None.
Waste Production	None.
Environmental Regulations	Aside from the environmental benefits of increasing energy awareness no other environmental impact is expected.

ECM 6D Solar PV Purchase

THE KEY BENEFITS OF THIS ECM INCLUDE:

- **Reduced utility costs.**
- **Additional savings** from solar can provide the schools with more potential ESIP funding to expand the overall project scope and include additional projects.
- **Educational asset** to provide additional tools for teachers to engage students on sustainability and the environment.

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
6D Solar PV Purchase	▪	▪	▪	▪

ECM OVERVIEW

Similar to Solar PPA, another option is a self-owned solar project. Energy storage projects were previously ineligible for tax credits unless they were connected directly to solar power projects.

The Inflation Reduction Act removes these requirements and allows energy storage projects to receive the same 30% tax credit, even if they are stand-alone facilities. Batteries connected to a solar power project will continue to qualify for the credit, even if they are no longer being charged by solar power. Solar power projects eligible for the full 30% tax credit can increase their tax credit by an additional 10% – to 40% in total – by purchasing domestically produced hardware. Per the document, 100% of steel and iron must be US manufactured in the United States. For manufactured goods – like solar panels, inverters, and electrical gear – the goods must initially be 40% US manufactured, though this percentage will increase in the future.

Historically, the federal solar tax credit has only been available to for-profit businesses that pay taxes. Because of this, solar ownership has been less viable for tax-exempt organizations, and power purchase agreements have been the only real option.

Thanks to the Inflation Reduction Act, tax-exempt organizations can now receive a direct payment worth 30% of their solar installation costs, making solar installation and ownership a more viable option for public schools, government buildings, and non-profit organizations.

Honeywell will evaluate the two methods of Solar Procurement for the District to further assess the feasibility of a solar photovoltaic system on District owned roofs to generate on-site renewable electricity.

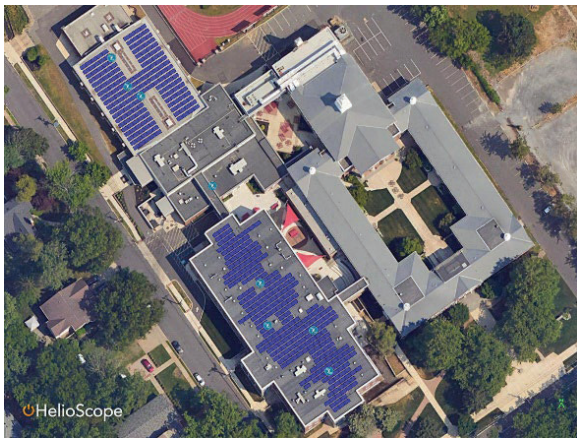
Honeywell will oversee the design and construction of the system. We will assist in the feasibility study during your IGA, in conjunction with your technical consultant and legal team, to provide RFP development, solicitation, and oversight of the installation of a solar photovoltaic system.

PROPOSED SOLUTION

Honeywell proposes to install a new solar PV system at the potential buildings listed in the chart below.

Table 6D.1 Proposed Solar PV System

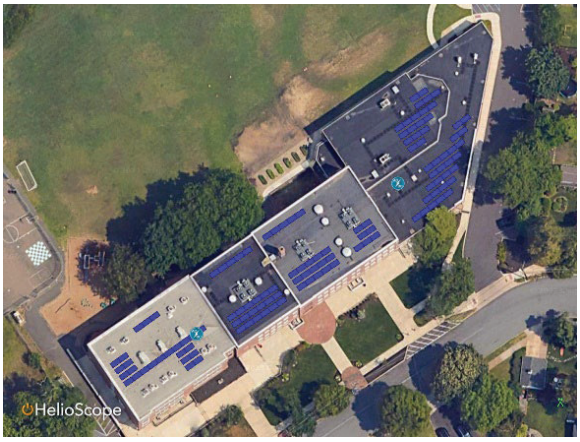
Building	Type	kW DC	kWh AC Generated
Haddonfield Middle School & Central Elementary School	Roof Mount	175.0	246,854
J. Fithian Tatem Elementary	Roof Mount	60.0	84,635
Haddonfield Memorial High School	Roof Mount	233.0	328,668
Elizabeth Haddon Elementary School	Roof Mount	62.0	87,457
Total			**747,614**



Potential Roof Mount Solar - Haddonfield HS

Potential Roof Mount Solar – Haddonfield MS

Potential Roof Mount Solar - Elizabeth Haddon ES



Potential Roof Mount Solar – J. Fithian Tatem ES

ENERGY SAVINGS METHODOLOGY AND RESULTS

Savings are based on the current District's kWh price. A 0.83 DC to AC safety factor is assumed base on efficiency of DC to AC invertors.

CHANGES IN INFRASTRUCTURE

The proposed solar array would be roof-mounted only.

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	None.
Waste Production	None.
Environmental Regulations	Aside from the environmental benefits of increasing energy awareness no other environmental impact is expected.

SECTION D
TECHNICAL & FINANCIAL SUMMARY

SECTION D – TECHNICAL & FINANCIAL SUMMARY

1. RECOMMENDED ESIP PROJECT

Form II: Recommended Project — Energy Conservation Measures (ECMs) Summary Form

FORM II
ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ENERGY CONSERVATION MEASUREs (ECMs) SUMMARY FORM
HADDONFIELD SCHOOLS
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: Honeywell International

Proposed Preliminary Energy Savings Plan: ECMs (Base Project)	Estimated Costs [1] $	Estimated Annual Savings $	Estimated Simple Payback (years)
1A LED Lighting	$ 763,182	$ 94,912	8.04
2F Chiller Replacements	$ 1,975,777	$ 72,987	27.07
3A Building Management Controls	$ 80,316	$ 82,429	0.97
4A Building Envelope Improvements	$ 114,225	$ 5,764	19.82
5A Cogeneration CHP	$ 185,809	$ 1,270	146.27
6A Energy Sourcing	$ -	$ 26,561	-
Add additional lines as needed* **Project Summary:**	$ 3,119,309	$ 283,924	10.99

Optional ECMs Considered, but not included with base project at this time	Estimated Costs [1] $	Estimated Annual Savings $	Estimated Simple Payback (years)
1B Stadium Lights	$ 226,075	$ 6,545	34.54
1C Destratification Fans	$ 350,237	$ 4,680	74.83
2C Boiler Replacements	$ 4,357,138	$ 33,876	128.62
2B Domestic Water Heater Replacements	$ 128,983	$ 404	319.13
2A HVAC Unit Upgrades	$ 1,574,701	$ 19,077	82.55
2D Split System Upgrades	$ 2,414,478	$ 1,012	2,384.80
2E Premium Efficiency Motors and VFDs	$ 513,833	$ 16,907	30.39
2G Cooling Tower Replacement	$ 322,603	$ 2,014	160.21
2H Boiler Controls	$ 568,591	$ 7,818	72.73
2I Unitventilator/Condensing Unit Replacements	$ 740,463	$ 2,053	360.62
2J Unit Ventilator Replacements with VRF	$ 5,476,798	$ 6,371	859.70
2K Gym Floor Replacements	$ 2,479,871	$ 16,147	153.58
2L Pipe Insulation	$ 122,769	$ 1,179	104.11
2M Energy Recovery Unit Replacements	$ 982,527	$ 164	6,008.63
3B HBSM	$ 4,818,957	$ 4,759	1,012.54
4B Roof Replacements	$ 5,562,600	$ 3,010	1,847.91
6C Solar PPA	$ 0	$ 54,266	0.00
6B Virtual Solar Net Metering	$ 0	$ 89,452	0.00
6D Solar PV Purchase	$ 1,694,815	$ 84,171	20.14

Proposed Energy Related Capital Improvements	Supporting ECM	Estimated Cost $	Percentage of Total Project Cost (Not to exceed 15%)

(1) The total value of Hard Costs is defined in accordance with standard AIA definitions that include: Labor Costs, Subcontractor Costs, Cost of Materials & Equipment, Temporary Facilities and Related Items, and Miscellaneous Costs such as Permits, Bonds Taxes, Insurance, Mark-ups, Overhead, Profit, etc.

Form III: Recommended Project — Projected Annual Energy Savings Data Form

FORM III

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP)
PROJECTED ANNUAL ENERGY SAVINGS DATA FORM
HADDONFIELD SCHOOLS
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: **Honeywell International**

The projected annual savings for each fuel type MUST be completed using the following format. Data should be given in the form of fuel units that appear in the utility bills.

Energy/Water	ESCO Developed Baseline (Units)	ESCO Developed Baseline (Costs $)	Proposed Annual Savings (Units)	Proposed Annual Savings (Costs $)
Electric Demand (KW)	12,143	$78,830	1,592	$10,149
Electric Energy (KWH)	3,350,558	$479,265	896,750	$100,948
Natural Gas (therms)	250,421	$242,152	69,056	$82,985
Fuel Oil (Gal)	0	$0	0	$0
Steam (Pounds)				
Water (gallons)				
Other (Specify Units)				
Other (Specify Units)				
Avoided Emissions (1)	Provide in Pounds (Lbs)			
NOX	1,380			
SO2	601			
CO2	1,396,357			

(1) ESCOs are to use the rates provided as part of this RFP to calculate Avoided Emissions. Calculation for all project energy savings and greenhouse gas reductions will be conducted in accordance with adopted NJBPU protocols

(2) "ESCOs Developed Baseline": Board's current annual usages and costs as determined by the proposing ESCO; based off Board's utility information as provided to proposing ESCO.

(3) "Proposed Annual Savings": ESCOs proposed annual savings resulting from the Board's implementation of the proposed ESP, as based upon "ESCOs Developed Baseline".

Form IV: Recommended Project — Projected Annual Energy Savings Data Form in MMBTUs

FORM IV

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
PROJECTED ANNUAL ENERGY SAVINGS DATA FORM IN MMBTUs
HADDONFIELD SCHOOLS
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: **Honeywell International**

The projected annual energy savings for each fuel type MUST be completed using the following format. Data should be given in equivalent MMBTUs.

ENERGY	ESCO Developed Baseline	ESCO Proposed Savings Annual	Comments
Electric Energy (MMBTUs)	11,432	3,060	
Natural Gas (MMBTUs)	25,042	6,906	
Fuel Oil (MMBTUs)	0	0	
Steam (MMBTUs)			
Other (Specify) (MMBTUs)			
Other (Specify)			

NOTE: MMBTU Defined: A standard unit of measurement used to denote both the amount of heat energy in fuels and the ability of appliances and air conditioning systems to produce heating or cooling.

Form VI: Recommended Project — District Preliminary Annual Cash Flow Analysis Forms

FORM VI
ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ESCO's PRELIMINARY ANNUAL CASH FLOW ANALYSIS FORM
HADDONFIELD SCHOOLS
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: **Honeywell International**

Note: Proposers must use the following assumptions in all financial calculations:
(a) The cost of all types of energy should be assumed to inflate at: **2.4%** gas, **2.2%** electric per year

1. Term of Agreement: **20** (Years) (Months)
2. Construction Period [2] (months): **12**
3. Cash Flow Analysis Format:

Form II Cost:	$ 3,119,309
Technical Energy Audit	$ 95,853
Project Costs [1]:	$ 3,215,163
Bond Counsel Muni Advisor	$ 150,000
Contingency/Rounding	
Financed Value:	**$ 3,365,163**

Interest Rate to Be Used for Proposal Purposes: **4.00%**

Year	Annual Energy Savings	Solar Savings	Annual Operational Savings	Energy Rebates/Incentives [4]		Total Annual Savings	Annual Project Costs	Board Costs	Annual Service Costs [3]	Net Cash-Flow to Client	Cumulative Cash Flow
				Value	Utility						
Installation	$ 58,225					$ 58,225	$ -	$ -	$ -	$ 58,225	$ 58,225
1	$ 194,082	$ -	$ 89,842	$ 135,003	PSEG	$ 418,927	$ (408,527)	$ (408,527)	$ -	$ 10,400	$ 68,625
2	$ 198,518	$ -	$ 89,842			$ 288,360	$ (277,960)	$ (277,960)	$ -	$ 10,400	$ 79,025
3	$ 203,055	$ -	$ 19,842			$ 222,897	$ (212,497)	$ (212,497)	$ -	$ 10,400	$ 89,425
4	$ 207,696	$ -	$ 19,842			$ 227,538	$ (217,138)	$ (217,138)	$ -	$ 10,400	$ 99,825
5	$ 212,444	$ -	$ 19,842			$ 232,286	$ (221,886)	$ (221,886)	$ -	$ 10,400	$ 110,225
6	$ 217,300	$ -				$ 217,300	$ (206,900)	$ (206,900)	$ -	$ 10,400	$ 120,625
7	$ 222,268	$ -				$ 222,268	$ (211,868)	$ (211,868)	$ -	$ 10,400	$ 131,025
8	$ 227,349	$ -				$ 227,349	$ (216,949)	$ (216,949)	$ -	$ 10,400	$ 141,425
9	$ 232,546	$ -				$ 232,546	$ (222,146)	$ (222,146)	$ -	$ 10,400	$ 151,825
10	$ 237,863	$ -				$ 237,863	$ (227,463)	$ (227,463)	$ -	$ 10,400	$ 162,225
11	$ 243,301	$ -				$ 243,301	$ (232,901)	$ (232,901)	$ -	$ 10,400	$ 172,625
12	$ 248,865	$ -				$ 248,865	$ (238,465)	$ (238,465)	$ -	$ 10,400	$ 183,025
13	$ 254,555	$ -				$ 254,555	$ (244,155)	$ (244,155)	$ -	$ 10,400	$ 193,425
14	$ 260,376	$ -				$ 260,376	$ (249,976)	$ (249,976)	$ -	$ 10,400	$ 203,825
15	$ 266,330	$ -				$ 266,330	$ (255,930)	$ (255,930)	$ -	$ 10,400	$ 214,225
16	$ 272,421	$ -				$ 272,421	$ (262,021)	$ (262,021)	$ -	$ 10,400	$ 224,625
17	$ 278,651	$ -				$ 278,651	$ (268,251)	$ (268,251)	$ -	$ 10,400	$ 235,025
18	$ 285,024	$ -				$ 285,024	$ (274,624)	$ (274,624)	$ -	$ 10,400	$ 245,425
19	$ 291,542	$ -				$ 291,542	$ (281,142)	$ (281,142)	$ -	$ 10,400	$ 255,825
20	$ 298,211	$ -				$ 298,211	$ (287,034)	$ (287,034)	$ -	$ 11,177	$ 267,001
Totals	$ 4,910,620	$ -	$ 239,210	$ 135,003		$ 5,284,833	$ (5,017,832)	$ (5,017,832)	$ -	$ 267,001	$ 267,001

NOTES:
(1) Includes: Hard costs and project service fees defined in ESCO's PROPOSED "FORM V"
(2) No payments are made by during the construction period.
(3) This figure should equal the value indicated on the ESCO's PROPOSED "FORM V". DO NOT include in the Financed Project Costs.
(4) As of July 1, 2021, all of former NJ Clean Energy Program incentive programs transitioned over to the investor-owned gas and electric utility companies. Subsequently, the BPU is requiring that all ESIP projects consult with the DCA and follow all DCA guidance regarding the procurement of all subcontractors.

HONEYWELL IS NOT ACTING AS A MUNICIPAL ADVISOR OR FIDUCIARY ON YOUR BEHALF. ANY MUNICIPAL SECURITIES OR FINANCIAL PRODUCTS INFORMATION PROVIDED IS FOR GENERAL INFORMATIONAL AND EDUCATIONAL PURPOSES ONLY AND YOU SHOULD OBTAIN THE ADVICE OF A LICENSED AND QUALIFIED FINANCIAL ADVISOR REGARDING SUCH INFORMATION.

Building-by-Building Simple Payback Summary

Building & ECM	kWh Savings ($)	kW Savings ($)	Natural Gas Savings ($)	Annual Energy Cost Savings ($)	Annual Operational Savings ($)	Net Costs ($)	Simple Payback
Elizabeth Haddon Elementary School	**$ 3,361**	**$ 21**	**$ 10,074**	**$ 13,455**	**$ -**	**$ 31,675**	**1.6**
1A LED Lighting	$ 123	$ 21	$ (5)	$ 139	$ -	$ -	-
3A Building Management Controls	$ 2,995	$ -	$ 6,391	$ 9,386	$ -	$ 14,873	1.1
4A Building Envelope Improvements	$ 243	$ -	$ 562	$ 804	$ -	$ 16,802	14.0
6A Energy Sourcing	$ -	$ -	$ 3,126	$ 3,126	$ -	$ -	-
Haddonfield Memorial High School	**$ 52,624**	**$ 5,119**	**$ 45,796**	**$ 184,845**	**$ 81,306**	**$ 2,655,821**	**6.7**
1A LED Lighting	$ 36,603	$ 4,839	$ (1,972)	$ 50,776	$ 11,306	$ 407,261	4.4
2F Chiller Replacements	$ 2,987	$ -	$ -	$ 72,987	$ 70,000	$ 1,975,778	9.3
3A Building Management Controls	$ 10,961	$ -	$ 31,380	$ 42,341	$ -	$ 32,721	0.5
4A Building Envelope Improvements	$ 723	$ -	$ 2,207	$ 2,930	$ -	$ 54,252	12.4
5A Cogeneration CHP	$ 1,350	$ 280	$ (359)	$ 1,270	$ -	$ 185,809	98.3
6A Energy Sourcing	$ -	$ -	$ 14,540	$ 14,540	$ -	$ -	-
Haddonfield Middle School & Central Elementary School	**$ 24,610**	**$ 2,469**	**$ 21,086**	**$ 52,259**	**$ 4,094**	**$ 237,242**	**2.8**
1A LED Lighting	$ 15,147	$ 2,469	$ (629)	$ 21,080	$ 4,094	$ 192,982	5.2
3A Building Management Controls	$ 9,110	$ -	$ 14,010	$ 23,120	$ -	$ 17,848	0.5
4A Building Envelope Improvements	$ 353	$ -	$ 852	$ 1,205	$ -	$ 26,412	14.7
6A Energy Sourcing	$ -	$ -	$ 6,853	$ 6,853	$ -	$ -	-
J. Fithian Tatem Elementary	**$ 20,354**	**$ 2,540**	**$ 6,030**	**$ 33,365**	**$ 4,442**	**$ 194,571**	**3.5**
1A LED Lighting	$ 16,566	$ 2,540	$ (632)	$ 22,917	$ 4,442	$ 162,939	4.0
3A Building Management Controls	$ 3,533	$ -	$ 4,049	$ 7,582	$ -	$ 14,873	1.3
4A Building Envelope Improvements	$ 254	$ -	$ 571	$ 825	$ -	$ 16,759	13.7
6A Energy Sourcing	$ -	$ -	$ 2,042	$ 2,042	$ -	$ -	-
Project Total	**$ 100,948**	**$ 10,149**	**$ 82,985**	**$ 283,924**	**$ 89,842**	**$ 3,119,309**	**5.6**

UTILITY AND OTHER REBATES & INCENTIVES

Summary of Total Rebates and Incentives

Year	Prescriptive Lighting	Prescriptive and Custom HVAC	Total Incentives
Installation			
Year 1	$83,370	$51,633	$135,003
Year 2			
Year 3			
Year 4			
Year 5			
Totals			

Incentives, Rebates and Grants

Honeywell has determined that the Haddonfield School District is eligible for **$135,003** in estimated total incentives for the projects included in the Prescriptive Lighting Programs, Prescriptive and Custom HVAC. Please refer to the tables on below for a breakdown of Haddonfield School District incentive levels on a building-by-building basis for the incentive.

Prescriptive and Custom

Location	Prescriptive Lighting (Initial Installation)	Prescriptive and Custom HVAC
Haddonfield Middle School & Central Elementary School	$21,612	10,597.7
J. Fithian Tatem Elementary	$19,469	8,083.0
Haddonfield Memorial High School	$42,289	24,936.5
Elizabeth Haddon Elementary School	$0	8,016.1
Totals	$83,370	$51,633

3. OPERATIONAL SAVINGS

Summary of Total Operational Savings for Sample Project

Year	Lighting Operation Savings	HVAC Operation Savings	Total Operational Savings
Installation			
Year 1	$19,842	$70,000	$89,842
Year 2	$19,842	$70,000	$89,842
Year 3	$19,842		$19,842
Year 4	$19,842		$19,842
Year 5	$19,842		$19,842

Lighting Operational Savings (5 Years)

This Lighting Operational Savings category calculates the existing material costs for lamps and ballasts considering failure rate and average costs and compares to the reduced maintenance costs with all new LEDs to establish the operational savings.

School	Annual Maintenance Savings
Haddonfield Middle School & Central Elementary School	$4,094
J. Fithian Tatem Elementary	$4,442
Haddonfield Memorial High School	$11,306
Elizabeth Haddon Elementary School	$0
Total:	**$19,842**

Mechanical Operational Savings (2 Years)

This Mechanical Operational Savings category calculates the existing material costs for repairs, based on the mechanical material and replacement costs from recent bills in the equipment being selected for savings the district is allocating $70,000 per year for Operational cost savings in year one and two.

4. TECHNICAL ENERGY AUDIT & PROJECT DEVELOPMENT

The key benefits of this work include:

- **Identify potential improvement and energy conservation measures**
- **Identify baseline energy use**
- **Identify preliminary costs and savings**

ECM Description	Haddonfield Middle School & Central Elementary School	J. Fithian Tatem Elementary School	Haddonfield Memorial High School	Elizabeth Haddon Elementary School
Technical Energy Audit & Project Development			▪	

EXISTING CONDITIONS

The District has completed a Local Government Energy Audit and needs to complete an Energy Savings Plan to move forward with an Energy Savings Improvement Program.

PROPOSED SOLUTION

The Technical Energy Audit, or Energy Savings Plan (ESP) is the cornerstone of the ESIP program. It lays out what measures will be implemented to save energy, the expected payback period, and how it fits into the overall plan to reduce consumption. The ESP gives a snapshot of the project financial structure. Furthermore, the ESP must be approved by the Board and remain cash flow positive throughout the term of the project. These plans have a lifespan of 15 to 20 years depending on the ECMs being installed.

PROCESS

Honeywell's approach to the engineering portion of an ESPC is detailed below and will be led by identified engineering team member. A technically sound solution that addresses the District's current needs and future goals is the cornerstone to a successful Energy Savings Improvement Program.

PRELIMINARY AND INVESTMENT GRADE AUDIT

Preliminary Energy Audit Procedure

- This phase begins the process of identifying possible energy saving measures and infrastructure improvements at the facilities. All possible opportunities will be explored at this stage. These will be evaluated both technically and financially. We also begin to examine the current maintenance procedures taking place at the facility during this audit. The preliminary audit follows the steps below to get to the 30% review with the district.
- Conduct an initial walk-through inspection to become familiar with the buildings, systems equipment, maintenance, operation status, etc.
- Study the plans and specifications and become familiar with the buildings, systems, capacities, equipment, etc.
- Talk with the key decision makers within the District, building operating personnel, occupants, etc. about energy efficiency goals, sustainability goals, HVAC systems, comfort, problems, etc.

- Examine the overall building energy consumption history from the District. Compile a complete energy consumption history on gas, oil, electrical, etc., from utility companies and fuel suppliers. Compare the BTU consumption per square foot per year with other similar buildings and determine degree of variance. 8, 2017 49
- Evaluate current maintenance procedures. Examine future maintenance associated with additional equipment that may be installed.
- Develop a list of existing energy savings opportunities.
- Further develop the most promising energy improvements, based on success criteria.
- Perform preliminary energy savings calculations for the various energy improvements, estimate retrofit costs and calculate estimated paybacks.
- Complete energy baseline analysis for all utilities using the past year of utility data.
- Jointly select with the District at the 30% review which improvements to proceed with and assign priorities. Properly engineer retrofit work and proceed.

Upon completion of this phase of the audit process (equivalent to an ASHRAE Level 1 audit), we will review our findings with the District personnel. Candidate measures will be reviewed on the basis of energy, financial and operational impact. Together with your personnel, we will prioritize facility improvements and energy conservation measures. This is the 30% review identified in the diagram above. Based on the 30% review, a final list of energy conservation measures will then be developed for the in-depth energy audit. Typical financial payback periods are used in this step for the process and are refined as the audit progresses.

Investment Grade Audit Procedures to Final Design

During the investment grade audit phase, we conduct a thorough evaluation of the finalized list of improvements and energy conservation measures that have been mutually agreed upon between Honeywell and Region 4 ESC. This is done to verify project goal requirements along with savings figures, project costs, and maintenance requirements (equivalent to an ASHRAE Level 3 audit). This process comprises five major categories of activity, shown below.

Field Surveys

1. Make a thorough inspection of building systems and equipment and become thoroughly familiar with them. Check out operations, performance, maintenance, malfunctions, comfort, problems, etc.
2. Check nameplate data on equipment.
3. Conduct in-depth interviews with building personnel. Review maintenance, scheduling, performance, comfort, and problems of building, equipment, and systems.
4. Become familiar with actual hours of operation of systems and equipment, and the hours of occupancy of the personnel.

Energy History

1. Field Tests
2. Take test readings of actual flows, temperatures, pressures, rpm's, amps, volts, etc. at HVAC equipment.
3. Monitor readings over a period of time with test and recording equipment (data loggers) where appropriate.
4. Check lighting levels.

Evaluation of Improvements

1. List all project opportunities within the buildings, systems, and equipment.
2. Investigate/apply any applicable grants, incentives, rebates.
3. Develop potential improvements and develop those with most potential in full cooperation with the District write out list of improvements.
4. Calculate the potential energy savings in terms of BTU's and kWh and in cost, using current utility rate structures.
5. Calculate paybacks and return on investments using +/- 10% costs of work data and estimates.

Evaluation of Ongoing Service Needs

1. Review existing maintenance being performed at the facilities.
2. Discuss any gaps in existing equipment maintenance.

Review and Decisions

1. Review with the District. This is the 60% review indicated in the above diagram.
2. Costs of improvements/Improvement Options
3. Energy improvement options
4. Reaffirm Financial Payback Criteria
5. Return on investment
6. Potential savings
7. Select, with the District approval, improvements to proceed with and assign priorities. These final selections will be the outcome of the 90% review described in the diagram above. At the 90% review, final estimated costs will be developed.

After all the technical and financial parameters of the program are identified and the responsibilities of Honeywell and the District are clearly delineated, the contract would be offered to the District. It is structured such that the annual energy cost reductions will, at a minimum, equal or as in most cases, exceed the amortized implementation costs.

5. FINANCING THE ESIP

In accordance with P.L.2012, c.55 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.

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 to be considered in the energy savings plan as a cost to be offset with savings.

In all cases, maturity schedules of lease-purchase agreements or energy savings obligations shall not exceed the estimated average useful life of the energy conservation measures.

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, cities, 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, 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.

Regarding 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.

Tax-Exempt Lease Purchase Financing

The tax-exempt lease is a common form of financing for ESIP projects. Tax-exempt leasing is a tool that meets the basic objectives of debt, spreading the cost of financing over the life of an asset, while avoiding constitutional or statutory limitations on issuing public debt. If structured properly, by including non-appropriation language in the financing documents, the tax-exempt lease will not be considered debt for state law purposes but will be considered debt for federal income tax purposes. Thus, for federal purposes, the interest component of the lease payment is tax-exempt.

Under the New Jersey Energy Savings Improvement Program (ESIP), the Haddonfield School District may authorize a lease purchase agreement between the District and a financier. Ownership of the equipment or improved facilities will pass to the District when all the lease payments have been made. There are legal expenses and other minimal closing costs associated with this type of structure. The lease purchase agreement may not exceed 15 years (commencing upon completion of the construction work), or 20 years where a combined heat and power or cogeneration plant is included in the project. The primary benefits of a lease are lower rates and the acquisition of essential use property without creating debt.

Under a lease there is typically a single investor. The lease may have non-appropriation language that allows the District to access low tax-exempt rates. Some previous customers have chosen to remove the non-appropriation language which has resulted in lower competitive rates.

Repayment of the lease payments is tailored to meet the requirements of the District. Payments are typically scheduled to commence after the construction is complete and acceptance of the project has been received by the Haddonfield School District. Typically, payment terms are structured so there is no up-front capital expense to the District and payments are aligned within your cash flow and fiscal limits.

Certificates of Participation (COP's)

Certificates of Participation are another form of a lease purchase agreement with the differentiating factor being that there are multiple investors participating in the purchase of the lease. COP's require financial disclosure and are typically utilized on higher value projects where one investor does not have the capacity to hold a high value lease for a single customer.

Energy Savings Obligations

Energy Savings Obligations can be issued as refunding bonds in accordance with the requirements of N.J.S.A 40A:11-4.6(c)(3). These bonds may be funded through appropriation for the utility services in the annual budget of the contract unit and may be issued as refunding bonds pursuant to N.J.S.40A:2-52 et seq., including the issuance of bond anticipation notes as may be necessary, provided that all such bonds and notes mature within the periods authorized for such energy savings obligations. Energy savings obligations may be issued either through the contracting unit or another public agency authorized to undertake financing on behalf of the unit but does not require bond referendum.

SECTION E
MEASUREMENT & VERIFICATION AND MAINTENANCE PLAN

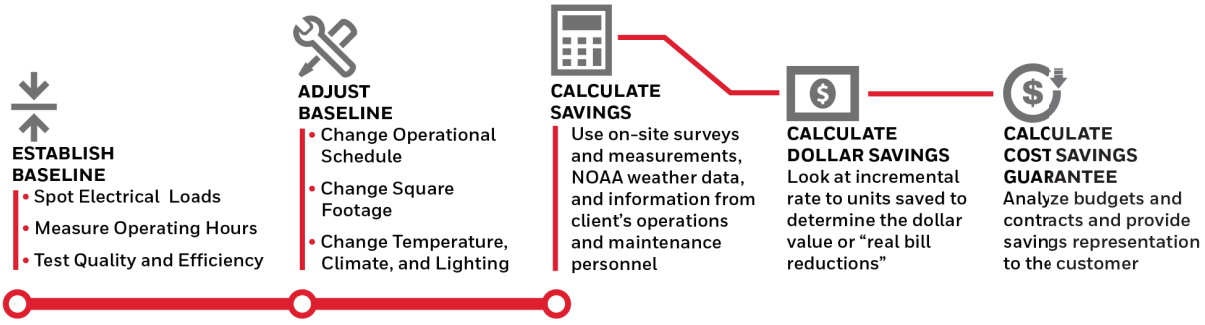
SECTION E — MEASUREMENT & VERIFICATION AND MAINTENANCE PLAN

1. BASELINE

The purpose for establishing a baseline for an energy performance project is to accurately predict what the energy consumption and costs would have been as if the energy project was never completed. The baseline can then be used to measure the improvement in efficiency and determine the overall energy savings of the project. Since the energy consumption of all facilities is somewhat affected by variable weather conditions, a baseline for heating and cooling systems is typically dependent on degree-days or outside temperature. A baseline also needs to incorporate changes in facility use, such as a change in hours of operation or increased levels of outside air. Once again, if these changes would have occurred in the absence of the energy project, they should be incorporated into the project's baseline.

Honeywell calculated the baseline based on the systems and operating conditions as they currently exist prior to the pandemic. The baseline was established from 3/2021-2/2022 in accordance with BPU guidelines as being considered a pre-pandemic baseline. Baseline development is most accurate if specific measurements are taken on equipment over a period of time (early in the audit phase) to determine actual kW, kWh, oil and gas consumption, cfm, gpm, hours of use, etc. A summary of some of the methods, which was used by Honeywell to establish baselines and support, calculated savings are listed below.

1. Spot measurements of electrical loads such as lighting, fan and pump motors, chillers, electric heat, etc.
2. Measurement of equipment operating hours using electric data recorders.
3. Measurement of existing operating conditions using data recorders for space temperature and humidity, air handler temperatures (mixed, return, cooling, and heating coil discharges), and space occupancy using lighting loggers.



4. Spot measurement for boiler efficiencies, water use.
5. Running measurements of chiller operation, including simultaneous measurement of input kWh or steam flow, and chilled water supply and return temperatures and flow (gpm).
6. Records of operating conditions from building management systems and utility-grade meters.

The data from the above is used to calculate existing energy use, which is then reconciled with current facility utility bills, and adjusted as required to provide a mutually agreed baseline.

To provide valid savings evaluations, Honeywell's maintains a significant inventory of metering equipment utilized by its auditors and Energy Engineers to ascertain critical data about the operation of the facility.

Typically, auditors use the following equipment for their onsite measurements:

1. Recording and instantaneous power and harmonic analyzers.
2. Data loggers for pressures, temperatures, flow rates, humidity, and CO2.
3. Lighting level and recording profile/run-hour and occupancy meters.
4. Multimeters, handheld kW meters.
5. Combustion analyzers.
6. Ultrasonic flow meters.
7. Infrared thermometers

The ECMs installed in many projects allow for energy savings to be identified by direct metering or a combination of metering and calculations with accepted assumptions. In the case of lighting, for example, it is relatively easy to meter representative samples of unique fixture types, both before and after a retrofit, to determine the power consumption difference in Watts. When multiplied by the quantity of each fixture type, the total connected load reduction can be derived. In combination with run time assumptions, or meters, the electrical reduction can be accurately determined. Where possible, direct measurement of ECMs during construction (before and after the retrofit) coupled with energy savings calculations is a method considered to be very accurate and cost-effective.

Due to the nature of some ECMs, or when a combination of ECMs is installed, individual (discrete) metering may not be either possible or able to fully document a baseline and calculate savings. Many of these situations can be handled by combining results from metering along with either engineering-based calculations or output from nationally recognized building simulation programs such as DOE II, ASEAM, TRACE or HAP. This method would be used for ECMs such as night setback, and where no other ECMs have significant interaction with the setback measure.

Formulas exercised in energy savings calculations follow the laws of physics, and many are included in the ASHRAE Handbook of Fundamentals. However, such calculations (i.e., equipment operation profiles) must be tempered by experience, past retrofit practice, and expectations of future operating conditions to arrive at achievable values in practice. The result is a coupled project where the final savings are equal to or greater than anticipated.

2. ADJUSTMENT TO BASELINE METHODOLOGY

The methodology for establishing and adjusting the baseline is determined by the characteristics of the facility, the conservation technology being installed, the technology being replaced, the type of measurement and verification the Haddonfield School District requires and the needs of the District for future changes in facility use.

The purpose of this flexible approach is to make the most accurate possible measurement of the changes in energy uses that are specifically attributable to the installed ECMs. This creates the ability over the life of the contract to continue measuring only savings achieved by the ECM and leaves the District free to make future changes to the building or systems without affecting the savings agreement. It also necessitates fewer provisions for making adjustments to the baseline.

Modifications to the energy baseline or savings will be made for any of the following:

3. ENERGY SAVINGS CALCULATIONS

In calculating energy savings, Honeywell's highly experienced audit staff uses onsite surveys and measurements, National Oceanic and Atmospheric Administration weather data, detailed discussions with the client's operations and maintenance personnel and engineers, utility records, and other sources to ensure accurate energy, water, and O&M savings.

Typically, the following data is gathered:

- Local weather data.
- Utility bills and sub-metered consumption trends.
- Utility rate structure.
- Facility use and occupancy data.
- Internal equipment loads.
- Interviews of operations and maintenance staff and management.
- Building construction, age, use and layout.
- Schematics of energy and water distribution systems.
- Identification and inventory of HVAC equipment.
- Identification and inventory of process equipment.
- Design, configuration, and operating characteristics of HVAC systems.
- Design, configuration, and operating characteristics of process systems.
- Control strategies and sequences of operation for HVAC and other process equipment.
- Identification and count of all lighting fixtures and determination of power consumption for each type.
- Identification and inventory of lighting control methods.
- Measurement of foot-candle levels at sample locations.
- Power quality and harmonics, power factor.
- Indoor air quality issues.

Calculating the units of energy saved is a critical measure of energy efficiency improvements, but it does not indicate the actual dollars saved. To do this, Honeywell has established the base rates that will act as "floor" rates in calculating the savings. These are usually the rates that are in effect at the time of the start of the contract or rates used for audit estimated savings.

The equation below will be used to calculate the annual savings in dollars.

$$\text{Annual Savings (\$)} = \sum_{m=1}^{12} \{(Rate_{kWH,Base} \times kWH_{saved,m}) + (Rate_{fuel\ oil,\ Base} \times Fuel\ Oil_{saved,\ gal,\ m}) + (Rate_{Steam,\ Base} \times Steam_{Saved,\ klbs,\ m}) + (Rate_{NG} \times NG_{Saved,\ MCF,\ m})\} + (Agreed\ (\$))$$

Where

Rate$_{kWH,Base}$= defined base rate for kWh consumption
kWh$_{saved,m}$= calculated kWh savings for month *m*

Rate$_{Fuel\ Oil\ Base}$= defined base rate for fuel Oil Savings (XX/gal.)
Fuel Oil$_{saved,m}$= calculated chilled water savings in gal. for month *m*

Rate$_{Steam,\ Base}$= defined base rate for steam consumption ($XX/MMBtu.)
Steam$_{saved,m}$= calculated steam savings in MMBtu. for month *m*

Rate$_{NG,\ Base}$= defined base rate for natural gas consumption ($XX/Therm)
NG$_{saved,m}$= calculated natural gas savings in Therms for month *m*

Agreed($)= Annual savings in dollars (water, sewer, maintenance, etc.)

Honeywell assigns dollar values to the true incremental value of savings for energy and water. In other words, we do not combine for example, demand and consumptions numbers so that there is an average value to savings. Honeywell looks at each incremental rate to units saved to properly determine the value (dollar) to the Haddonfield School District or “real bill reductions.” As noted in the cash flow, energy escalation rates will be established in accordance with New Jersey Board of Public Utility guidelines.

Based on this, Honeywell has reviewed all utility bills (hourly data), tariffs, special contracts, and commodity contracts to develop the incremental value (costs) of each utility.

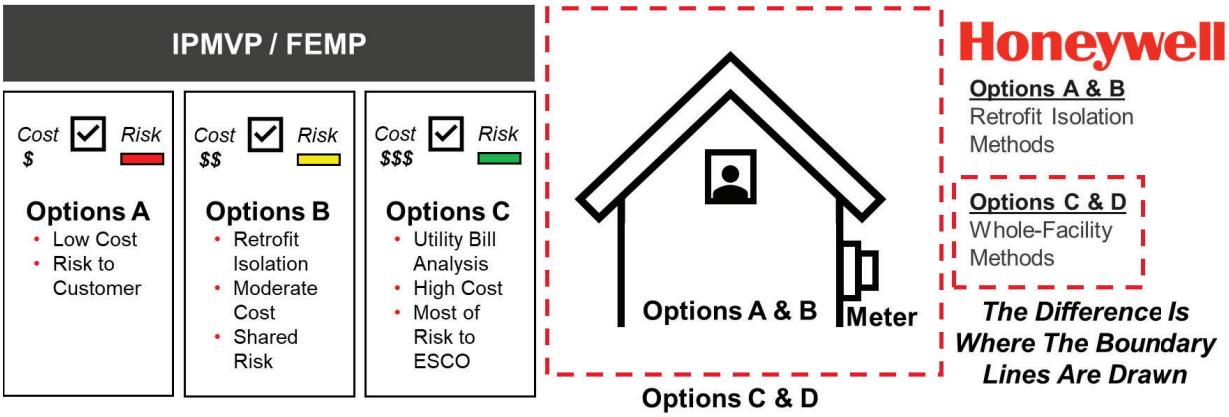
The O&M savings is typically a function of existing the District’s budgets (labor & direct costs), maintenance contracts and operations (supplier) contracts. Honeywell has analyzed the information to provide a conservative savings representation for the District’s review and acceptance. The information will include all calculations and assumptions.

4. MEASUREMENT & VERIFICATION

The purpose of performing any monitoring and verification is to establish an agreed upon process that provides the customer both a level of satisfaction that the improvements have been delivered and ongoing information as to their operation and performance. Additionally, this effort will be used to assess the actual dollars of savings versus the guarantee level.

It is essential for the success of this program that Honeywell and the Haddonfield School District agree on a mutually acceptable methodology for measuring and verifying energy savings that are attributable to the energy conservation measures (ECMs) Honeywell installs. This M&V plan provides the procedures to document the energy and cost savings of each of the proposed ECMs.

The plan for monitoring and verifying energy savings for the proposed ECMs is based on the methods described in the ***International Performance Measurement and Verification Protocol (IPMVP)***[1]. Our approach to M&V is directly consistent with, and in compliance with, the IPMVP. This protocol provides a framework for the most widely accepted and used M&V methods by the industry.



Engineering calculations of energy and cost savings for the project are based on operating parameters (such as weather, temperature settings, run hours, occupancy patterns, and space usage) and equipment performance characteristics. The M&V plan uses the operating parameters established in the baseline for all savings calculations during the term of the project. The intent of the M&V plan is to verify that the ECMs installed by Honeywell will provide the expected energy savings. Therefore, Honeywell will collect data and relative information during the post-retrofit period to demonstrate that the installed equipment is performing at expected levels. It is assumed that the Haddonfield School District will continue to be a dynamic institution adding or renovating buildings and desiring to retain the right to set comfort and operating characteristics. To accommodate this, Honeywell will develop its M&V plan in a way that allows the Haddonfield School District to adapt to the demands of future campus growth and changes without the need for the District and Honeywell to negotiate energy baseline adjustments.

Our typical M&V plan will utilize broadband Internet access to the appropriate the District's control interfaces to both confirm operating status and to download trend data to verify proper equipment maintenance.

[1] www.ipmvp.org.

One year after the commencement date of the ECMs, Honeywell will submit a report verifying and calculating the energy and cost savings for the first year. This report will be submitted for facility review and approval. For the remaining contract term, Honeywell will provide annual reports. These reports will include results of inspections of the installed equipment/systems, energy and cost savings, and recommendations to provide optimum energy performance.

All permanent measurement equipment will be purchased new with a calibration certificate from the manufacturer. The power multi-meter and the TSI multi-meter will be calibrated annually before using them in the annual inspection.

M&V Options

The IPMVP guidelines classify the M&V procedures into four categories, Options A, B, C and D. As shown in the table below, these options differ in their approach to the level of complexity of the M&V procedures.

M&V Option	Performance Verification Techniques
Option A Verifying that the measure has the potential to perform and to generate savings.	**Option A** is appropriate for ECMs that have energy use that can be readily quantified, such as the use of high efficiency lighting fixtures, high efficiency constant speed motors, and other standard engineering calculations. Engineering calculations before and after installation spot measurements and use of EMS data points with stipulated values.
Option B Verifying that the measure has the potential to perform and verifying actual performance by end use.	**Option B** is appropriate for ECMs that require periodic or on-going measurements to quantify energy use, such as the use of variable frequency drives on pump or fan motors. Engineering calculations with metering and monitoring strategy throughout term of the contract.
Option C Verifying that the measure has the potential to perform and verifying actual performance (whole building analysis.)	**Option C** is used for ECMs for which the energy use or energy savings cannot be measured directly, such as building envelope modifications. Option C is based on the use of utility meters to quantify building energy use. Utility meter billing analysis-using techniques from simple comparison to multivariable regression analysis.
Option D Verifying actual performance and savings through simulation of facility components and/or the whole facility	**Option D** is used for ECMs for which the energy use or energy savings cannot be measured directly, or savings for individual ECMs are heavily interdependent. Calibrated building simulation is used to separate the energy savings attributable to each ECM. Calibrated energy simulation/modeling; calibrated with hourly or monthly utility billing data and/or end-use metering.

In general,

> *ECM Energy Savings = Baseline Energy Use - Post-Installation Energy Use*
>
> and
>
> *Energy Cost savings ($) = Total Energy Savings x Contractual Energy Rates*

Exceptions to this simple equation are as follows:

- Projects where an on/off M&V method is used. For example, after a new energy management system is installed, control features are turned off for a set period of time to recreate baseline conditions. Thus, savings are determined after installation by comparing energy use with and without the control features activated.
- Since energy use at a facility is rarely, if ever, constant, another way to define M&V is as a comparison of a facility's post-installation energy use with its usage if the ECM or system had not been installed. This considers situations in which baseline energy use must be adjusted to account for changing conditions, such as changes in facility operation, occupancy, or use or external factors such as weather.

Post-Retrofit M&V Activities

There are two components associated with M&V of performance contract projects:

1. Verifying the potential of the ECM to generate savings also stated as confirming that the proper equipment/systems were installed, are performing to specification and have the potential to generate the predicted savings.
2. Determining/verify energy savings achieved by the installed ECM(s).

Verifying The Potential To Generate Savings

Verifying baseline and post-installation conditions involves inspections (or observations), spot measurements, and/or commissioning activities. Commissioning includes the following activities:

- Documentation of ECM or system design assumptions
- Documentation of the ECM or system design intent for use by contractors, agencies, and operators
- Functional performance testing and documentation necessary for evaluating the ECM or system for acceptance
- Adjusting the ECM or system to meet actual needs within the capability of the system

Post-Installation Verification

Post-installation M&V verification will be conducted by both Honeywell and the Client to ensure that the proper equipment/systems that were installed are operating correctly and have the potential to generate the predicted savings. Verification methods may include surveys, inspections, and/or spot or short-term metering.

Regular Interval Post-Installation Verification

At least annually, Honeywell will verify that the installed equipment/systems have been properly maintained, continue to operate correctly, and continue to have the potential to generate the predicted savings. Savings report for all the installed ECMs will be submitted each year after the acceptance date of the work performed by Honeywell.

Computation Of Energy Savings

After the ECMs are installed, energy and cost savings will be determined annually by Honeywell in accordance with an agreed-upon M&V approach, as defined in a project-specific M&V plan.

Construction/Interim Savings

Construction or Interim savings are usually measured by using the same methodology as described in the detail M&V plan for each ECM. The start and the completion time for each ECM must be agreed to between Honeywell and the Haddonfield School District.

Electricity and thermal savings from the ECMs where no detailed long-term data is required to be collected will be stipulated and will be based on the starting and the final completion dates and verification of the operation of the ECMs. For other ECMs where long-term data collection is required by the M&V plan, data will be used to calculate the savings using the same equations as described in the detail plan. For example, to calculate electricity savings for the installation of a VFD, the kW is spot measured at a set speed for selected motors through a sampling plan. The measured kW is subtracted from the baseline kW to calculating the savings. Thermal savings are tied to the electrical savings in the manner described in the detail M&V plan. The results are extrapolated to cover all the VFDs installed by Honeywell.

The savings for each of the monitored VFD is calculated on an interval basis as follows:

$kW_{Saved} = (kW_{Base} - kW_{Spot\ Measured})$

kWh_{Saved} = Estimated operating hours during the interim period * kW_{Saved}

The total kWh savings is the sum of the kWh_{Saved} for all the installed VFDs.

1. Changes in the number of days in the annual review cycle.
2. Changes in the square footage of the facilities.
3. Changes in the operational schedules of the facilities.
4. Changes in facility indoor temperatures.
5. Significant changes in climate.
6. Significant changes in the amount of equipment or lighting utilized in the facility.

Examples of situations where the baseline needs to be adjusted are: i) changes in the amount of space being air conditioned, ii) changes in auxiliary systems (towers, pumps, etc.) and iii) changes in occupancy or schedule. If the baseline conditions for these factors are not well documented it becomes difficult, if not impossible, to properly adjust them when they change and require changes to payment calculations. To compensate for any addition and deletion of buildings and impact on the baseline model, An M&V report should use sound technical methodologies to adjust the baseline. An example would be to add or delete building energy impact via the calculated cooling load in tons as a percentage of the existing campus tonnage baseline or use indices like W/ft2 and Btu/ft2 to calculate the energy consumption of the building and then add or subtract the energy usage to or from the baseline energy consumption.

5. SITE SPECIFIC M&V PLAN

ECM # and Name	Summary of ECM	M&V Methodology / Recommendation	Description of M&V – Pre- and Post-Process
1A LED Lighting Upgrades	Upgrade Lighting systems: ▪ Re-lamp/Re-ballast T8/T12 to LED, ▪ Incandescent to LED ▪ Metal Halide and Sodium Vapor to LED High Bays	**Option A** ▪ Pre and Post measurements ▪ Line by Line scope and engineering calculations	▪ Pre-M&V: Measurement of kW for 5% sample fixtures in each category ▪ Data log usage hours ▪ Data Log occupancy schedules ▪ Update Line by Line scope with measured kW and usage hours ▪ Post M&V: Measurement of kW for 5% sample fixtures in each category ▪ Usage Hours to remain same ▪ Occupancy schedules to remain same ▪ Energy Savings: Update Line by Line scope with measured kW and usage hours and compare to pre-retrofit calculated savings
1B Stadium Lighting	Upgrade Stadium lighting	**Option A** ▪ Pre and Post measurements ▪ Line by Line scope and engineering calculations	▪ Pre M&V: Measurement of kW for 5% sample fixtures in each category ▪ Data log usage hours ▪ Data Log occupancy schedules ▪ Update Line by Line scope with measured kW and usage hours ▪ Post M&V: Measurement of kW for 5% sample fixtures in each category ▪ Usage Hours to remain same ▪ Occupancy schedules to remain same ▪ Energy Savings: Update Line by Line scope with measured kW and usage hours and compare to pre-retrofit calculated savings
1C De-Stratification Fans w/ UV Disinfection	Install De-Stratification fans in Gymnasiums to minimize stratification of hot air and maintain hot air flow below the fan level	**Option A** ▪ Electric energy savings - Engineering calculations based on programmed parameters. **Option C** ▪ Fuel Savings ▪ Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify existing operating parameters match the baseline calculation assumptions ▪ Post M&V: Verify that systems are installed as specified and controls are programmed to match the savings assumptions ▪ Electric Energy: Verify savings based on programmed parameters and engineering calculations ▪ Fuel: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days

ECM # and Name	Summary of ECM	M&V Methodology / Recommendation	Description of M&V – Pre- and Post-Process
2A HVAC Unit Upgrades	Replace antiquated HVAC Units with new high efficiency Units.	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data for the existing and replacement units **Option C** ▪ Fuel Savings Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify manufacturer provided data for existing unit efficiency (EER) ▪ Post M&V: Verify manufacturer provided data for new rooftop unit (EER) – verify the new equipment and controls are installed and commissioned as recommended by manufacturer ▪ Electric Energy: Verify savings based on programmed parameters and engineering calculations ▪ Fuel: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days
2B Domestic Hot Water Heater Replacements	Replace heaters in select locations to handle base load	**Option C** ▪ Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Baseline annual fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days ▪ Perform combustion efficiency test on boilers ▪ Post M&V: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days ▪ Perform efficiency test on replaced boilers to ensure operating conditions are maintained
2C Boiler Replacements	Replace boilers in select locations to handle base load	**Option C** Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Baseline annual fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days ▪ Perform combustion efficiency test on boilers ▪ Post M&V: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days ▪ Perform efficiency test on replaced boilers to ensure operating conditions are maintained
2D Split System Upgrades	Replace select split systems with new high efficiency units.	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data for the existing and replacement Units	▪ Pre-M&V: Verify manufacturer provided data for existing unit efficiency (EER) ▪ Post M&V: Verify manufacturer provided data for new split system unit (EER) – verify the new equipment and controls are installed and commissioned as recommended by manufacturer

ECM # and Name	Summary of ECM	M&V Methodology / Recommendation	Description of M&V – Pre- and Post-Process
2E Premium Efficiency Motors and VFDs	Install VFDs on select pumps to operate the pump motors in response to the system load. Replace motors with new premium efficiency motors.	**Option A** ▪ Engineering calculations for VFDs following pump affinity laws. ▪ Engineering calculations based on nameplate and manufacturer supplied data for the existing and replacement motors	▪ Pre-M&V: Verify manufacturer provided data for the pump performance data and motor efficiencies. ▪ Post M&V: Obtain trend data for VFD operation from the BMS system to verify baseline calculation assumptions on system loads ▪ Verify efficiency of new motors ▪ Verify manufacturer provided data for new VFDs – verify the new equipment and controls are installed and commissioned as recommended by manufacturer
2F Chiller Replacements	Replace antiquated Chiller with new efficient unit.	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data for the existing and replacement Units	▪ Pre-M&V: Verify manufacturer provided data for existing units efficiency ▪ Post M&V: Verify manufacturer provided data for new units verify the new equipment and controls are installed and commissioned as recommended by manufacturer
2G Cooling Tower Replacements	Replace Cooling Tower with new efficient unit.	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data for the existing and replacement Units	▪ Pre-M&V: Verify manufacturer provided data for existing units efficiency ▪ Post M&V: Verify manufacturer provided data for new units verify the new equipment and controls are installed and commissioned as recommended by manufacturer
2H Boiler Burner Controls	Install advanced combustion controls, on existing burners.	**Option C** ▪ Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Baseline annual fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days ▪ Perform combustion efficiency test on boilers ▪ Post M&V: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days ▪ Perform efficiency test on replaced boilers to ensure operating conditions are maintained
2I Unit ventilator/Condensing Unit Replacements	Replace antiquated Unit Ventilators with Condensing Units.	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data for the existing and replacement units **Option C** ▪ Fuel Savings Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify manufacturer provided data for existing units efficiency ▪ Post M&V: Verify manufacturer provided data for new units verify the new equipment and controls are installed and commissioned as recommended by manufacturer ▪ Electric Energy: Verify savings based on programmed parameters and engineering calculations ▪ Fuel: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days

ECM # and Name	Summary of ECM	M&V Methodology / Recommendation	Description of M&V – Pre- and Post-Process
2J Unit Ventilator Replacements with VRF	Replace antiquated Unit Ventilators with VRF system.	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data for the existing and replacement units **Option C** ▪ Fuel Savings Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify manufacturer provided data for existing units efficiency ▪ Post M&V: Verify manufacturer provided data for new units verify the new equipment and controls are installed and commissioned as recommended by manufacturer ▪ Electric Energy: Verify savings based on programmed parameters and engineering calculations ▪ Fuel: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days
2K Gym Floor Replacements	Replace mercury-containing gym floor.	**Option A** ▪ Electric energy savings - Engineering calculations based on programmed parameters. **Option C** ▪ Fuel Savings Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify existing operating parameters match the baseline calculation assumptions ▪ Post M&V: Verify that systems are installed as specified and controls are programmed to match the savings assumptions ▪ Electric Energy: Verify savings based on programmed parameters and engineering calculations ▪ Fuel: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days
2L Pipe Insulation	Insulate Various Piping sizes and runs to prevent thermal losses.	**Option C** ▪ Fuel Savings Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify manufacturer provided data for existing units efficiency ▪ Post M&V: Verify manufacturer provided data for new material verify the new material is installed and commissioned as recommended by manufacturer
2M Energy Recovery Unit Replacements	Replace Energy Recovery Units with new high efficiency Units.	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data for the existing and replacement units **Option C** ▪ Fuel Savings Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify manufacturer provided data for existing unit efficiency (EER) ▪ Post M&V: Verify manufacturer provided data for new rooftop unit (EER) – verify the new equipment and controls are installed and commissioned as recommended by manufacturer ▪ Electric Energy: Verify savings based on programmed parameters and engineering calculations ▪ Fuel: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days

ECM # and Name	Summary of ECM	M&V Methodology / Recommendation	Description of M&V – Pre- and Post-Process
3A Building Management Controls	Upgrade Building Management Systems to DDC and integrate all systems to a central platform. Retro-commissioning existing control systems.	**Option A** ▪ Electric energy savings - Engineering calculations based on programmed parameters. **Option C** ▪ Fuel Savings Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify existing operating parameters match the baseline calculation assumptions ▪ Post M&V: Verify that systems are installed as specified and controls are programmed to match the savings assumptions ▪ Electric Energy: Verify savings based on programmed parameters and engineering calculations ▪ Fuel: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days
3B Building Sustainability Manager HBSM	Install Forge Energy Optimization system	**Option A** ▪ Electric energy savings - Engineering calculations based on programmed parameters. **Option C** ▪ Fuel Savings Utility Bill Comparison for all fuel related measures	▪ Pre-M&V: Verify existing operating parameters match the baseline calculation assumptions ▪ Post M&V: Verify that systems are installed as specified and controls are programmed to match the savings assumptions ▪ Electric Energy: Verify savings based on programmed parameters and engineering calculations ▪ Fuel: Compare post installation M&V fuel cost based on fuel billing data and Metrix tuned to normalize to heating degree days
4A Building Envelope Improvements	Install weather stripping on doors, seal roof wall joints and roof penetrations	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data **Option C** ▪ Utility Bill Comparison for fuel related measures	▪ Pre-M&V: Verify existing conditions ▪ Post M&V: Visual inspection per scope of work
4B Roof Replacements	Replace existing roofs.	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data **Option C** ▪ Utility Bill Comparison for fuel related measures	▪ Pre-M&V: Verify existing conditions ▪ Post M&V: Visual inspection per scope of work
5A Cogeneration CHP	Install Cogeneration units	**Option A** ▪ Engineering calculations based on nameplate and manufacturer supplied data for the new unit.	▪ Pre-M&V: Verify manufacturer provided data for existing units efficiency ▪ Post M&V: Verify manufacturer provided data for new units verify the new equipment and controls are installed and commissioned as recommended by manufacturer

ECM # and Name	Summary of ECM	M&V Methodology / Recommendation	Description of M&V – Pre- and Post-Process
6A Energy Sourcing	Proactively purchase electricity and natural gas supply with competitive price.	N/A	▪ Pre-M&V: N/A ▪ Post M&V: N/A
6B Remote Solar	Purchase solar energy virtually from the Community Solar Program	N/A	▪ Pre-M&V: N/A ▪ Post M&V: N/A
6C Solar PPA	Install Solar Power using Power Purchase Agreement	N/A	▪ Pre-M&V: N/A ▪ Post M&V: N/A
6D Solar PV Purchase	Install Solar PV System owned by District.	N/A	▪ Pre-M&V: N/A ▪ Post M&V: N/A

6. RECOMMENDED PREVENTIVE MAINTENANCE SERVICES

Per the NJ ESIP program, all services are required to be bid by the Haddonfield School District for services as desired. Based on Honeywell's vast service organization, we are uniquely qualified to develop design specification for the public bidding per 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 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 Haddonfield 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 backup 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 CONTROLS

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 shutdown.

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.

APPENDICES

APPENDICES

APPENDIX 1: LOCAL GOVERNMENT ENERGY AUDITS

Please see Appendix 1 provided as a separate accompaniment to this document entitled:
Appendix 1: Local Government Energy Audits

APPENDIX 2: ECM CALCULATIONS

Please see Appendix 2 provided as a separate accompaniment to this document entitled:
Appendix 2- ECM Calculations

APPENDIX 3: EQUIPMENT CUTSHEETS

Please see Appendix 3 provided as a separate accompaniment to this document entitled:
Appendix 3 - Equipment Cutsheets

APPENDIX 4: LIGHTING LINE BY LINE

Please see Appendix 4 provided as a separate accompaniment to this document entitled:
Appendix 4 -Lighting Line by Line

APPENDIX 5: REQUIRED FORMS & OMNIA COOPERATIVE / NJ PROCUREMENT DOCUMENTATION

Per the LFN, the Haddonfield School District must verify the selected vendor complies with applicable New Jersey procurement documentation requirements by submitting the following required forms.

The following forms are included:

- **New Jersey Business Registration Certificate** for the contractor and any subcontractors (i.e., copy of certificate)

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	HONEYWELL INTERNATIONAL INC.
Trade Name:	ADI GLOBAL DISTRIBUTION
Address:	101 COLUMBIA RD MORRISTOWN, NJ 07960-4640
Certificate Number:	0073401
Effective Date:	August 19, 1985
Date of Issuance:	August 25, 2021

For Office Use Only:

20210825150427681

Certification 137

CERTIFICATE OF EMPLOYEE INFORMATION REPORT

RENEWAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of 15-MAY-2021 to 15-MAY-2024

HONEYWELL INTERNATIONAL, INC.
115 TABOR ROAD
MORRISPLAINS NJ 07950

ELIZABETH MAHER MUOIO
State Treasurer

- **Statement of Corporate Ownership** (an original form prepared for the contracting agency awarding the contract)

EXHIBIT B:

OWNERSHIP DISCLOSURE CERTIFICATION TO BE SUBMITTED WITH PROPOSAL

In order to conform with N.J.S.A.52:25-24.2, all corporations or partnerships shall provide the following information:

1. Name of Firm: Honeywell International Inc.
2. Type of Business Organization (Check appropriate type)

Partnership ____ × Corporation ____ Sole Proprietorship ____
Limited Partnership ____ Limited Liability Corporation ____ Limited Liability Partnership ____
Subchapter S Corporation ____

3. Name of State in which Incorporated: Delaware

The following individuals own ten percent (10%) or more of any class stock in the corporation or are ten percent (10%) or more Partners in the Firm:

NAME	ADDRESS	TITLE	PERCENTAGE
Honeywell is an international publice operation and no one individual owns more that 10 %.			

Or, I certify that no one stockholder or partner owns 10% or more of the issued and outstanding stock or interest in the business entity.

IF ANY OF THE AFOREMENTIONED STOCKHOLDERS ARE A CORPORATION, WHEREBY THEY HOLD 10% (TEN PERCENT) OR MORE OF ANY CLASS STOCK IN BIDDING CORPORATION, THEY SHALL ALSO PROVIDE THE INFORMATION REQUESTED ABOVE.

The above information is true and correct to the best of my knowledge.

(Signature) Caroline Jackson

(Name) Caroline Jackson

(Title) Sr Business Consultant

(Address) 534 Fellowship Road, Mount Laurel, NJ 08054

Subscribed and sworn to before me
This 6 day of Aug, 2024.
(Seal) Notary Public of New Jersey/
Specify Other State
My commission Expires 12/22, 2025.
Cathleen A Foote

NJ ESIP RFP Education Template: rev 7.1.22

CATHLEEN A. FOOTE
NOTARY PUBLIC OF NEW JERSEY
Commission # 2269845
My Commission Expires 12/22/2025

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- **Public Contract EEO Compliance** (Employee Information Report form or proof of participation in a federally approved affirmative action program)

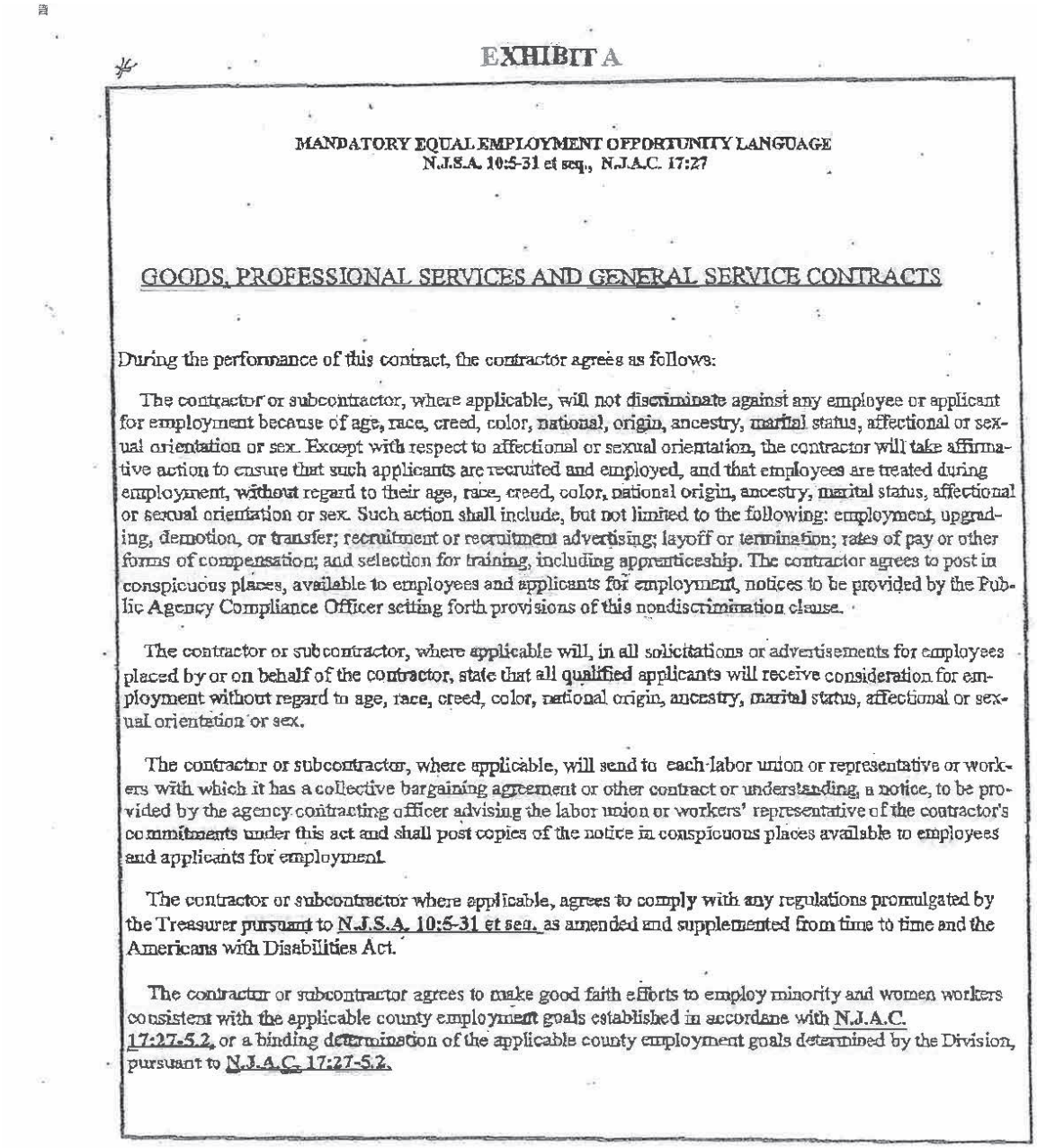

EXHIBIT A

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE
N.J.S.A. 10:5-31 et seq., N.J.A.C. 17:27

GOODS, PROFESSIONAL SERVICES AND GENERAL SERVICE CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national, origin, ancestry, marital status, affectional or sexual orientation or sex. Except with respect to affectional or sexual orientation, the contractor will take affirmative action to ensure that such applicants are recruited and employed, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation or sex. Such action shall include, but not limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation or sex.

The contractor or subcontractor, where applicable, will send to each labor union or representative or workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et seq. as amended and supplemented from time to time and the Americans with Disabilities Act.

The contractor or subcontractor agrees to make good faith efforts to employ minority and women workers consistent with the applicable county employment goals established in accordane with N.J.A.C. 17:27-5.2, or a binding determination of the applicable county employment goals determined by the Division, pursuant to N.J.A.C. 17:27-5.2.

EXHIBIT A (*Cont*)

The contractor or subcontractor agrees to inform in writing its appropriate recruitment agencies including, but not limited to, employment agencies, placement bureaus, colleges, universities, labor unions, that it does not discriminate on the basis of age, creed, color, national origin, ancestry, marital status, affectional or sexual orientation or sex, and that it will discontinue the use of any recruitment agency which engages in direct or indirect discriminatory practices.

The contractor or subcontractor agrees to revise any of its testing procedures, if necessary, to assure that all personal testing conforms with the principles of job-related testing, as established by the statutes and court decisions of the State of New Jersey and as established by applicable Federal law and applicable Federal court decisions.

In conforming with the applicable employment goals, the contractor or subcontractor agrees to review all procedures relating to transfer, upgrading, downgrading and layoff to ensure that all such actions are taken without regard to age, creed, color, national origin, ancestry, marital status, affectional or sexual orientation or sex, consistent with the statutes and court decisions of the State of New Jersey, and applicable Federal law and applicable Federal court decisions.

The contractor and its subcontractor shall furnish such reports or other documents to the Division of Contract Compliance & EEO as may be requested by the Division from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Contract Compliance & EEO for conducting a compliance investigation pursuant **to Subchapter 10 of the Administrative Code at N.J.A.C.17:27.**

Caroline Jackson,
Sr. Bus. Consultant
Name of Vendor is aware of our obligation to the State of New Jersey pursuant to NJSA 10:5-31

Caroline Jackson
Signature of Highest Official

11

Honeywell
THE POWER OF CONNECTED

Country(ies): U.S.	Policy Title: EQUAL EMPLOYMENT OPPORTUNITY AND AFFIRMATIVE ACTION	Effective Date: 01/01/2000
Policy Number: 2060		Revision Date: 10/01/2017

PURPOSE

This Policy sets forth Honeywell's Equal Employment Opportunity ("EEO") and Affirmative Action statement.

SCOPE AND ELIGIBILITY

Honeywell's employment practices will conform to both the spirit and the letter of Federal, state and local laws and regulations regarding nondiscrimination in employment. This Policy applies to all Honeywell sites within the United States, other than National Technology and Engineering Solutions of Sandia, LLC sites.

POLICY

1. HIRING STATEMENT

All applicants for employment with Honeywell will be considered without regard to sex, race, color, ethnicity, affectional or sexual orientation, gender identity, physical or mental disability, genetic information, age, pregnancy, religion/creed, marital status, civil union status, protected veteran status, national origin, citizenship or any other legally protected status.

The Human Resources leaders at each Company site ("HR Site Leaders") are responsible for monitoring, at least annually, the selection process for all positions filled at their site. They accomplish this by determining whether there are selection disparities and, if so, whether impediments to equal employment opportunity exist. If impediments are not based on legitimate business practices, the HR Site HR Leaders are responsible for removing such impediments.

2. EMPLOYMENT ACTIONS

There shall be no discrimination with regard to sex, race, color, ethnicity, affectional or sexual orientation, gender identity, physical or mental disability, genetic information, age, pregnancy, religion/creed, marital status, civil union status, protected veteran status national origin, citizenship or any other legally protected status in any employment actions including, but not limited to, promotions, demotions, transfers, layoffs or terminations, compensation, use of facilities and selection for training or related programs.

HR Site Leaders are responsible for monitoring, at least annually, all employment actions including, but not limited to, promotions, demotions, transfers, layoffs or terminations, compensation, use of facilities and selection for training or related programs at their sites. They accomplish this by determining whether there are disparities and, if so, whether impediments to equal employment opportunity exist. If impediments are not based on legitimate business practices, the HR Site Leaders are responsible for removing such impediments.

2. WORK ENVIRONMENT

It is the Company's policy to maintain a work environment that fosters respect for all employees. A good working environment includes freedom from harassment based on sex, race, color, ethnicity, affectional or sexual orientation, gender identity, physical or mental disability, genetic information, age, pregnancy, religion/creed, marital status, civil union status, protected veteran status, national origin, citizenship or any other legally protected status.

HR Site Leaders are responsible for posting the policy statement attached hereto as Exhibit A or, in the case of the Company's Minnesota locations, Exhibit B.

3. GOVERNMENT CONTRACT COMPLIANCE

Honeywell is a U.S. Federal Government contractor and subcontractor subject to Executive Order ("EO") 11246, Section 4212 of the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended ("Section 4212"), and Section 503 of the Rehabilitation Act of 1973, as amended ("Section 503"). It is Honeywell's policy to take affirmative action to employ, advance in employment, and otherwise treat as qualified minorities, women, protected veterans, and individuals with disabilities without regard to their race/ ethnicity, sex, protected veteran status, or physical or mental disability. Honeywell will also provide reasonable accommodation to the known physical or mental limitations of an otherwise qualified employee or applicant for employment, unless the accommodation would impose undue hardship on the operation of the Company's business.

HR Site Leaders are responsible for making the non-confidential portions of their site's affirmative action plans ("AAPs") for individuals with disabilities and protected veterans available to applicants and employees. The non-confidential portions of the AAPs are available to applicants and employees upon request to the HR Site Leader during the working hours of 9:00 AM through 4:30 PM.

4. NO RETALIATION

Honeywell prohibits retaliation and will not tolerate harassment, intimidation, threats, coercion, or discrimination against applicants or employees because they have engaged in, or may engage in, (1) filing a complaint; (2) assisting or participating in an investigation, compliance review, hearing, or any other activity related to the administration of EO 11246, Section 503, Section 4212, or any other Federal, state or local law requiring equal opportunity; (3) opposing any act or practice made unlawful by EO 11246, Section 503, Section 4212 or any other Federal, state or local law requiring equal opportunity; or (4) exercising any other right protected by such laws or their implementing regulations.

DEFINITIONS

Honeywell or *Company*. For purposes of this Policy, Honeywell or Company shall mean Honeywell International Inc., its subsidiaries and affiliates, and their respective predecessors and successors.

Law. For purposes of this Policy, Law means all applicable federal, state and local laws and regulations.

RESPONSIBILITY FOR THE POLICY

This Policy is administered by Honeywell Human Resources, in consultation with the Honeywell Law Department.

Honeywell's Chief Executive Officer shall fully support the Company's affirmative action program and commit to the implementation of the Company's EEO and Affirmative Action policies.

The Company's Director, Staffing Excellence, shall (i) be responsible for the maintenance of the Company's EEO programs, and (ii) be responsible for (but is not restricted to) establishing and implementing reporting procedures and related systems for monitoring and auditing the Company's EEO practices.

RELATED POLICIES, INFORMATION AND RESOURCES

Workplace Harassment (Policy 2025)
Reduction-in-Force (Policy 2031)
Employees and Applicants with Disabilities (Policy 2079)

The following laws, all as amended, along with any implementing regulations:

- Title VII of the Civil Rights Act of 1964
- The Equal Pay Act of 1963
- The Age Discrimination in Employment Act of 1967
- The Americans with Disabilities Act of 1990
- The Job for Veterans Act (PL 107-288)
- Civil Rights Act of 1991
- Section 503 of the Rehabilitation Act of 1973
- Section 4212 of the Vietnam Era Veterans Readjustment Assistance Act of 1974
- Genetic Information Nondiscrimination Act of 2007
- Executive Order 11246

EXHIBITS

Exhibit A: Equal Employment and Affirmative Action Policy Statement for all U.S. and Expatriate Employees EEO AA Policy Statement 2017.pdf

Exhibit B: Equal Employment and Affirmative Action Policy Statement for Minnesota EEO AA Policy Statement MN 2017.pdf

REPORTING CONCERNS AND SEEKING GUIDANCE

Additional guidance can be sought by contacting a Human Resources representative.

REVISION HISTORY

This Policy was originally effective January 1, 2000. It was amended and restated effective January 1, 2001, May 15, 2009, September 19, 2011, and October 6, 2014.

MANAGEMENT'S RIGHTS

The Company, in its sole discretion, reserves the exclusive right to interpret, administer and apply this Policy, to make any exceptions to it, and to change this Policy at any time and for any reason.

This Policy is not intended to create contractual obligations. Employment with the Company in the U.S. (other than Puerto Rico) is at will, which means that either the Company or the employee may terminate the employment relationship at any time and for any reason, without notice. The Company reserves the right to modify, amend, or terminate this Policy at any time. This Policy supersedes any prior policies of Honeywell, whether written or oral, on the topics covered in this Policy.

This Policy is the property of Honeywell International Inc. and is published on the Company's intranet at http://policy.honeywell.com. It is the reader's responsibility to review the intranet publication of this policy to ensure the most current version is being referenced before taking action based on this printed copy, which may be outdated.

- **Non-Collusion Affidavit**

EXHIBIT A:

NON-COLLUSION AFFIDAVIT

TO: Board of Education of the Borough of Haddonfield
DATE: 08/05/24
FROM: Honeywell International Inc.
TELEPHONE: 856.437.1856
E-MAIL: caroline.jackson@honeywell.com
FACSIMILE: 908-292-1061

In signing this proposal, we certify that we have not, either directly or indirectly, entered into any agreement or otherwise colluded in any manner with any other person, or otherwise taken any action that would restrain or impede open and free competition and competitive bidding for this project; that no attempt has been made to induce any other person or firm to submit or not to submit a proposal; that this proposal has been independently arrived at without agreement or collusion with any other Proposer, competitor, potential competitor or other person; and that this proposal has not been knowingly disclosed prior to the opening of proposals to any other Proposer, competitor or person not affiliated with Proposer.

We further certify that no requirement or commitment, direct or indirect, was made to any person, or elected official and that no undisclosed benefit of any kind was promised to anyone connected with this project.

We further certify that no person or selling agent has been employed or retained to solicit or secure the contract that is the subject of this RFP upon an agreement or understanding for a commission, percentage, brokerage or contingent fee.

We certify that the foregoing statements are true and accurate under penalty of perjury.

The undersigned, by submitting this proposal, hereby agrees with all the terms, conditions, and specifications required by the New Jersey School District/Board of Education in this Request for Proposal, and declares that the attached proposal and pricing are in conformity therewith.

SIGNATURE: Caroline Jackson
DATE: 08/05/24
TYPE OR PRINT NAME: Caroline Jackson
TITLE: Sr Business Consultant
DATE: 08/05/24

NJ ESIP RFP Education Template: rev 7.1.22

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- **Disclosure Of Investment Activities In Iran**

EXHIBIT H

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY
DIVISION OF PURCHASE AND PROPERTY

33 WEST STATE STREET, P.O. BOX 230
TRENTON, NEW JERSEY 08625-0230

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN FORM

BID SOLICITATION #: BOE of the Borough of Haddonfield **VENDOR/BIDDER:** Honeywell International Inc.

PART 1
CERTIFICATION
VENDOR/BIDDER MUST COMPLETE PART 1 BY CHECKING ONE OF THE BOXES
FAILURE TO CHECK ONE OF THE BOXES WILL RENDER THE PROPOSAL NON-RESPONSIVE

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person nor entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of the Treasury's Chapter 25 list as a person or entity engaged in investment activities in Iran. The Chapter 25 list is found on the Division's website at http://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Vendors/Bidders must review this list prior to completing the below certification. **Failure to complete the certification will render a Vendor's/Bidder's proposal non-responsive.** If the Director of the Division of Purchase and Property finds a person or entity to be in violation of the law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

CHECK THE APPROPRIATE BOX

A. X I certify, pursuant to Public Law 2012, c. 25, that neither the Vendor/Bidder listed above nor any of its parents, subsidiaries, or affiliates is listed on the N.J. Department of the Treasury's list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25 List"). Disregard Part 2 and complete and sign the Certification below.

OR

B. I am unable to certify as above because the Vendor/Bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department's Chapter 25 list. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below. Failure to provide such information will result in the proposal being rendered as nonresponsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2
PLEASE PROVIDE ADDITIONAL INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

If you checked Box "B" above, provide a detailed, accurate and precise description of the activities of the Vendor/Bidder, or one of its parents, subsidiaries or affiliates, engaged in the investment activities in Iran by completing the boxes below.

ENTITY NAME: none
RELATIONSHIP TO VENDOR/BIDDER:
DESCRIPTION OF ACTIVITIES:
DURATION OF ENGAGEMENT:
ANTICIPATED CESSATION DATE:
VENDOR/BIDDER CONTACT NAME:
VENDOR/BIDDER CONTACT PHONE No.:
Attach Additional Sheets If Necessary.

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor/Bidder, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the State of New Jersey is relying on the information contained herein, and that the Vendor/Bidder is under a continuing obligation from the date of this certification through the completion of any contract(s) with the State to notify the State in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I will be subject to criminal prosecution under the law, and it will constitute a material breach of my agreement(s) with the State, permitting the State to declare any contract(s) resulting from this certification void and unenforceable.

Caroline Jackson 08/02/2024

Signature Date

Caroline Jackson, Sr. Business Consultant

Print Name and Title

DPP Rev. 6.19.17 Page 1 of 1

NJ ESIP RFP Education Template: rev 7.1.22

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- **Disclosure Of Investment Activities In Russia/Belarus**

CERTIFICATION OF NON-INVOLVEMENT IN PROHIBITED ACTIVITIES IN RUSSIA OR BELARUS

Pursuant to N.J.S.A. 52:32-60.1, et seq. (L. 2022, c. 3) any person or entity (hereinafter "Vendor[1]") that seeks to enter into or renew a contract with a State agency for the provision of goods or services, or the purchase of bonds or other obligations, must complete the certification below indicating whether or not the Vendor is identified on the Office of Foreign Assets Control (OFAC) Specially Designated Nationals and Blocked Persons list, available here: https://sanctionssearch.ofac.treas.gov/. If the Department of the Treasury finds that a Vendor has made a certification in violation of the law, it shall take any action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

I, the undersigned, certify that I have read the definition of "Vendor" below, and have reviewed the Office of Foreign Assets Control (OFAC) Specially Designated Nationals and Blocked Persons list, and having done so certify:

(Check the Appropriate Box)

(●) A. That the Vendor is not identified on the OFAC Specially Designated Nationals and Blocked Persons list on account of activity related to Russia and/or Belarus.

OR

( ) B. That I am unable to certify as to "A" above, because the Vendor is identified on the OFAC Specially Designated Nationals and Blocked Persons list on account of activity related to Russia and/or Belarus.

OR

( ) C. That I am unable to certify as to "A" above, because the Vendor is identified on the OFAC Specially Designated Nationals and Blocked Persons list. However, the Vendor is engaged in activity related to Russia and/or Belarus consistent with federal law, regulation, license or exemption. A detailed description of how the Vendor's activity related to Russia and/or Belarus is consistent with federal law is set forth below.

_____

_____

_____

_____

_____

_____

(Attach Additional Sheets If Necessary.)

Caroline Jackson Signature of Vendor's Authorized Representative	August 5, 2024 Date
Caroline Jackson Senior Business Consultant Print Name and Title of Vendor's Authorized Representative	22-2640650 Vendor's FEIN
Honeywell International Inc Vendor's Name	856.437.1856 Vendor's Phone Number
534 Fellowship Rd Vendor's Address (Street Address)	 Vendor's Fax Number
Mt. Laurel, NJ 08054 Vendor's Address (City/State/Zip Code)	caroline.jackson@honeywell.com Vendor's Email Address

[1] Vendor means: (1) A natural person, corporation, company, limited partnership, limited liability partnership, limited liability company, business association, sole proprietorship, joint venture, partnership, society, trust, or any other nongovernmental entity, organization, or group; (2) Any governmental entity or instrumentality of a government, including a multilateral development institution, as defined in Section 1701(c)(3) of the International Financial Institutions Act, 22 U.S.C. 262r(c)(3); or (3) Any parent, successor, subunit, direct or indirect subsidiary, or any entity under common ownership or control with, any entity described in paragraph (1) or (2).

NJ Rev. 1.22.2024

- **W9 / Certificate of Insurance / NJ DPMC Certification**

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.
Honeywell International Inc.

2 Business name/disregarded entity name, if different from above
Honeywell Building Solutions

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☑ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):
Exempt payee code (if any) 5
Exemption from FATCA reporting code (if any) D
(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.
855 S. Mint Street

Requester's name and address (optional)

6 City, state, and ZIP code
Charlotte, NC 28202

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number
[ ][ ][ ] – [ ][ ] – [ ][ ][ ][ ]

or

Employer identification number
2 2 – 2 6 4 0 6 5 0

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Mark L. Hall Date ▶ 1/10/2024

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

Cat. No. 10231X Form **W-9** (Rev. 10-2018)

CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY) 03/27/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

Holder Identifier :

PRODUCER	CONTACT NAME:
Aon Risk Services Northeast, Inc. New York NY Office One Liberty Plaza 165 Broadway, Suite 3201 New York NY 10006 USA	PHONE (A/C. No. Ext): (866) 283-7122 FAX (A/C. No.): (800) 363-0105 E-MAIL ADDRESS:

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
Honeywell International Inc. 855 S. Mint Street Charlotte NC 28202 USA	INSURER A: XL Insurance America Inc	24554
	INSURER B: XL Specialty Insurance Co	37885
	INSURER C: Greenwich Insurance Company	22322
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES **CERTIFICATE NUMBER:** 570104640771 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS. Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
C	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY PRO-JECT LOC OTHER:			RGC943763011	04/01/2024	04/01/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$5,000,000 $5,000,000 $50,000 $5,000,000 $5,000,000 Included
C	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY			RAC943764211	04/01/2024	04/01/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$1,000,000
C	UMBRELLA LIAB X OCCUR X EXCESS LIAB CLAIMS-MADE DED RETENTION			RAO943764511 EXCESS AUTO ONLY	04/01/2024	04/01/2025	EACH OCCURRENCE AGGREGATE	$4,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y / N N	N / A	RWD943540311	04/01/2024	04/01/2025	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE-EA EMPLOYEE E.L. DISEASE-POLICY LIMIT	$5,000,000 $5,000,000 $5,000,000
B	Excess Workers Compensation			RWE943540411 XS WC (AZ, OH, WA) SIR applies per policy terms & conditions	04/01/2024	04/01/2025	EL Each Accident EL Disease - Ea Emp	$5,000,000 $5,000,000

Certificate No : 570104640771

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Evidence of coverage . Blanket Additional Insured where required by written contract endorsement is included on the General Liability and Automobile Liability policies . Blanket contractual Liability is included on the General Liability and Auto policies per the policy coverage forms. A waiver of subrogation where required by written contract is included on applicable policies shown above. Honeywell will provide the General Liability ISO endorsement form numbers where required by written contract upon request.

CERTIFICATE HOLDER	CANCELLATION
Honeywell International Inc. 855 S. Mint Charlotte NC 28202 USA	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE *Aon Risk Services Northeast, Inc.*

AGENCY CUSTOMER ID: 570000054391
LOC #:

ACORD

ADDITIONAL REMARKS SCHEDULE

Page _ of _

AGENCY	NAMED INSURED
Aon Risk Services Northeast, Inc.	Honeywell International Inc.
POLICY NUMBER: See Certificate Number: 570104640771	
CARRIER: See Certificate Number: 570104640771 / NAIC CODE	EFFECTIVE DATE:

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: ACORD 25 **FORM TITLE:** Certificate of Liability Insurance

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER	
INSURER	
INSURER	
INSURER	

ADDITIONAL POLICIES If a policy below does not include limit information, refer to the corresponding policy on the ACORD certificate form for policy limits.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	LIMITS	
	OTHER							
B				RWE943540511 XS WC (NM) SIR applies per policy terms & conditions	04/01/2024	04/01/2025		

ACORD 101 (2008/01)

HONEYWELL INTERNATIONAL INC
115 TABOR ROAD
MORRIS PLAINS, NJ 07950

State of New Jersey

DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
33 WEST STATE STREET - P.O. BOX 034
TRENTON, NEW JERSEY 08625-0034

NOTICE OF CLASSIFICATION

In accordance with N.J.S.A. 18A:18A-27 et seq (Department of Education) and N.J.S.A. 52:35-1 (Department of the Treasury) and any rules and regulations issued pursuant hereto, you are hereby notified of your classification to do State work for the Department (s) as previously noted.

Aggregate Amount	Trade(s) & License(s)	Effective Date	Expiration Date
Unlimited	C043 -CONTROL SYSTEMS	04/01/2023	03/31/2025
	C098 -ENERGY MANAGEMENT SYSTEMS	04/01/2023	
	C036 -ENERGY SERVICES/ESCO	04/01/2023	
	C049 -FIRE ALARM/SIGNAL SYSTEMS	04/01/2023	
	license #: 34BF00009500		
	C032 -HVACR	04/01/2023	
	license #: 19HC00404900		
	C050 -SECURITY/INTRUSION ALARMS	04/01/2023	

- Licenses associated with certain trades are on file with the Division of Property Management & Construction (DPMC).
- Current license information must be verified prior to bid award.
- A copy of the DPMC 701 Form (Total Amount of Uncompleted Projects) may be accessed from the DPMC website at https://www.nj.gov/treasury/dpmc/Assets/Files/DPMC701.pdf.

ANY ATTEMPT BY A CONTRACTOR TO ALTER OR MISREPRESENT ANY INFORMATION CONTAINED IN THIS FORM MAY RESULT IN PROSECUTION AND/OR DEBARMENT, SUSPENSION OR DISQUALIFICATION. INFORMATION ON AGGREGATE AMOUNTS CAN BE VERIFIED ON THE DPMC WEB SITE.

NJ Co-Op Purchasing Required Information

Since the Haddonfield School District Board of Education is a member in good standing with the Omnia Cooperative, use of Omnia Cooperative in the selection of Honeywell under contract # R221502 is allowed under NJ Public Contracts law as outlined in LFN 2012-10 and consists of the following elements and authorized by DLGS/DCA as well as the following elements:

- "an organization (profit or not-for-profit) that coordinates and aggregates contracts from different state and local governments and promotes their use."
- "in the context of the LPCL and PSCL, the provisions of this notice apply when the aggregate value of the goods or services (see N.J.A.C. 5:34-8.2) exceeds the contracting unit's bid threshold."
- the national cooperative contract must have been advertised as a national or regional cooperative and awarded pursuant to a competitive bidding process that complies with the laws applicable.
- The LFN requires if a national cooperative contract is chosen, the calculation of cost savings from using this approach must be documented: The Law requires a contracting unit can use national cooperatives only when the contracting unit determines " the use of the cooperative purchasing agreement shall result in cost savings after all factors, including charges for service, material, and delivery, have been considered."
- The LFN states if using an online ordering system, local officials must put "appropriate internal controls" in place to ensure purchases are documented and that an audit trail exists

This document will certify Honeywell and the use of this cooperative purchasing agreement will remain compliant with the services of the COOP for the Haddonfield School District; that ALL public works in conjunction with the School District and in accordance with NJ Public Contract Law (NJSA 18A:18A-1 et seq.) will be procured according to State requirements. To clarify further, this applies to a public works projects including and not limited to installing electrical, lighting, plumbing, HVAC, BMS systems etc. Additionally, that no on-line ordering system will be used as part of this process.

It is estimated the cost savings to the District by using the Cooperative Agreement will save approximately $6,600 in legal fees, 100-man hours as well as significant lost energy savings per month for every month waiting to administer the RFP process on their own. Because Omnia has undertaken the competitive process on the district's behalf, the savings can be achieved as outlined in this plan approximately 10 months sooner than via a local competitive contracting approach.

NJ Co-Op Resolution to select ESCO

HADDONFIELD BOARD OF EDUCATION
95 Grove Street • Haddonfield, NJ 08033-1892
(856) 429-7510
www.haddonfieldschools.org

Michael A. Catalano
Board Secretary

November 1, 2023

4) APPROVAL OF FOLLOWING BUSINESS & FINANCE RECOMMENDATIONS

g) Approval of Energy Savings Company (ESCO) for Implementation of an Energy Savings Improvement Project (ESIP)

WHEREAS; N.J.S.A. P.L. 2011, c.139 (LFN 2012-10) enables local contracting units to utilize national cooperative contracts as a method of procurement, the Haddonfield Board of Education (BOE) being a member of the Omnia Partners Public Sector National Cooperative (Omnia) and;

WHEREAS; Energy Savings Performance Contract Services are available via contract No. 171201 within the Omnia portfolio;

WHEREAS; Omnia utilized a competitive bidding process in the selection of contractors capable of implementing an Energy Savings Performance Contract and,

WHEREAS; Honeywell International under contract #171201 has competed and selected as a provider of Energy Savings Performance Contracts under Omnia and:

WHEREAS; Honeywell International is also designated under the Department of Management and Construction (DPMC) in the State of New Jersey under a CO36 classification as a qualified Energy Services Company (ESCO) and;

WHEREAS; Honey International has implemented multiple Energy Savings Performance Contracts within New Jersey as titled the Energy Savings Improvement Program (ESIP)

WHEREAS; the BOE has selected Honeywell International, 534 Fellowship Rd. Mt. Laurel Township, NJ 08054 the qualified Energy Service Company (ESCO) to detail, design and implement an Energy Savings Plan and ESIP project for the BOE in accordance with P.L. 2012, c.55 (P.L.2009, c.4); and

WHEREAS, Honeywell will provide an Energy Savings Plan, including engineering, construction, project management as part of their proposal and that the total costs of services will be a predetermined amount and paid for out of the energy savings as calculated in accordance with P.L.2012, c.55,

WHEREAS, there is no cost for the Energy Savings Plan and the BOE will have an option to continue the process to full implementation of the ESIP project once the ESP has been reviewed and approved by an independent 3rd party in accordance with P.L.2012, c.55, and adopted by the BOE.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Education authorizes the School Business Administrator/Board Secretary to execute a Project Development Agreement with Honeywell upon review and approval from the Board Attorney.

The is to certify the above is a true copy of motion adopted by the Board of Education of the Borough of Haddonfield, in the County of Camden, New Jersey, at a Regular Meeting, October 19, 2023, held in the Haddonfield Memorial High School library.

The Motion: Mr. Nuckols Second: Ms. Hoag

	Yes	No	ABS		Yes	No	ABS
President Grookett	Yes			Ms. Hoag	Yes		
Vice President Hochgertel			Absent	Ms. Hollingworth	Yes		
Ms. Benecchi			Absent	Mr. Nuckols	Yes		
Dr. Brown	Yes			Ms. Paoli			Absent
Mr. Esemplare	Yes						

I, Michael A. Catalano, Board Secretary of Haddonfield Board of Education, in the County of Camden, State of New Jersey do hereby certify that the foregoing is a true and exact copy of a resolution adopted by the governing body of the Haddonfield Board of Education, County of Camden, State of New Jersey at a regular business meeting of said governing body held October 19, 2023.

Michael A. Catalano
Board Secretary

For more information

www.honeywell.com/us/en/industries/buildings-cities

Honeywell Energy Services Group

Caroline Jackson
Senior Business Consultant
Honeywell Energy Services Group
534 Fellowship Rd
Mt. Laurel, NJ 08054
Office: 856.437.1856
Mobile: 610.247.8126
caroline.jackson@honeywell.com

THE FUTURE IS WHAT WE MAKE IT

Honeywell