ENERGY SAVINGS PLAN (ESP)

ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)

Manasquan Public School District
February 10, 2023

PREPARED FOR

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Honeywell

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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 selecting Honeywell to develop an Energy Savings Plan for the Manasquan Public School District (the District).

During the development of the Energy Savings Plan, Honeywell has completed a thorough investment grade energy audit of the District's buildings and grounds. Based on the audit findings, this plan has identified a project that addresses the District's facility concerns and goals in a financially viable manner.

This Energy Savings Plan includes facility improvements 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.

The Energy Savings Plan is a key component 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
- Identification of eligibility for, as well as 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 ECMs and the projected energy savings
- Maintenance requirements necessary to ensure continued energy savings, and describe how they will be provided

The purpose of this document is to provide all the information required for the 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 would 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 to facilitate informed decisions. 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 District's 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 District's utility consumption to that of other districts in the same region on a per-square-foot basis.

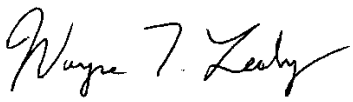
C. **Energy Conservation Measures** – This section includes a detailed description of the ECMs selected by your District. It is specific to your facilities in scope, savings methodology, and environmental impact. It is intended to provide a basis of design for each measure in narrative form. It is not intended to be a detailed specification for construction. ALL potential ECMs for the District are identified for the purposes of potential inclusion in the program. Final selected ECMs are to be determined solely by the District and the financial goals outlined within the ESIP program to be self-funding within existing budget guidelines.

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 15-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.

Overall, it is evident the District is well-positioned to implement a program that will upgrade its facilities while funding itself within the requirements of the law and with zero impact on the taxpayer base. We appreciate the opportunity to provide the District with this guideline to improve the comfort and efficiency of its facilities through the successful implementation of this Energy Savings Plan should the District decide to move forward with a project.

Sincerely,



Wayne T Leahy

Senior Business Consultant

SECTION B

PRELIMINARY UTILITY ANALYSIS (PUA)

Section B — Preliminary Utility Analysis (PUA)

Honeywell

Preliminary Utility Analysis

Manasquan Public SD
Manasquan, 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

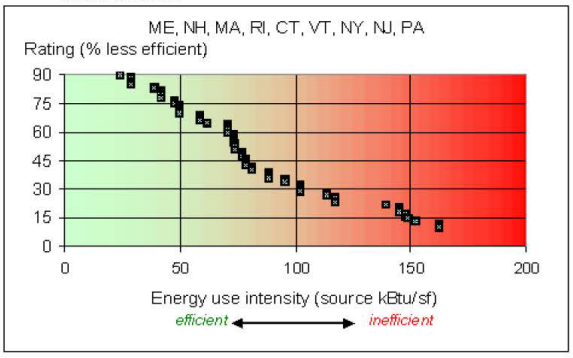
The calculation of EUI (Energy Use Intensity) is shown below. EUI, expressed in kBtu/sf, is normalized for floor area, the most dominant influence on energy use in most buildings. Its use usually provides a good approximation of how your building's energy performance compares to others. Site EUI indicates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

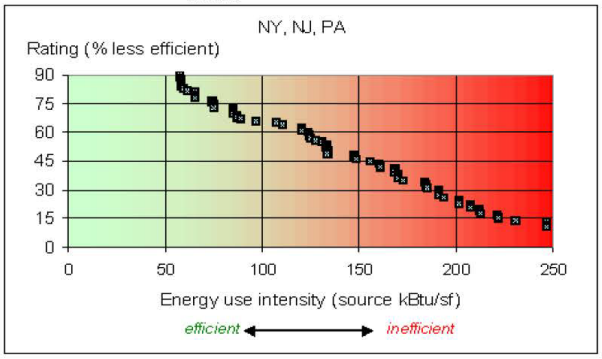
Source EUI Rating for your Building	Energy use and cost reduction potential (%)	Walk-thru energy assessment recommended?
above 60%	below 25%	No
40 to 60%	20 to 35%	Maybe
20 to 40%	35 to 50%	Yes
Below 20%	above 50%	Definitely

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	Administrative Building	28,720	2,156	7,241	**43**	**71**	**75%**
2	Manasquan High School	1,054,120	50,897	212,220	**41**	**75**	**30%**
3	Manasquan Elementary School	1,198,840	40,460	238,204	**34**	**69**	**30%**
4	Alternative School	22,874	479	6,330	**20**	**45**	**75%**
5	Industrial Arts Building	34,960	5,467	10,863	**61**	**84**	**30%**
6	MHS Warehouse/Weightroom	5,773	1,617	4,640	**39**	**48**	**75%**
		2,345,287					

School Facilities



Offices



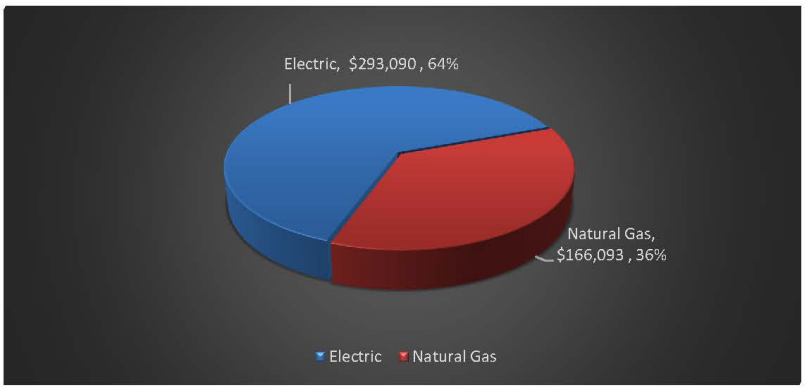
Historical Summary

Utility Analysis Period:
July 2021 - June 2022

	Electric	Natural Gas
Utility Costs*	$293,090	$166,093
Utility Usage (kWh, Therms)	2,345,287	101,076
$ Cost/Unit (kWh, Therms)	$0.12497	$1.643
Annual Electric Demand (kW)	12,525	

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

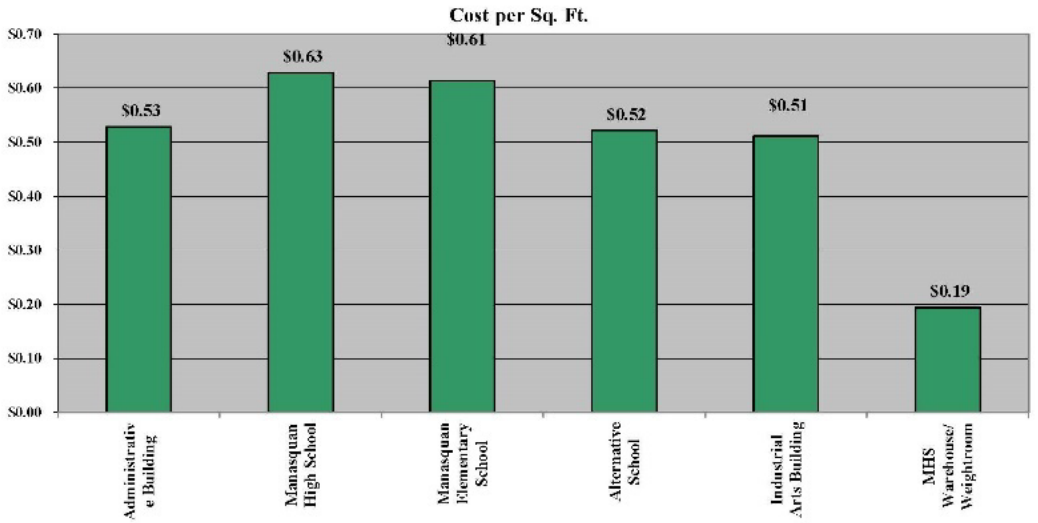
Actual Cost by Utility
July 2021 - June 2022

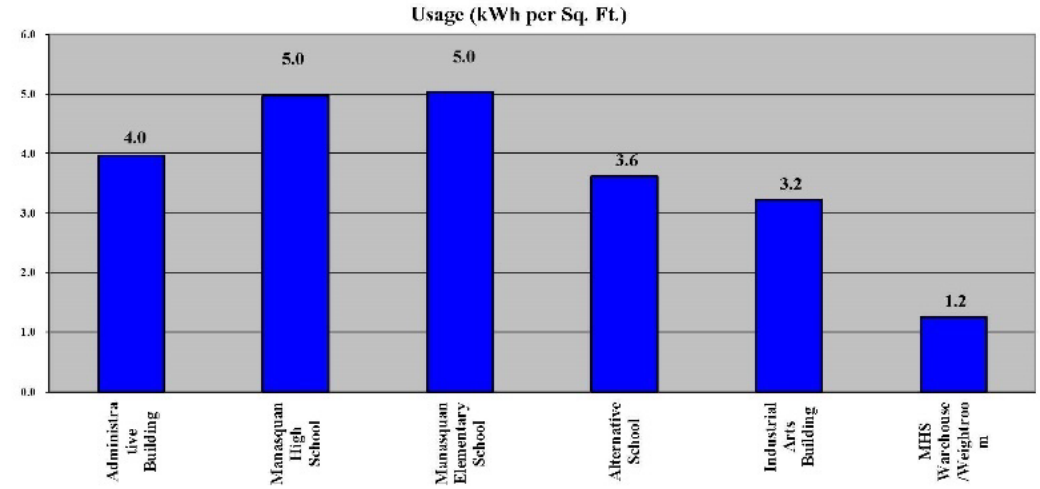


Total Cost
$459,183

Utility Analysis
Electric

Square Footage Analysis

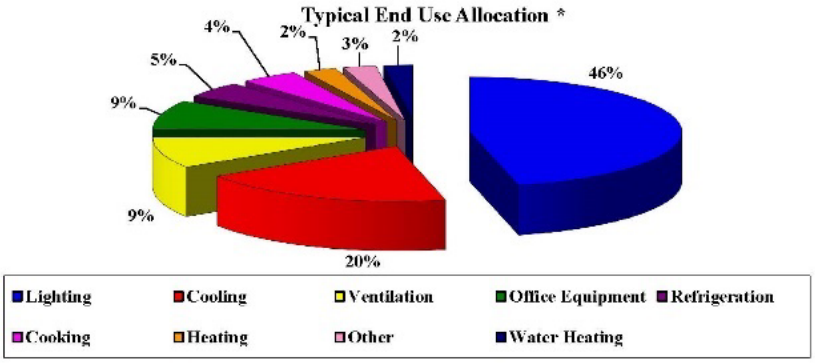




Note: Average kWh/SF for School buildings in this climate zone is 9.0

Electric

Sources of Electric Consumption

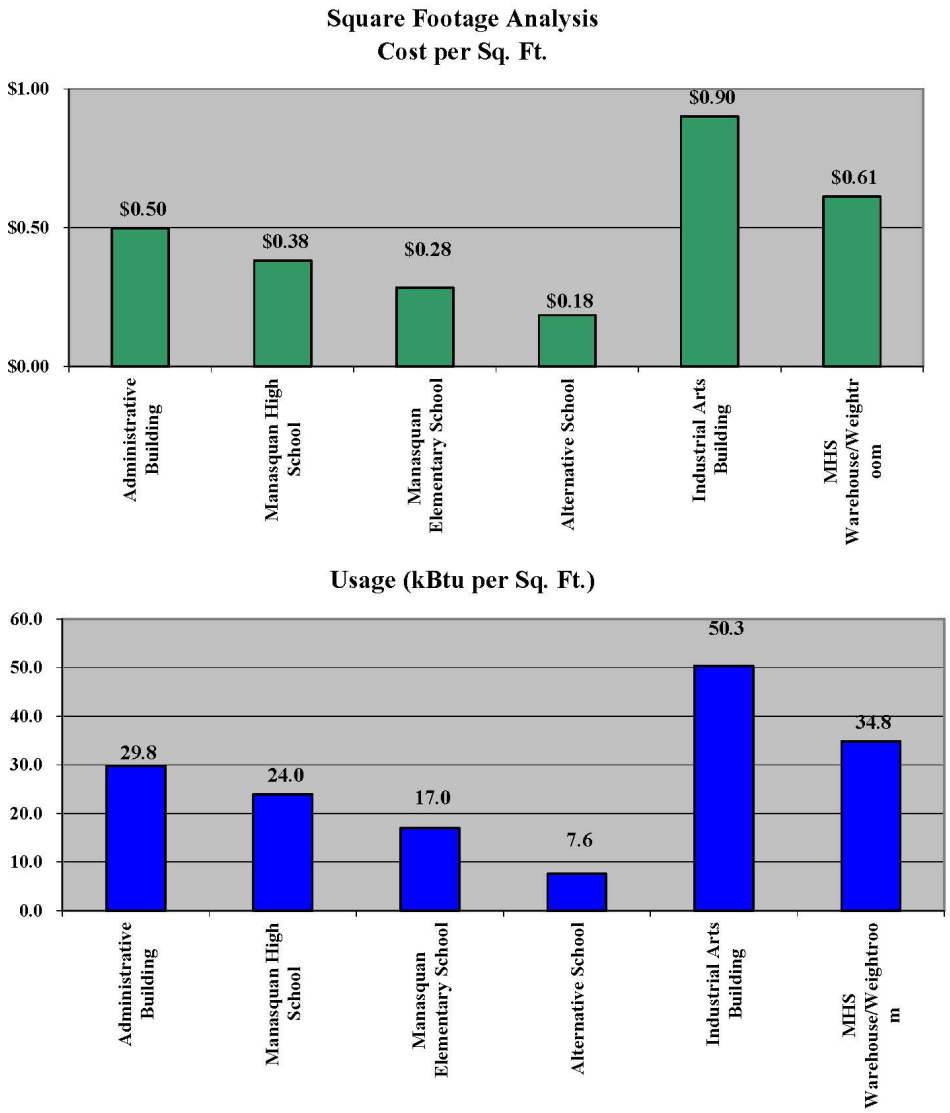


**This allocation is generic and is not a representation of the actual end use in your buildings included in this report.

Typical Allocation Applied to Your Electric Cost**

Lighting	$135,701
Cooling	$57,446
Ventilation	$26,964
Office Equipment	$25,206
Refrigeration	$13,775
Cooking	$12,896
Heating	$7,327
Other	$7,327
Water Heating	$6,448
Your Total Cost July 2021 - June 2022	**$293,090**

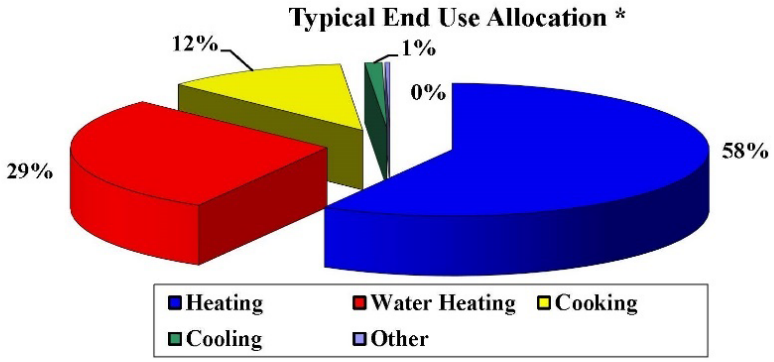
Utility Analysis
Natural Gas



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	$96,832
Water Heating	$48,001
Cooking	$18,935
Cooling	$1,827
Other	$498
Your Total Cost July 2021 - June 2022	**$166,093**

Annual Emissions & Environmental Impact

Manasquan Public SD

July 2021 - June 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	2,345,287	kWh
Annual Natural Gas usage	101,076	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)	1,659	MT
eCO2 (Gas)	534	MT
Total eCO2	2,193.060	MT

This is equivalent to one of the following:	
473	No. of passenger vehicles - annual greenhouse gas emissions
2865	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 (ECMS)

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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weightroom
1A LED Lighting Upgrades	●	●	●	●	●	●
1B Lighting Controls	●	●	●	●	●	●
1C De-Stratification Fans w/ UV Disinfection		●	●			
2A Boiler Replacements					●	
2B Add Cooling to Industrial Arts Building					●	
2C Replace Unit Ventilators in Industrial Arts Building					●	
2D Rooftop Unit Replacement			●			
2E Kitchen Hood Controllers		●	●			
2F Premium Efficiency Motors and VFDs			●			
2G Split System Replacements	●		●			
2H Walk-In Compressor Controls		●	●			
2I Burner Replacements and Controls		●				
2J Domestic Water Heater Replacement		●				
3A Building Management System Upgrades	●	●	●	●	●	●

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weightroom
3B CO2 Controls			●		●	
4A SSB-VEER Assessment and Verification			●		●	
5A Solar PPA		●	●			
6A Design Allowance	●	●	●	●	●	●
7A Permanent Load Reduction	●	●	●	●	●	●
8A Building Envelope Improvements	●	●	●	●	●	●
9A Cogeneration CHP		●				
10A Sustainable Transportation - EV Chargers		●	●			

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, 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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
1A LED Lighting Upgrades	●	●	●	●	●	●

EXISTING CONDITIONS

Indoor lighting predominantly consists of fluorescent T-8 lamps, with a smaller quantity of other fixtures such as compact fluorescent lamps (CFLs), incandescent bulbs, and high-intensity discharge (HID) lighting.

SCOPE OF WORK

The proposed lighting system is based on the recent investment grade lighting system audit where existing lighting systems were analyzed and inventoried. Honeywell proposes to retrofit all existing fluorescent fixtures with high efficiency Light Emitting Diode (LED) lamps.

The district will receive many benefits from the lighting system upgrade.

Existing Lighting at Manasquan ES

Existing Lighting at Manasquan HS

LED OUTDOOR LIGHTING UPGRADES

EXISTING CONDITIONS

The District has various types of High Intensity Discharge (HID) light fixtures and older LED fixtures, which are not as efficient as modern LED types. Parking lot and building exterior lights consist of pole mounted shoe-box type and wall pack HID fixtures.

SCOPE OF WORK

The exterior wall-packs and pole-mounted shoebox fixtures are currently high wattage HID lamps. These will be replaced with lower wattage LED fixtures. The LED technologies offer significant advantages such as extended lamp life, minimal lumen depreciation, “instant on,” and very high energy conversion efficiency. These fixtures will provide substantial maintenance savings via the new 100,000-hour LED lamp life versus the 20,000 hours of the existing metal halide lamps.

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 Lighting Controls

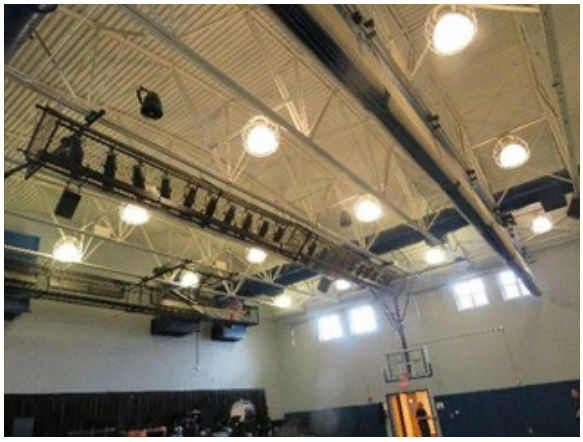
The key benefits of this ECM include:

- **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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
1B Lighting Controls	●	●	●	●	●	

EXISTING CONDITIONS

Educational institutions, such as K-12 districts, are focused on providing classrooms and campuses for their students and teachers that are safe, healthy, and energy-efficient, by providing the best environment for learning while also chartered with reducing the costs of building operations.



Lighting Control Space at Manasquan ES

Lighting Control Space at Manasquan HS

Example of interior lighting sensor

Example of Exterior lighting sensor

Honeywell proposes the installation of occupancy-based lighting controls for interior spaces and photo-controls for exterior lighting fixtures where none are currently installed. These controls will automatically control lighting systems based on either occupancy or outdoor light levels.

SCOPE OF WORK

Lighting controls lower cost by adjusting light levels by occupancy and turning lights off when not needed.

CHANGES IN INFRASTRUCTURE

New lighting control devices 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. A slight increase in heating energy is resultant from the reduced heat output from lighting that is turned off.
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:

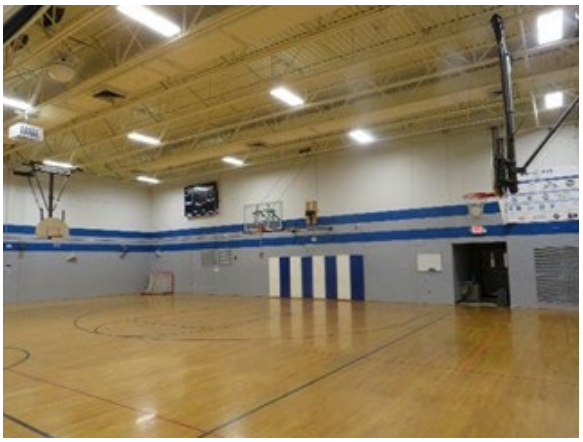
- **Improved efficiency and energy savings** through more equal distribution of conditioned air space
- **Equipment longevity** due to lower utilization of equipment to condition air
- **Increased comfort** of students and teachers

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
1C De-Stratification Fans w/ 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.

Manasquan HS - Multi-purpose Room



Manasquan ES - 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 0–3°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 an average of less than 24 hours.

Airius PureAir Series is an air purification and airflow circulation fan system that incorporates the latest in Photohydroionization (PHI) 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, naturally occurring cleaning agents, 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.

Proposed De-Stratification Fans

Building	Location	Airius Model	Qty Pure Air	Qty Air Pear
Manasquan High School	Gym	(4)A-25-SP-STD-120-W (4)A-25-SP-STD-120-W-PHI	4	4
Manasquan High School	Cafeteria	(2) A-25-SP-STD-120-W (2)A-25-SP-STD-120-W-PHI	2	2
Manasquan Elementary School	MPR	(3)A-25-SP-STD-120-W (3)A-25-SP-STD-120-W-PHI	3	3
Manasquan Elementary School	Gym	(3) A-25-SP-STD-120-W (3)A-25-SP-STD-120-W-PHI	3	3
TOTAL			**12**	**12**

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 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 fewer operational issues.

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2A Boiler Replacements					●	

EXISTING CONDITIONS

The boiler at the Industrial Arts Building is past the end of its useful life and is less efficient compared to new boilers. The existing boiler can be replaced with high efficiency condensing boilers.

Industrial Arts Building - Boiler

Industrial Arts Building - Boiler

EXISTING BOILERS TO BE REPLACED

Existing Boilers

Building	Type	Manufacturer	Model	Output (MBH)	Fuel	Qty
Industrial Arts Building	Hot Water	HB Smith	M86-86	874	NG	1

PROPOSED SOLUTION

It is recommended that the boiler 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.

Proposed Boilers

Building	Type	Manufacturer	Model	Output (MBH)	Fuel	Qty
Industrial Arts Building	Hot Water	AERCO	AM-399	399	NG	1

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.

ECM 2B Add Cooling to Industrial Arts Building - Capital Improvement

The key benefits of this ECM include:

- **Increased comfort of students and teachers** in warmer days with addition of cooling

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2B Add Cooling to Industrial Arts Building					●	

EXISTING CONDITIONS

Honeywell has identified several areas in schools where addition of cooling is desirable. Cooling is now provided by window units at Industrial Arts Building. Although adding cooling may increase the energy use of the building, the addition of cooling makes a better learning environment for students by increasing comfort during warmer school days.

Industrial Arts Building – Art Room

Industrial Arts Building – Wood Shop

PROPOSED SOLUTION

New Cooing Units

Building	Manufacturer	Area Served	Model	Qty	Tons
Industrial Arts Building	Trane	Wood Shop A	4TTA4048	1	4
Industrial Arts Building	Trane	Wood Shop B	4TTA4048	1	4
Industrial Arts Building	Trane	Art Room A	4TTA4048	1	4
Industrial Arts Building	Trane	Art Room B	4TTA4048	1	4
Industrial Arts Building	Trane	Office	4TTA4023	1	2

Honeywell proposes installing new cooling units at the above location to add cooling to wood shop and art room at Industrial Arts Building.

ENERGY SAVINGS METHODOLOGY AND RESULTS

The energy savings for this ECM is realized by the reduction in run time of the cooling compressors and increased quality of the learning environment. In spaces not previously cooled, there may be a negative impact on energy savings.

CHANGES IN INFRASTRUCTURE

Addition of roof mounted equipment requiring roof penetrations as required.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

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

ENVIRONMENTAL ISSUES

Resource Use	Energy savings will result from the reduced electrical consumption of the compressor versus older technology.
Waste Production	Any removed parts will be disposed of properly.
Environmental Regulations	No environmental impact is expected.

ECM 2C Replace Unit Ventilators in Industrial Arts Building

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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2J Replace Unit Ventilators in Industrial Arts Building					●	

EXISTING CONDITIONS

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

Industrial Arts Building – Unit Ventilator

Industrial Arts Building – Unit Ventilator

EXISTING UNIT VENTILATORS TO BE REPLACED

Existing Unit Ventilators

Building	Type	Location	Add Cooling	Make	Model	Qty
Industrial Arts Building	Replace	Wood Shop A	Split Unit	Trane	HUV*1500	1
Industrial Arts Building	Replace	Wood Shop B	Split Unit	Trane	HUV*1500	1
Industrial Arts Building	Replace	Art Room	Split Unit	Trane	HUV*1500	1
Industrial Arts Building	Replace	Art Room	Split Unit	Trane	HUV*1500	1
Industrial Arts Building	Replace	Office	Split Unit	Trane	HUV*750	1

PROPOSED SOLUTION

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

SCOPE OF WORK

1. The following outlines the unit ventilator replacements
2. Disconnect electrical and steam from existing units
3. Install new univents and reconnect, steam, and electric
4. 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 2D Roof Top 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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2D Rooftop Unit Replacement			●			

EXISTING CONDITIONS

Some Rooftop Units (RTUs) serving the locations photographed below 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 RTUs in operation.

Manasquan ES - RTU

Manasquan ES - RTU

EXISTING ROOFTOP UNITS TO BE REPLACED

Existing Rooftop Units

Building	Location Served	Manufacturer	Model	Tons	Qty
Manasquan Elementary School	Section A2 Classrooms & Corridors	Trane	YCH480AEHU2B7 LE10B0D	40.0	1
Manasquan Elementary School	Section D1 Classroom - POD B1-6	Trane	YCD420AEHU2B7 GE10B0D	35.0	1
Manasquan Elementary School	202, 203, 204, 205	Trane	YCD420AEHU2B7 GE10BD	35.0	1
Manasquan Elementary School	Multipurpose Rm	Trane	YCD420AEHU2B7 GE10B0D	35.0	1

Building	Location Served	Manufacturer	Model	Tons	Qty
Manasquan Elementary School	Gym	Trane	YCH360AEHU2B6 DE10B0D	30.0	1
Manasquan Elementary School	Gym	Trane	YCH360AEHU2B6 DE10B0D	30.0	1
Manasquan Elementary School	Gym Storage 300,301,302	Trane	YCD330A4HU2B5 BE10B0D	27.5	1
Manasquan Elementary School	303, 304, 305, 306, 307, 308	Trane	YCD241C4HCCA	20.1	1
Manasquan Elementary School	Section A1 Classrooms & Corridors	Trane	YCH211C3HBCA	17.6	1
Manasquan Elementary School	Music 14	Trane	YCD181C3HCCA	15.0	1
Manasquan Elementary School	Main Office & Nurse	Trane	YCD151C3HRBB	12.6	1
Manasquan Elementary School	Kitchen Cafetorium	Trane	-	7.5	1

PROPOSED SOLUTION

Honeywell proposes replacing the existing rooftop units in the above table. The new units will be installed in the same location as the existing units. 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.

Proposed Rooftop Units

Building	Location Served	Manufacturer	Model	Tons	Qty
Manasquan Elementary School	Section A2 Classrooms & Corridors	Trane	YCH480	40.0	1
Manasquan Elementary School	Section D1 Classroom - POD B1-6	Trane	YCD420	35.0	1
Manasquan Elementary School	202, 203, 204, 205	Trane	YCD420	35.0	1
Manasquan Elementary School	Multipurpose Rm	Trane	YCD420	35.0	1
Manasquan Elementary School	Gym	Trane	YCH360	30.0	1
Manasquan Elementary School	Gym	Trane	YCH360	30.0	1
Manasquan Elementary School	Gym Storage 300,301,302	Trane	YCD330	27.5	1
Manasquan Elementary School	303, 304, 305, 306, 307, 308	Trane	YHD240	20.0	1
Manasquan Elementary School	Section A1 Classrooms & Corridors	Trane	YHH210	17.5	1
Manasquan Elementary School	Music 14	Trane	YHD180	15.0	1
Manasquan Elementary School	Main Office & Nurse	Trane	YHD150	12.5	1

Building	Location Served	Manufacturer	Model	Tons	Qty
Manasquan Elementary School	Kitchen Cafetorium	Trane	YHC092	7.5	1

SCOPE OF WORK

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

1. Disconnect existing RTU 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 rooftop 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 2E Kitchen Hood Efficiency Improvements

The key benefits of this ECM include:

- **Reduced energy usage** from improved equipment control and reduced exhaust of conditioned air.
- **Lower operational costs** through less frequent maintenance and operational issues.

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2E Kitchen Hood Controllers		●	●			

EXISTING CONDITIONS

Honeywell observed that the kitchens utilize a constant volume kitchen exhaust hood system. This system operates at full load, even when there is no activity in the kitchen. It also requires operating the exhaust fan at full load. This wastes both fan energy and heating energy. When the hood is not utilized, an opportunity exists to reduce airflow and conserve energy.

Manasquan ES - RTU

Manasquan ES - RTU

PROPOSED SOLUTION

Honeywell recommends installing a microprocessor-based controls system whose sensors automatically regulate fan speed based on cooking load, time of day and hood temperature while minimizing energy usage. The system includes a temperature sensor installed in the hood exhaust collar, IP sensors on the ends of the hood that detect the presence of smoke or cooking effluent and VFDs that control the speed of the fans. This will result in energy and cost savings, noise reduction, longer equipment life, and reduction in cleaning costs.

Existing Kitchen Hoods to Receive Controls

Building	Kitchen Hood (sq. ft.)
Manasquan High School	60
Manasquan Elementary School	150
Total	**210**

SCOPE OF WORK

1. Install a temperature sensor in the hood to monitor temperature of the exhaust gas.
2. Install a set of two photo sensors on the sides to monitor smoke density across the hood.
3. Install a control panel with a small point controller and a set of relays in the kitchen close to the hood.
4. Provide electric wiring from the new panel to the sensors, exhaust fan motor as well as to the closest electric panel for power supply.
5. Provide connection to the BMS system for remote monitoring, control, and alarming. This system could also be stand-alone to save on cost.
6. Commission control components and sequences and calibrate control loops.

Sequence of operation will enable the exhaust fans when either temperature or smoke density in the range hoods is above a pre-set value. Time delays between start and stop will be programmed to prevent motor short cycling. Schedule programming could be implemented as well.

ENERGY SAVINGS METHODOLOGY AND RESULTS

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

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

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

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

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

ENVIRONMENTAL ISSUES

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

ECM 2F Premium Efficiency Motors 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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2F 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.

Manasquan Elementary School – Motor

Manasquan Elementary School – Motor

EXISTING MOTORS TO BE REPLACED

Existing Motors

Building	Equipment Description	Qty.	Motor HP	Existing Efficiency	Replace Motor	Add VFD
Manasquan Elementary School	HW Pump	4	7.5	88.5%	Y	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 byproducts. Old motors shall be disposed of in accordance with all federal, state, and local codes.
Environmental Regulations	No environmental impact is expected.

ECM 2G Split System Replacements

The key benefits of this ECM include:

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

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2G Split System Replacements	●		●			

EXISTING CONDITIONS

Honeywell identified some condensing units as being inefficient and having exceeded their useful service life. 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 units in operation.

Administrative Building – Split System

Manasquan Elementary School – Split System

EXISTING CONDENSING UNITS TO BE REPLACED

Existing Condensing Units

Building	Area Served	Manufacturer	Model	Tons	Qty
Manasquan Elementary School	Library	Trane	RAUCC30EBY13ABD	30.0	1
Manasquan Elementary School	POD A	Trane	RAUCC25LBY13ABD	25.0	1
Manasquan Elementary School	Cafeteria	Trane	TTA180B300FA	15.0	1
Administrative Building	Storage	BDP	563AN048-A	4.0	1

PROPOSED SOLUTION

Honeywell proposes replacing the existing condensing units in the table above. 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.

Proposed Condensing Units

Building	Area Served	Manufacturer	Model	Tons	Qty
Manasquan Elementary School	Library	Trane	RAUJC30	30.0	1
Manasquan Elementary School	POD A	Trane	RAUJC25	25.0	1
Manasquan Elementary School	Cafeteria	Trane	TTA18043D	15.0	1
Administrative Building	Storage	Trane	4TTA3048	4.0	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 2H Walk-In Compressor Controls

The key benefits of this ECM include:

- **Energy savings** from reducing equipment runtime.
- **Equipment longevity** due to more efficient and less wasteful equipment utilization.
- **Operational savings** from less frequent need to repair or replace equipment thanks to less frequent equipment use.

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2H Walk-In Compressor Controls		●	●			

EXISTING CONDITIONS

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

Manasquan HS – Walk-In Ref./Frz.

Manasquan ES – Walk-In Ref./Frz.

EXISTING WALK-IN REFRIGERATOR/FREEZERS TO RECEIVE CONTROLS

Existing Walk-In Refrigerator/Freezers

Building	Location	Walk-In Refrigerators	Walk-In Freezers	Type
Manasquan Elementary School	Kitchen	1	1	Intellidyne
Manasquan High School	Kitchen	1	1	Intellidyne

PROPOSED SOLUTION

Honeywell will install a controller manufactured by Intellidyne at the above-mentioned buildings to reduce the compressor cycles of the kitchen walk-in coolers and freezers. The installation of this ECM will have

no negative impact on system operation or the freezing of food products. By reducing the cycling, the sensor will improve operating efficiency and reduce electric consumption by 10–20%.

This control enhancement will save energy through the reduced compressor cycling in the kitchen walk-in coolers and freezers and will extend the operating life of the compressor. Consequently, the compressor will not have to be replaced as often.

Intellidyne Sensor Features

- Automatic restart on power failure
- Surge protection incorporated into circuitry
- Fully compatible with all energy management systems
- UL listed
- Maintenance free

Intellidyne Sensor Benefits

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

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

ENERGY SAVINGS METHODOLOGY AND RESULTS

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

CHANGES IN INFRASTRUCTURE None.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

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

ENVIRONMENTAL ISSUES

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

ECM 2I Burner Replacements and 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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2I Burner Replacements and Controls		●				

EXISTING CONDITIONS

During our preliminary walkthroughs and conversations with District personnel, Honeywell has identified the boiler burners at Manasquan High School as the best candidates for burner replacements and controls.

Manasquan High School – Burners

Manasquan High School – Burners

EXISTING BURNERS TO BE REPLACED

Existing Burners

Building	Make	Model	MBH	Qty
Manasquan High School	Industrial Combustion	-	3,135	2
Manasquan High School	Industrial Combustion	LNVG-40	1,413	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 and 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

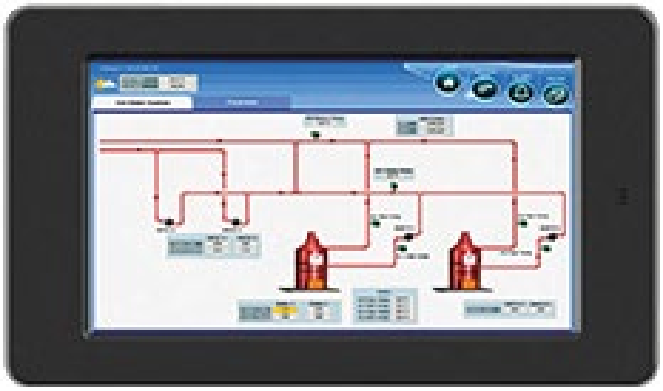
- Reduced fuel use
- Increased burner efficiency
- Greenhouse gas emissions reduction

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 2J Domestic 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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
2J Domestic Water Heater Replacement		●				

EXISTING CONDITIONS

The existing Domestic Hot Water (DHW) heaters and storage tanks at Manasquan High School are in poor condition and are not high-efficiency units.

Manasquan High School – Water Heaters

Manasquan High School – Storage Tanks

EXISTING WATER HEATERS TO BE REPLACED

Existing Water Heaters

Building	Manufacturer	Model	Output (MBH)	Storage	Fuel	Qty
Manasquan High School	AO Smith	HW520896	411	300	NG	2

PROPOSED SOLUTION

Honeywell proposes replacing the existing DHW heaters at the above location 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.

Proposed Water Heaters

Building	Manufacturer	Model	Output (MBH)	Storage	Fuel	Qty
Manasquan High School	AO Smith	BTH-400	400	300	NG	2

SCOPE OF WORK

The following outlines the boiler 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 Boiler Efficiency	= Existing Boiler Efficiency + Existing Heat Exchanger Efficiency
Proposed Boiler 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 3A Building Management System Upgrades

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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
3A Building Management System Upgrades	●	●	●	●	●	●

Building Management System Overview

Honeywell has performed a survey of the existing building management systems (BMS) throughout the Manasquan School District. The current installed Building Management Systems consists of a collection of first-generation LON controllers and newer advanced Honeywell Spyder Direct digital controllers on a Niagara 4 platform. The availability of obtaining the replacement and service of the proposed system through multiple commercial channels provides an additional benefit of an Open Source BMS. This feature unleashes the school district from only obtaining support from a single source provider to obtain support from readily available multiple contractor sources. As the existing legacy direct digital controllers, they can be incorporated into the enhanced system when needed.

EXISTING CONDITIONS

Existing Building Management Controls

Building	Existing Building Management System
Administrative Building	NA
Manasquan High School	Honeywell Eaglehawk NX
Manasquan Elementary School	Trane
Alternative School	NA
Industrial Arts Building	NA
MHS Warehouse	NA

PROPOSED SOLUTION

Honeywell proposes the following potential control programs with BMS upgrades.

District BMS Supervisor

- Provide BMS Supervisor for the Building Management System Centralized Scheduling, Alarming and Trending.
- Provide field support, technical assistance, and coordination with the Honeywell's Measurement & Verification team.

Administration Building

Provide the following controls:

- 3 Split AC Units - 3 NG Forced Hot Air Furnaces
  - 3 Smart Honeywell Wi-Fi Thermostat(s)
    - 1 Graphics, Trending, Alarming
    - 1 Start/Stop Enable relay
    - 1 Fan Status current switch
    - 1 Discharge Air Temperature sensor
    - 2 Heating/Cooling staging
    - 1 Space Temperature w/ Setpoint
- 2 Zones
  - 2 Smart Honeywell Wi-Fi Thermostat(s)
    - 1 Graphics, Trending, Alarming
    - 1 Start/Stop Enable relay
    - 1 Fan Status current switch
    - 1 Discharge Air Temperature sensor
    - 2 Heating/Cooling staging
    - 1 Space Temperature w/ Setpoint

Manasquan Alternative School

- Classroom 100
    - 1 Air Handling Unit - Existing Unit to remain
      - Components:
        - Split air conditioning (AC) system configuration.
        - Outdoor condensing unit
        - Built-in gas-fired furnace. located above the ceiling.
    - Provide the following controls:
      - 1 Smart Honeywell Wi-Fi Thermostat(s)
      - 1 Graphics, Trending, Alarming
      - 1 Start/Stop Enable relay
      - 1 Fan Status current switch

        - 1 Discharge Air Temperature sensor
        - 2 Heating/Cooling staging
        - 1 Space Temperature w/ Setpoint
- (2) Existing gas-fired unit heaters (Unit to remain)
    - Provide the following controls:
        - 1 Honeywell CIPer Network Controller w/NEMA 1 enclosure, control transformer
        - 1 Graphics, Trending, Alarming
        - 2 Start/Stop Enable relay
        - 2 Fan Status current switch
        - 2 Heating staging
        - 2 Space Temperature sensor(s)
- (2) Existing window Air Conditioning (AC) units to remain - Control of unit to remain local

Industrial Arts Building

- Heating System:
    - Existing Units to remain
    - Components:
        - 1 Hot Water Boiler
        - 1 Combustion Air Fan – Interlock to remain
        - 2 Hot Water pumps - MS
    - Provide the following controls
        - 1 Graphics, Trending, Alarming
        - 1 Honeywell CIPer DDC controller w/control transformer
        - 1 Outside Air Temperature sensor
        - 1 Boiler enable relay
        - 2 Hot Water Pump(s) controls
            - Start/Stop relay(s)
            - Status current switch(es)
        - 2 System Temperature sensor(s)
            - Hot Water Supply
            - Hot Water Return
- 5 Unit Ventilator – New Units – DDC Ready
    - Provide the following controls
        - 1 Graphics, Trending, Alarming
        - 1 Honeywell PUB DDC controller w/control transformer
        - 1 Supply Air Temperature sensor
        - 1 Unit Fan controls
            - Start/Stop relay(s)
            - Status current switch(es)
        - 1 Unit Temperature sensor(s)

        - Discharge Air Temperature
    - 1 Low-Limit Temperature switch
    - 1 Hot Water Control Valve (2-way 3/4"-1", Spring Return as basis) – Mechanical Installation by Others
    - 1 Space Temperature sensor w/ setpoint adjustment

High School Fieldhouse

- Building Level Network Controller
  - Provide and install 1 Honeywell CIPer Network Controller w/NEMA 1 enclosure, control transformer
  - 1 Graphics, Trending, Alarming
  - Installation of Elevated Network Communications Wire and conduit across Open Space
- Existing Johnson Dual NG/DX Units (Unit to remain)
  - Provide the following controls:
    - Integration of the BACnet Corel DDC Controller to the Niagara 4 Building Management System through a communications link.
    - Replace the existing Cooling Thermostat with a DDC Thermostat
    - 1 Graphics, Trending, Alarming
- Existing Honeywell WEBs Spyder Controller and Devices
  - Network connection to the Building Level Network Controller

Manasquan Elementary School

- Building Level Network Controller
  - Provide and install 1 Honeywell Building Level WEBs JACE Network Controller w/NEMA 1 enclosure, control transformer
- Integration of Existing Trane Building Management System to the Niagara 4 Platform
  - BMS – Trane: A Trane EMS controls the HVAC equipment, boilers, air handlers, and the package units. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, humidity, and heating water loop temperatures. The Integration shall consist of available integration LON points provided by the Trane BMS through a communications connection to the Trane BMS controllers.
    - Building Summary
    - Floor Plans
      - Area A1
      - Area A2
      - Area B
      - Area C1
      - Area C2
      - Area C2 Mezzanine
      - Area D1
      - Area D2

    - Area E1
    - Area E2
    - Area B Old Gymnasium
    - Area C Music Room
    - Area D Classrooms
    - Area E Classrooms
    - Area E Classrooms
    - Area E New Cafeteria
    - Area E New Gym
  - Cafeteria SZ-4
  - HV-1 Area (Kitchen)
  - Schedules
  - MZ-1
  - MZ-3 Library
  - Space Temperature Deviation
    - AC-1, 2,7, 8,9,10,13, MZ-1, MZ-3
  - RTUs Space Setpoints
    - RTU-1, RTU-5 (New Gym)
    - RTU-11, RTU-12 (Old Gym)
    - RTU-6 (New Kitchen)
    - RTU-14 (Music Room)
  - Heating Plant
    - BLR-1, BLR-2
    - HWP-1 – HWP-4
    - Hot Water System Temperatures
  - Single Zone Roof Top Units
  - RTUs with Reheats
  - Floors Plans
  - Penthouse Units
    - SZ-4 (Cafeteria)
      - (2) Reheat Coils (Boy's LR / Girl's LR)
    - MZ-1 A-Classroom (7 Zones) (A1 – A7)
    - MZ-3 Media Center (4 Zones)
      - Counselor Area
      - Library
      - Upper Level
      - Lower Level
  - Area
  - Points
  - Equipment Menu

  - AC-1 – AC-14
  - RTU-1 (Area E New Gym)
  - MZ-1, MZ-3 (Library), SZ-4 (Old Cafeteria)
- Exhaust Fans
  - EF-1,1A, PreAC-2, PreAC13, TEF2, TEK-16, PreAC7, PreAC8, FF-X, 2A, 2L, TEA1, TEK8, TEK10, GLR, BLR
- Space Summary
  - Cooling Setpoint, Heating Setpoint, Space Temperature
- 30 Exhaust Fans
- Hot Water Heating System
  - Boiler Room 1: 2 Condensing Boilers
  - Boiler Room 2: 1 Slant-Fin Non-Condensing Boiler
  - 6 heating hot water pumps. (2 VFD - 4 constant)
- RTU-1 (Multipurpose Room) (Area E New Gym)
- HV-1 SF
- AC-1 (Section A2 Classrooms) (Old Building Rear)
  - (6) Reheat Coils
    - Room 112 – Room 115
    - Corridor 183C/D
- AC-2 (Section A1 Classrooms) (Old Building Front)
  - (8) Reheat Coils
    - Room 101 – Room 108
- AC-5 (Multipurpose Room) (Area E New Gym)
- AC-6 (Kitchen) (Area E Cafeteria)
  - (1) Reheat Coil
    - Room 310
- AC-7 (Corridor 311) 303-308 (Area E New Addition)
  - (7) Reheat Coils
    - Room 305 – Room 308
    - Corridor 311
    - Vestibule 311A/B
- AC-8 (Gym Storage) 300-302 (Area E New Addition)
- AC-9 (Section D2 Classrooms)
- AC-10 (Main Office & Nurse) (Area C Administration)
- AC-11 (Gym) (Area B Old Gym)
- AC-12 (Gym) (Area B Old Gym)
- AC-13 (Section D1 Classrooms)
- AC-14 (Music) (Area C)
- 4 Unit Heater
- CR 202, 204, 205

- Electric Heating
  - (1) CR112
  - (2) Exterior
  - (3) Main Hallway 1
  - (2) Main Hallway 2
  - (2) Boys/Girls RR

- Network Architecture
  - Attic
    - UC600-1-1 (AC-2 RHC)
    - UC600-1-2 (AC-2 RHC)
    - UC600-1-3 (AC-3 RHC)
    - UC600-1-4 (AC-2 RHC)
    - UC600-4-3 (AC-1) (Conflicting locations)
    - UC600-4-4 (AC-1)
  - Penthouse
    - UC600-4-1 (MZ1)
    - UC600-4-2 (AC-1)
    - UC600-6-1 (MZ-3)
    - UC600-6-2 (SZ-4)
    - UC400-2 (Unit Heater)
  - Above Ceiling
    - UC600-2-1 (AC-13 RHC)
    - UC600-2-2 (AC-9 RHC)
    - UC600-2-3 (AC-9 RHC)
    - UC600-2-4 (AC-9 RHC)
    - UC600-3-1(AC-7 RHC)
    - UC600-3-2 (AC-8 RHC)
    - UC600-3-3 (AC-7 RHC)
    - UC600-4-3 (AC-1) (Conflicting locations)
    - UC600-3-4 (AC-7 & 8 RHC)
  - Not Located
    - MP581-7 Hot Water System
    - UC400-3 (Next to SC)
    - UC400-1-7 Music Electrical Room
    - UC600-5-1 (AC10 RHC)
    - UC600-5-2 (AC10 RHC)
    - UC600-5-3 (AC10 RHC)
- Provide field installation labor to rough-in the Unit Manufacturer provided temperature/CO2 sensors for the single zone rooftop units.
- Provide and install (75) standalone wall mounted HTRAM Honeywell CO2 sensors.

- Lon Network (Existing Honeywell by AME)
  - MZ-1 SF/RF (Area A-2)
    - A1 THRU A7
  - MZ-3 SF/RF (Area C2 - Library)
    - RM 143
    - Media Center
    - Media Center Lower Level
    - Media Center Upper Level
  - AHU SZ-4 (Cafeteria)
  - 2 PH A / B Unit Heaters
  - 2 Exhaust Fans (Boys/Girls)
  - 2 Heating Coils (Boys/Girls)
  - 1 Heat Exchanger/Pump

Manasquan High School

- Integration of Existing Building Management System
- Extend and install an additional 18 months of SMA on the existing Niagara 4 JACE
- Migrate the existing Graphics to the New front end Graphical User Interface.
  - Site Overview
  - 1931 Building
    - Floor Plans
      - Basement
      - First Floor
      - Second Floor
    - Hot Water System
      - Boilers (B-1, B-2)
      - Boiler Pumps (BP-1, BP-2)
      - Secondary Hot Water Pumps (SHWP-1, SHWP-2)
      - Variable Frequency Drive Details (SHWP-1, SHWP-2)
      - Hot Water Mixing Control Valve
      - Charts
      - Differential Bypass Valve and Pressure
      - Primary and Secondary Hot Water Temperatures
      - Boiler Room (EF-2 and UH-02)
      - Control Parameters and Setpoints
    - Chilled Water System
      - Chiller
      - Chiller Details
      - Chilled Water Pumps (PCHWP-1, PCHWP-2)
      - Variable Frequency Drive Details (PCHWP-1, PCHWP-2)

        - Differential Bypass Valve and Pressure
        - Chilled Water Flow
        - Control Parameters and Setpoints
        - Charts
    - AHU-01 (Auditorium)
        - Auditorium Fintube
    - AHU-02 (Cafeteria)
        - Cafeteria Fintube
    - ERU-01 (Classrooms and Offices) + Alarms + Charts
    - ERU-02 (Classrooms, Offices, Corridors) + Alarms + Charts
    - Equipment Overview
        - 1) Unit Ventilators (UV-01 – UV-25)
        - 2) Fan Coil Units (FCU-01 – FCU-12)
        - 3) VRF System (AC-01 – AC-11) (Front Office)
        - 4) Duct Heaters (DHC-01 – DHC-04) (Toilets)
        - 5) Unit Heaters (CUH-01 – CUH-05, UH-01, UH-04)
- 1995 Building
    - Floor Plans
        - Basement
        - First Floor
        - Second Floor
    - Hot Water System
        - Boilers (B-3, B-4)
        - Boiler Pumps (BP-3, BP-4)
        - Secondary Hot Water Pumps (SHWP-3, SHWP-4)
        - Variable Frequency Drive Details (SHWP-3, SHWP-4)
        - Hot Water Mixing Control Valve
        - Charts
        - Differential Bypass Valve and Pressure
        - Primary and Secondary Hot Water Temperatures
        - Boiler Room (EF-11 and UH-03)
        - Control Parameters and Setpoints
    - Chilled Water System
        - Chiller
        - Chiller Details
        - Chilled Water Pumps (PCHWP-3, PCHWP-4)
        - Variable Frequency Drive Details (PCHWP-3, PCHWP-4)
        - Differential Bypass Valve and Pressure
        - Chilled Water Flow
        - Control Parameters and Setpoints

- Equipment Overview
  - Unit Ventilators (UV-09,26-39)
  - VAV Boxes (VAV3-01 – 3-05, 4-01 – 4-04, 5-01 – 5-06
  - Exhaust Fans
  - Unit Heaters (CUH-06 – CUH-10)
  - Air Handling Units
  - AHU-03 (TV Production)
  - AHU-04 (Audio, Video)
  - AHU-05 (Media Center)
- Equipment
  - Unit Ventilator + Charts
  - VAV + Charts
  - AHU (AHU-0#, Charts, VAV Table)
  - Cabinet Unit Heaters

- 2018 Building
  - Floor Plans
    - Basement
    - First Floor
    - Second Floor
  - RTU Summary
    - 1) AC-1 Gym Boy's Side
    - 2) AC-1A Gym Center
    - 3) AC-1B Gym Girl's Side
    - 4) AC-2 Boy's Locker Room
    - 5) AC-3 Boys' Team Room
    - 6) AC-4 Lobby
    - 7) AC-5 Girl's Locker Room
    - 8) AC-6 Girls' Team Room
  - HRU Summary
    - HRU
  - VRF System (Basement)
    - Health Room
    - Music Room
    - Teacher Workroom
    - Music Office
    - Basement Hallway
  - VRF System (1st Floor)
    - Room 301
    - Room 301A
    - Room 302

- Room 303
- Room 304
- Room 304A
- First Floor Hallway

- VRF System (3rd Floor)
  - Room 351
  - Room 351A
  - Room 352
  - Room 353
  - Room 354
  - Room 354A
  - Second Floor Hallway
  - MDF Office
  - IDF Closet
- Unit Heaters
  - Gym Storage
  - Field Equipment
  - Field Men's Room
  - Field Women's Room
- Cabinet Unit Heaters
  - Lobby
  - Girl's LR Vestibule
  - Boy's LR Vestibule
  - CUH Stair A
  - CUH Corridor 300
  - CUH Stairway B
- Hood Exhaust Fans
  - HEF-2 Lab 351
  - HEF-6 Lab 353
  - HEF-12 Lab 303
  - HEF-17 Lab 301
- Exhaust Fans
  - EF-23 Toilet 1st Floor
  - EF-4 Gymnasium
  - EEF-32 Athletic Director
  - EEF-27 Girl's LR
  - EEF-24 Boy's LR Shower
  - EEF-25 Boy's LR Office
  - EEF-30 Boy's LR Office Toilet
  - EEF-33 Boy's LR Toilet

- TF-1 Bathrooms 2nd Floor
- EEF-31 Field Restrooms

- Emergency Exhaust Fans
  - EF-3 Lab 304A
  - EF-5 Lab 301A
  - EF-8 Lab 304
  - EF-9 Lab 303
  - EF-10 Lab 301
  - EF-14 Lab 351
  - EF-15 Lab 351A
  - EF-18 Lab 353
  - EF-19 Lab 354
  - EF-20 Lab 354A
- Radiant Heat (Basement)
  - Teacher Workroom 602B
  - Tech Office 602C
  - Music Room
  - Health Room
- Radiant Heat (First Floor)
  - Science Lab 301
  - Science Lab 303
  - Science Labe 304
  - Men's Restroom
  - Women's Restroom
  - Fire Sprinkler Room
  - Janitor's Closet
- Radiant Heat (Second Floor)
  - Science Lab 351
  - Science Lab 353
  - MDF Office
  - Bathroom 357&358
  - Science Lab 354
- Radiant Heat (Gym)
  - Gym Boy's Side
  - Athletic Trainer
  - Gym Center 4) Gym Girl's Side
- Radiant Heat (Boy's Locker Room)
  - Boy's LR Office #1
  - Boy's LR Office #2
  - Boy's LR Office #3

- Boy's LR Office Restroom
- Boy's LR Restroom
- Boy's LR Storage #1
- Boy's LR Storage #2
- Boys' Team Room

- Radiant Heat (Girl's Locker Room)
  - Girl's LR Office
  - Girl's LR Office Restroom
  - Girl's LR Storage
  - Girl's LR Restroom

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

The baseline adjustment calculations are included with the energy calculations.

CHANGES IN INFRASTRUCTURE

None.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

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

Environmental Issues

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

ECM 3B CO2 Controls

The key benefits of this ECM include:

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

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weightroom
3B CO2 Controls			●		●	

PROPOSED SOLUTION

Carbon Dioxide Monitoring device is required to qualify for both the replacement and refurbishment pathway of the School and Small Business Ventilation and Energy Efficiency and Verification and Repair Program (SSB-VEEVR). For a school building, to ensure proper ventilation is maintained throughout the school year, all classrooms in schools receiving Grant shall be equipped with a carbon dioxide (CO2) monitor. The CO2 monitor device will display the carbon dioxide readings to the teacher through a display on the device or other means such as a web-based application or cellular telephone application. A notification will be provided to teachers when the carbon dioxide levels in the classroom have exceeded 1,100 ppm.

Typical Wall-Mounted CO2 Sensors

Typical Wall-Mounted CO2 Sensors

CO2 MONITOR SCOPE OF WORK

New CO2 Monitor Scope of Work

Building	RTU Replacement	Unit Ventilator Replacements	Total
Manasquan Elementary School	12		**12**
Industrial Arts Building		5	**5**

CHANGES IN INFRASTRUCTURE

New carbon dioxide monitoring devices will be installed.

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

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

ENVIRONMENTAL ISSUES

Resource Use	Energy savings will result from higher unit efficiency.
Waste Production	None.
Environmental Regulations	No environmental impact is expected.

ECM 4A SSB-VEER Assessment and Verification

The key benefits of this ECM include:

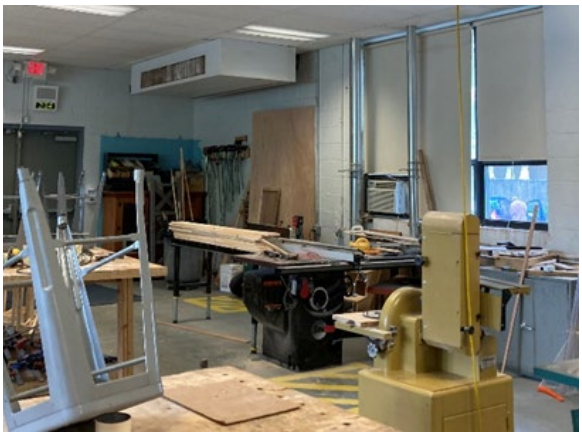
- Reduced energy usage from improved energy efficiency resulting from unit retrofit.
- Lower operational costs through less frequent maintenance and operational issues.
- Increased comfort of students and teachers.

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weightroom
4A SSB-VEER Assessment and Verification			●		●	

PROPOSED SOLUTION

HVAC Assessment and Replacement/New System Pathway will be made for the purchase and installation of a new HVAC system or unit, by way of replacement, addition, or otherwise. Honeywell shall provide supporting documentation showing that the existing HVAC equipment (or lack thereof) is unable to meet the minimum ventilation and filtration standards described in this School and Small Business Ventilation and Energy Efficiency and Verification and Repair Program (SSB-VEEVR) Guide without an HVAC system or unit replacement. All proposed new systems or HVAC system replacements will meet or exceed the ventilation and filtration standards described in SSB-VEEVR Guide, and the new or replacement HVAC system must also meet the necessary and cost-effectiveness standards set forth in this Guide.

Manasquan Elementary School RTU



Industrial Arts Building Univent

EXISTING EQUIPMENT FOR ASSESSMENT ANDF VERIFICATION SCOPE OF WORK

Assessment and Verification Scope of Work

Building	RTU Replacement	Unit Ventilator Replacements	Total
Manasquan Elementary School	12		12
Industrial Arts Building		5	5

CHANGES IN INFRASTRUCTURE

None

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

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

ENVIRONMENTAL ISSUES

Resource Use	Energy savings will result from higher unit efficiency.
Waste Production	None.
Environmental Regulations	No environmental impact is expected.

ECM 5A Solar Power Purchase Agreement (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 Manasquan 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 third-party system owner
- **No upfront costs**

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
5A 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) 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

Typical Rooftop Solar Array

Typical Parking Lot Solar Array

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 the solar PPA system at the potential buildings listed in the chart below.

Proposed Solar PPA System

Building	Type	kW DC	kWh AC Generated
Manasquan High School	PPA	495.8	701,726
Manasquan Elementary School	PPA	455.4	644,599
Total		**951.2**	**1,346,325**

Potential Solar Arrays – New Building

Potential Solar Arrays - Manasquan ES

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 6A Design Allowance - Capital Improvement

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weightroom
6A Design Allowance	●	●	●	●	●	●

EXISTING CONDITIONS

During project design or construction, minor modifications to the project might be identified. For example, piping or equipment might need to be modified to complete ECM.

PROPOSED SOLUTION

Design Allowance is a customer-controlled set-aside to address any minor modifications during the project.

CHANGES IN INFRASTRUCTURE

None

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

None.

ENVIRONMENTAL ISSUES

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

ECM 7A Permanent Load Reduction

The key benefits of this ECM include:

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

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
7A Permanent Load Reduction	●	●	●	●	●	●

ECM OVERVIEW

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

Manasquan ES - Electric Meter

Manasquan HS – Electric Meter

PJM CAPACITY MARKET PROGRAM

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

Permanent Load Reduction KW per Building

Building	Permanent Load Reduction (KW)
Administrative Building	3
Manasquan High School	34
Manasquan Elementary School	53
Alternative School	1
Industrial Arts Building	3
MHS Warehouse/Weight room	1
Total	**95**

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

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

PROPOSED SOLUTION

Honeywell proposes to work with a PJM Regional Transmission Organization (RTO) CSR to implement a Demand Response energy curtailment program which will generate revenue streams for the School District. Honeywell's Demand Response agent acting as the CSP will notify the district prior to potential events in order to advise and coordinate load curtailment participation in accordance with RTO program requirements and will work with the School District to benefit from energy efficiency improvements.

The PJM Markets are further described below.

The PJM Energy Efficiency Program

Energy efficiency measures consist of installing more efficient devices or implementing more efficient processes and systems that exceed then-current building codes or other relevant standards. An energy efficiency resource must achieve a permanent, continuous reduction in demand for electricity. Energy efficiency measures are fully implemented throughout the delivery year without any requirement of notice, dispatch, or operator intervention. A demand response resource can reduce its demand for electricity when instructed. This means PJM considers it a "dispatchable resource." A demand response resource can participate in the RPM market for as long as its ability to reduce its demand continues. A demand response resource must be willing to reduce demand for electricity up to 10 times each year when called for a reduction. In a year without any reduction calls, the demand response resource is required to

demonstrate the ability to reduce demand for electricity during a test of reduction capability. Data will be submitted by the demand response resource to prove compliance with reductions from actual calls or reductions from capability tests. An energy efficiency resource is one that reduced their demand for electricity through an energy efficiency measure that does not require any additional action by the consumer.

ENERGY SAVINGS METHODOLOGY AND RESULTS

Revenue is generated through participation in the PJM DR program.

CHANGES IN INFRASTRUCTURE

None

CUSTOMER SUPPORT AND COORDINATION WITH UTILITIES

Initiation of demand response curtailment will be required.

ENVIRONMENTAL ISSUES

Resource Use	None.
Waste Production	This measure will produce no waste by-products.
Environmental Regulations	None.

ECM 8A 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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
8A 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 30–50% 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.

Manasquan ES - Building Envelope

Manasquan HS - 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

Scope	Administrative Building	Alternative School	Industrial Arts Building	Manasquan Elementary School	Manasquan High School	Weightroom	Total Quantity
Attic Bypass Air Sealing (SF)					8,841		8,841
Attic Flat Insulation (SF)					8,641	1,775	10,416
Construct Walkway (SF)					200		200
Door - Install Jamb Spacer (Units)					4		4
Door Weather Striping - Doubles (Units)				19	12		31
Door Weather Stripping - Singles (Units)	9			9	3	2	23
Insulation Soffit Baffles (UT)						59	59
Overhang Air Sealing (LF)				67			67
Overhang Air Sealing (SF)				60	72		132
Overhead Door Weather Stripping (Units)						1	1
Recess Light Air Sealing (Units)					24		24
Retrofit Attic Hatch (Units)					1	2	3
Roll-Up Door Weather Stripping (Units)						1	1
Roof-Wall Intersection Air Sealing (LF)				1,256	311		1,567
Roof-Wall Intersection Air Sealing (SF)					320		320
Tent Over Attic Pipes (LF)					70		70
Wall Air Sealing (SF)				294			294
Capital Improvements							
Attic Air Barrier Retrofit (SF)		715	4,000				4,715
Attic Flat Insulation (SF)			4,000				4,000
Door Weather Striping - Doubles (Units)			4				4
Door Weather Stripping - Singles (Units)		3					3
Install New Attic Hatch (Units)		1	2				3
Insulation Soffit Baffles (UT)			120				120
Roof Insulation (SF)		1,104					1,104
Wall Insulation (SF)		60					60

Roof-Wall Joints

- **Existing** – Buildings throughout Manasquan Schools 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** – We found that 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.

Windows

- **Existing** – The operable windows in most of your buildings could present air leak issues that require weather stripping with fuzz or gasket type materials.
- **Proposed** – Honeywell recommends installing weather stripping and door sweeps to prevent air leak.

Doors

- **Existing** – Doors in this facility need full 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.

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 9A CHP (Cogeneration)

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	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
9A Cogeneration CHP		●				

EXISTING CONDITIONS

No Combined Heat and Power (i.e., cogeneration) units are currently located within the Manasquan Public 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 mCHP 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

Proposed Cogeneration Units

Building	Type	Manufacturer	KW	Model
Manasquan High School	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 10A Sustainable Transportation – Electric Vehicle (EV) Chargers

The key benefits of this ECM include:

- **Increased Sustainability** from encouraging the use of pollution-free transportation
- **Tangible Learning Experience** by integrating educational materials with on-site student experience

ECM Description	Administrative Building	Manasquan High School	Manasquan Elementary School	Alternative School	Industrial Arts Building	MHS Warehouse/ Weight room
10A Sustainable Transportation - EV Chargers		●	●			

ECM OVERVIEW

Honeywell will seek to increase the availability of eco-friendly transportation options for staff and parents by providing Electric Vehicle charging stations at each of your schools.

EXISTING CONDITIONS

There are no Electric Vehicle (EV) Charging Stations currently located at the District facilities.

Sample Level 2 EV Chargers

Sample Level 2 EV Chargers

PROPOSED SOLUTION

Honeywell proposes to install multiple Level 2 EV Chargers at the locations outlined below. These chargers are capable of increasing the battery charge of electric vehicles by up to 25 miles (of range) per hour. With a five-year prepaid ChargePoint cloud plan, the District can operate and customize charging stations to meet specific requirements. Some of the most widely used features include:

1. Set the price that drivers pay to use charging stations based on energy cost, duration, time of use, session length, or driver group. Funds collected from drivers are electronically transferred to a designated bank account. For example, staff who work for the District may be allowed to use the chargers for free, while visitors may be charged for a certain price per kWh. This can help generate revenue for the District.
2. Advanced access controls manage which drivers can access stations and when. The chargers may be set available for staff and students only during school hours, and open for public after school hours.
3. Waitlist makes charging more convenient by notifying drivers when a charging spot becomes available for them and holding it until they can plug in their vehicle.

With new state-wide incentives available towards the installation of up to six chargers per site, this can be a cost-effective way to integrate the future of transportation into your District's buildings.

Proposed EV Charging Stations

Location	Make	Model	Qty
Manasquan High School	ChargePointe	CT4021	1
Manasquan Elementary School	ChargePointe	CT4021	1
Total			**2**

CHANGES IN INFRASTRUCTURE

New EV Chargers will be installed as part of this measure.

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	An increase in electrical use may occur due to this ECM, offset by revenue generated from charging stations.
Waste Production	Any discarded components will be disposed of properly.
Environmental Regulations	Reduced pollution from staff and parent vehicles is expected.

Project Development and Management Overview

Honeywell approaches any ESIP project with a systematic, tested, and proven delivery process based upon industry best practices including strong project management, open and collaborative communication, superior technical design, and state-of-the-art technologies. We go above and beyond, with multiple New Jersey delivery teams to ensure enough resources, meticulous and thorough training and commissioning, and robust maintenance planning that goes the extra mile for the long term. Honeywell excels at project delivery because of our experience in New Jersey delivering ESIP projects with results that meet or exceed expectations.

Honeywell will demonstrate our partnership-based commitment to the District throughout the development and delivery of your ESIP project, as we have done for dozens of other K-12 school districts throughout New Jersey under the ESIP Law. Our approach is backed by our references and track record and highly experienced engineering resources, which will be fully utilized to help you achieve your unique project goals and requirements.

Honeywell prescribes four phases in the ESIP Process that constitutes your project, including:

- **Phase 1**: IGA
- **Phase 2**: Project Implementation
- **Phase 3**: Commissioning and Training
- **Phase 4:** Energy Savings Guarantee Period

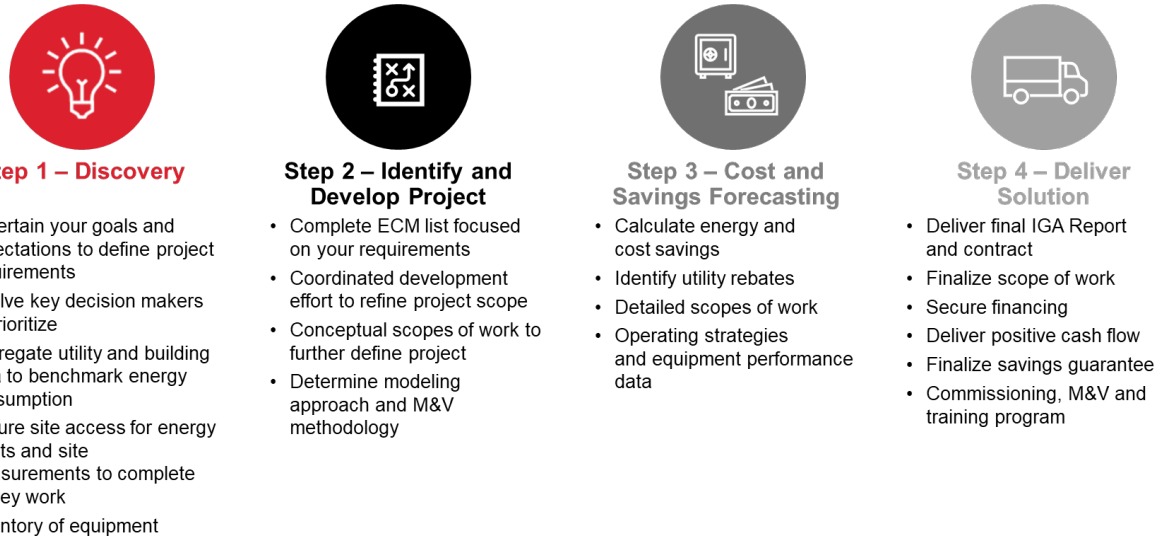
The IGA will commence with a kickoff meeting between key project stakeholders of the District and Honeywell to review the ESIP process, including the expectations of both parties during the IGA, audit parameters, reporting methods, building access protocols, availability of utility, and building data. Phase 2 will commence after our kickoff meeting has concluded with agreed upon next steps.

Honeywell takes a holistic approach in development of a comprehensive solution that is customized to meet your operational and facility needs and project goals. Our integrated project delivery approach supports continuous and collaborative communication between key stakeholders throughout the process.

A. IGA Development Process

Honeywell's IGA development process includes the steps identified.

Figure 1. IGA Development Process



Step 1: Discovery

The first step of your IGA is to gain a thorough comprehension of the District's key priorities and requirements. Honeywell will work with you to identify what your key needs and goals include and investigate your buildings and systems with that in mind during this step.

Honeywell will initiate your IGA shortly after formal selection with a kickoff meeting involving all key project decision makers of the District and Honeywell. The purpose of this meeting is to establish preliminary project expectations and define key next steps of the process to inform the IGA. Honeywell will develop a customized plan for developing an efficient, cost-effective solutions-based project including schedule, finance, performance requirements, and scheduling activities.

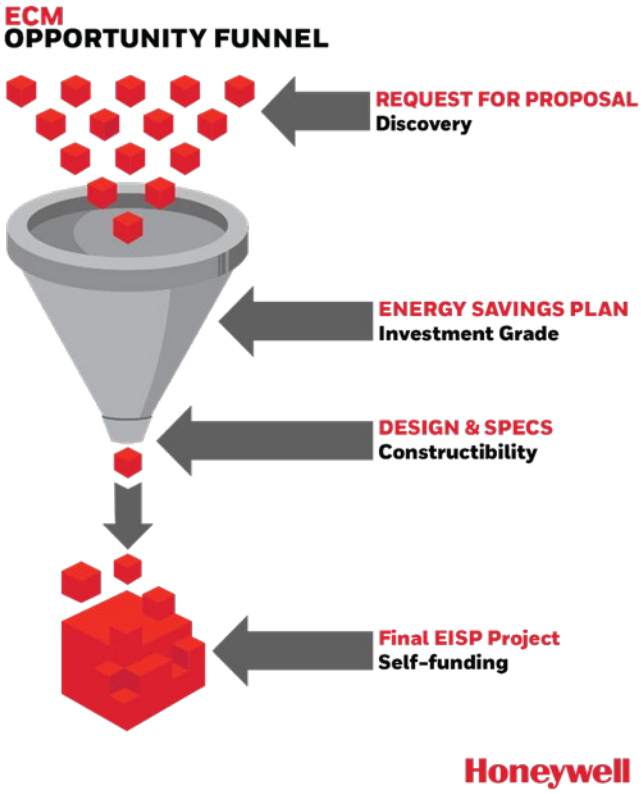
Honeywell will schedule site visits to commence at the earliest convenience. Utility data is a key component used for establishing your energy baseline to project potential energy savings. Building plans and operating schedules will assist Honeywell to focus our time during the site visits and serve to provide the means for our engineers to complete their calculations. Data required for this step includes 24 months of electric, thermal, water/sewer data, original and renovation drawings, equipment lists, equipment operating schedules, occupancy data, maintenance records, and repair costs.

Our goal for the site surveys is to understand your systems in each facility and to identify potential ECMs for inclusion in your final project scope. This step allows Honeywell to determine needed improvements by evaluating each building and its systems in terms of condition, performance and age, including lighting and HVAC systems, Building Automation Systems (BMS), building envelopes, electrical distribution, domestic water, and heating systems.

Step 2: Identify and Develop Project

Honeywell will take the findings of our earlier diagnostic phase to develop solutions that address your priorities and key needs as ascertained in Step 1. Our collaborative, solutions-based approach will allow you to maximize savings to invest more into modernizing buildings and generate maximum rebates to help deliver the most positive cash flow available.

Figure 2. ECM Opportunity Funnel



Our primary objective is to ensure quality control and on time delivery throughout your project. Your project will have a dedicated team consisting of project management and engineering who have helped deliver similarly sized project under ESIP in recent past.

Honeywell will create an exhaustive ECM list following the completion of the site survey process. Each opportunity is then analyzed individually to determine both economic and construction feasibility. Input from the District is critical to determine how each ECM fits within your overall project priorities. Honeywell's ECM Opportunity Funnel (**Figure 5**) will help further narrow down the list of potential ECMs to your final ESIP project scope, by analyzing all aspects of your energy consumption to deliver an optimal project scope based on realistic savings potential. Our unique collaborative approach ensures we deliver on your expectations while providing for turnkey solutions that are cost effective.

Step 3: Cost and Savings Forecasting

Honeywell will then move on to analyze and quantify your unique savings guarantee utilizing the District's dedicated ESIP Team. During this step, we will quantify energy savings by identifying the scope of work and its impact on your facilities and systems. We will measure individual ECMs based on how they will impact future performance of the building. This will help to ensure the ECM savings are accounted for only once. Results are then subject to peer reviews to verify accurate modeling and savings forecasts based on the proposed scope of work. Honeywell's unique approach to engineering is why we often exceed the savings guarantee of our contracts.

Step 4: Deliver Solution

Honeywell will leverage our experience delivering more than two dozen New Jersey ESIP projects since 2009 to help the District complete a successful project on time that maximizes realistic savings, cash rebates and positive cash flow. We have learned through this unrivaled experience that what matters most is to meet your expectations and ensure your involvement in the decision-making process. The Rebate Energy Analysis Constructability Tool (REACT) will provide for an interactive solution development experience designed to maximize NJ Office of Clean Energy rebates. Our No Change Orders policy (which helps distinguish Honeywell from the competition) will further reduce risk and enhance project results.

Our in-house finance team, Honeywell Global Finance (HGF), will work to ensure that you secure the most competitive financial offering and interest rate available. ***No ESCO offers more value throughout the ESIP Process than Honeywell***.

Figure 6 identifies Deliverables.

Figure 3. Deliverables

B. Honeywell Performance Contracting

Honeywell is the undisputed performance contracting market leader in the Northeast. Honeywell's Guaranteed Performance Contracting, which we pioneered in the early 1980s, has surpassed $2 Billion in cumulative sales. Our performance contracting business features specialized and dedicated resources, including people with expertise specifically to address the needs of our customers. Our portfolio of business experience in the region is over 400 projects and over $500 Million in project investment.

C. Project Management Policy: Honeywell's Commitment to Health, Safety, the Environment, and the District

All of Honeywell's Project Management Plans (PMPs) begin with Safety. By integrating health, safety, and environmental considerations into all aspects of our business, we help our customers, our people, and the environment achieve sustainable growth and accelerated productivity, drive compliance with all applicable regulations, and develop the technologies that expand the sustainable capacity of our world. Our health, safety, and environment management systems reflect our values and help us meet our customers' needs and our business objectives.

Our Safety Commitment to Schools

In today's world, nothing is more important than safeguarding our families at home, at work, and at school. Through Honeywell's safety awareness process, we commit to our customers to protect and safeguard our construction sites, our employees, sub-contractors, your staff, and most of all your children.

Our projects all begin with the following steps:

- Safety training for employee's and sub-contractors
- Detailed work schedules around the school day
- Detailed background checks of personnel
- Detail logs of sub-contractor personnel
- On-site logs of time sheets contact information for all personnel
- Clearly displayed identification badges of all construction personnel
- On-site daily supervision of all sub-contractors
- Detailed and weekly reviews of accident reports and remediation strategy

Our Safety Commitment to Our Customers and Employees

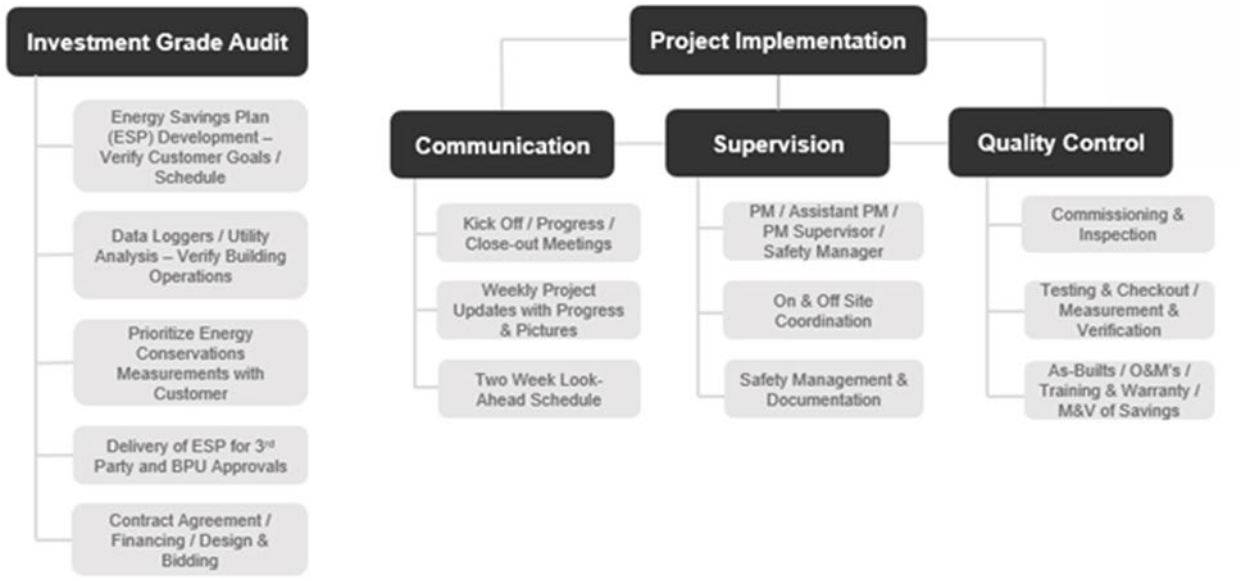
We protect the safety and health of our customers and employees through prevention of illness, injury, and pollution.

- We actively promote and develop opportunities for expanding sustainable capacity by increasing fuel efficiency, improving security and safety, and reducing emissions of harmful pollutants.
- We are committed to compliance with all our health, safety, environmental and legal requirements everywhere we operate.
- Our commitment to health, safety, and the environment is an integral aspect of our design of products, processes and services, and of the lifecycle management of our products.
- Our management systems apply a global standard that provides protection of both human health and the environment during normal and emergency situations.
- We identify, control, and endeavor to reduce emissions, waste and inefficient use of resources, and energy.
- We abide by the Company's own strict standards in cases where local laws are less stringent.
- Our senior leadership and individual employees are accountable for their role in meeting our commitments.
- We measure and periodically review our progress and strive for continuous improvement.
- These are our commitments to health, safety, and the environment and to creating a safe, clean, environment everywhere we operate.

D. Project Management Process

The Project Management Process, illustrated in the figure below, applies technical knowledge, people, communication skills, and management talent in an on-site, pro-active manner to ensure that our contract commitments are met on time, within budget, and at the quality you expect.

Figure 4. Project Management Process



A Honeywell PMP defines plans and controls the tasks that must be completed for your project. But more than task administration, our project management process oversees the efficient allocation of resources to complete those tasks.

Each project and each customer's requirements are unique. At Honeywell, we address customer needs through a formal communication process. This begins by designating one of our project managers to be responsible for keeping the customer abreast of the status of the project.

As the facilities improvements portion of the partnership begins, the Project Manager serves as a single focal point of responsibility for all aspects of the partnership. The Project Manager monitors labor, material, and project modifications related to the District – Honeywell partnership and makes changes to ensure achievement of performance requirements in the facilities modernization component. The Project Manager regularly reviews the on-going process of the project with the customers.

The Project Manager will develop and maintain effective on-going contact with the District and all other project participants to resolve issues and update project status.

There are several challenges in this position. The Project Manager must staff the project and create a work force capable of handling the technologies associated with the project (pneumatic or electric/electronic controls, mechanical systems, etc.), and plan for and use these personnel to achieve optimum results focused on occupant comfort and guarantee requirements.

E. Construction Management

Prior to any work in the buildings, our Project Manager, Wyatt Ferguson, will meet with your administrative and building staff to outline the ECMs we will be installing in your buildings. We will discuss proper contractor protocol of checking in and out of the buildings daily, wearing identifiable shirts, and checking in with your facilities staff. We will coordinate certain projects for different times of the day, so we do not interrupt the building and learning environments. Our staff will work a combination of first and second shifts to accomplish the pre-set implementation schedule.

Communication is the key success factor in any construction management plan and our project manager will be the key focal point during the installation process.

Our team will endeavor to prevent schedule slippages by continuously tracking the location of all equipment and components required for the project. We make sure all equipment and components will be delivered on time prior to the scheduled date of delivery. Our thorough survey, evaluation, and analysis of existing conditions, performed prior to the commencement of construction, will also prevent schedule slippages.

Honeywell is required to subcontract various portions of our projects to local contractors. Within the District's project, all subcontractors will be selected in accordance with New Jersey public contracts law. Typical areas that are subcontracted are as follows:

- Electrical Installation
- Water Conservation (Plumbing)
- HVAC Installation (depends upon the project size and scope)
- Associated General Contracting specialty items to support the project etc., (ceilings, windows, concrete, structural steel, roofing, demolition and removal of equipment, painting, and rigging)

Honeywell uses the following guidelines in hiring subcontractors to perform work on our projects.

- Local Presence in the Community (Customer Recommendations)
- Firm's Qualifications and WBE/MBE Status
- Firm's Financial Stability
- Ability to perform the work within the project timeline
- Price
- Ability to provide service on the equipment or materials installed over a long period
- Approval of subcontractors that Honeywell proposes to use lies with the District

F. Commissioning

Honeywell provides full commissioning of ECMs as part of our responsibility on this project. We will customize this process based on the complexity of ECMs. Specifically, Honeywell will be responsible for start-up and commissioning of the new equipment and systems to be installed during the project. This will include verifying that the installed equipment meets specifications, is installed and started up in accordance with manufacturer's recommendations and operates as intended. A commissioning plan will be prepared that describes the functional tests to be performed on the equipment and the acceptance criteria.

Prior to the District acceptance of the project, Honeywell submits the final commissioning report containing signed acceptance sheets for each ECM. Signed acceptance sheets are obtained upon demonstrating the functionality of each ECM to a District appointed representative.

Additionally, Honeywell provides training for facility operators and personnel as needed when each ECM is completed and placed into service. All training is documented in the final commissioning report.

After the completion of the Honeywell commissioning effort, in accordance with New Jersey ESIP legislation, the District will be required to secure the services of a third-party independent firm to verify the new equipment and systems meet the standards set forth in the Energy Savings Plan. To maintain the independence of this review, these costs must be born directly by the District. However, at the option of the District, these services can be financed as a portion of the total project cost.

Description of Savings Calculations, Monitoring, Measurement and FF Verification, and Program Guarantee

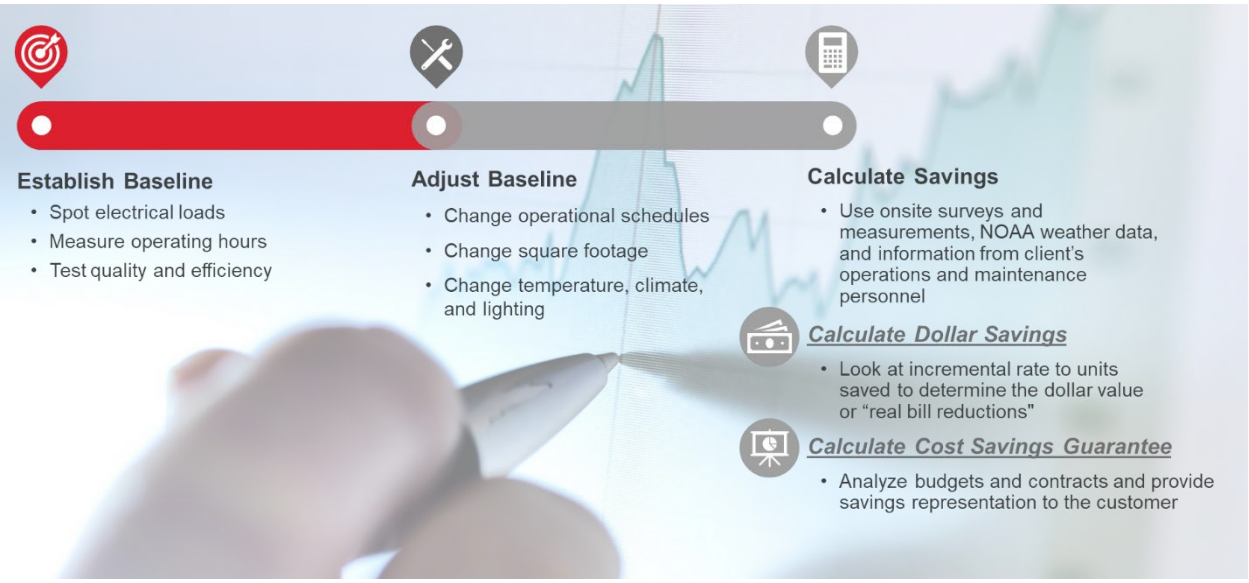
A. Baseline

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 will calculate the baseline based on the systems and operating conditions as they currently exist. Honeywell finds baseline development 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.

The following figure illustrates the process for establishing the baseline calculation.

Figure 5. Establishing Baseline Calculation



A summary of some of the methods, which will be 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 and 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 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, Honeywell's auditors use the following equipment for their onsite measurements:

1. Recording and instantaneous power analyzers as well as 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. For example, it is relatively easy to meter representative lighting 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 an accurate and cost-effective method.

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. 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. Honeywell always reviews every project in detail for the anticipated savings and never hesitates to reduce the anticipated energy calculations where experience dictates necessary. The result is a coupled project where the final savings are equal to or greater than anticipated.

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 and the District will establish 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.

B. Adjustment to Baseline Methodology

Honeywell's 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 & Verification (M&V) the 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 Honeywell installed ECMs. This creates the ability over the life of the contract to continue measuring only savings achieved by Honeywell 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 adjusting the baseline.

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

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:

- Changes in the amount of space being air conditioned
- Changes in auxiliary systems (towers, pumps, etc.)
- 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, Honeywell will 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 Watts/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.

C. 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 Operations and Maintenance (O&M) savings.

Typically, the following data is gathered:

1. Local weather data
2. Utility bills and sub-metered consumption trends
3. Utility rate structure
4. Facility use and occupancy data
5. Internal equipment loads
6. Interviews of operations and maintenance staff and management
7. Building construction, age, use and layout

8. Schematics of energy and water distribution systems
9. Identification and inventory of HVAC equipment
10. Identification and inventory of process equipment
11. Design, configuration, and operating characteristics of HVAC systems
12. Design, configuration, and operating characteristics of process systems
13. Control strategies and sequences of operation for HVAC and other process equipment
14. Identification and count of all lighting fixtures and determination of power consumption for each type
15. Identification and inventory of lighting control methods
16. Measurement of foot-candle levels at sample locations
17. Power quality and harmonics, power factor
18. Indoor air quality issues

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

$$AnnualSavings(\$) = \sum_{m=1}^{12} \{(Rate_{kWh,Base} \times kWh_{Saved,m}) + (Rate_{fuel\ Oil,\ Base} \times Fuel\ Oil_{Saved,\ gal,\ m}) + (Rate_{Steam,\ Base} \times Steam_{Saved,\ klbs,\ m}) + (Rate_{NG} \times NG_{Saved,\ MCF,\ m})\} + Agreed(\$)$$

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 there is an average value to savings. Honeywell looks at each incremental rate to units saved to properly determine the value (dollar) to the District or “real bill reductions.” As noted in the RFP, energy escalation rates will be established in accordance with New Jersey Board of Public Utility guidelines. Based on this, Honeywell will review all utility bills (hourly data), tariffs, special contracts, and commodity contracts to develop the incremental value (costs) of each utility.

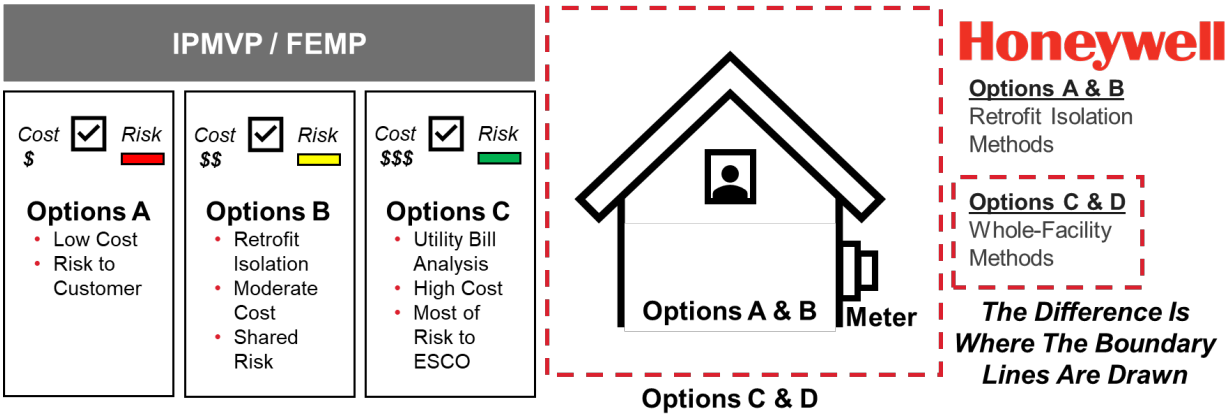
The O&M savings are typically a function of the existing District budgets (labor and direct costs), maintenance contracts, and operations (supplier) contracts. Honeywell will analyze the information to provide a conservative savings representation for District review and acceptance. The information will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

D. M&V

The purpose of performing M&V is to establish an agreed-upon process that provides the customer satisfaction that the improvements have been delivered and ongoing information regarding 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 District agree on a mutually acceptable methodology for measuring and verifying energy savings that are attributable to the ECMs Honeywell installs. This M&V plan provides the procedures to document the energy and cost savings of each of the proposed ECMs.

Figure 6. IPMVP / FEMP



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). Our approach to M&V is directly consistent and in compliance with the IPMVP and the Federal Energy Management Program (FEMP) M&V guidelines. 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 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 the installed equipment is performing at expected levels. It is assumed that the 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 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 control interfaces to both confirm operating status and to download trend data to verify proper equipment maintenance.

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 the District

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.

GENERAL APPROACH TO M&V

The IPMVP guidelines classify the M&V procedures into four categories: Options A, B, C, and D. The specific option to be used per ECM will be defined in the implementation contract once the final ECMs are selected. As shown in M&V Options Summary table below, these options differ in their approach to the level of complexity of the M&V procedures.

FEMP* Guidelines / Option	Verification of Potential to Perform (and Generate Savings)	Verification of Performance (Savings)	Performance Verification Techniques
Option A - Verifying that the opportunity has the potential to perform and to generate savings.	Yes	Yes	Engineering calculations with metering and monitoring throughout term of contract with varying level of measurement.
Option B - Verifying that the opportunity has the potential to perform and verifying actual performance by end use.	Yes	Yes	Engineering calculations with metering and monitoring throughout term of contract with measurement of all variables.
Option C - Verifying that the opportunity has the potential to perform and verifying actual performance (whole building analysis).	Yes	Yes	Utility meter billing analysis.
Option D - Simulating that the opportunity has the potential to perform and simulating actual performance.	Yes	Yes	Computer simulation.

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 include 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 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:

- Verifying the potential of the ECM to generate savings also stated as confirming the proper equipment/systems were installed, are performing to specification and have the potential to generate the predicted savings
- 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 verification will be conducted by both Honeywell and the District to ensure the proper equipment and systems were installed, are operating correctly, and have the potential to generate the predicted savings. Verification methods may include surveys, inspections, and spot or short-term metering.

REGULAR INTERVAL POST-INSTALLATION VERIFICATION

At least annually, Honeywell will verify the installed equipment and 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.

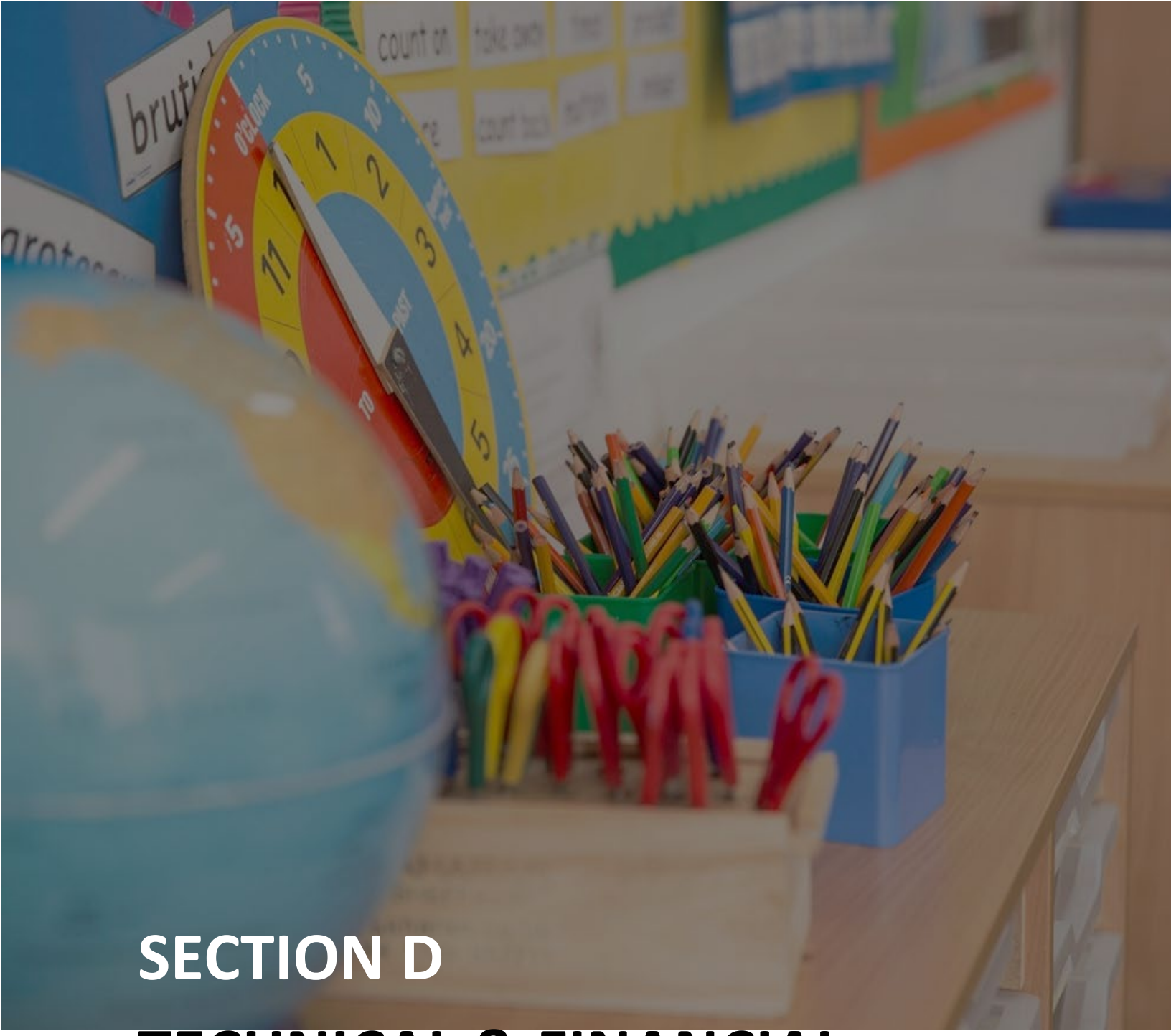
COMPUTATION OF ENERGY SAVINGS

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 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.



SECTION D

TECHNICAL & FINANCIAL SUMMARY

Section D – Technical & Financial Summary

1. Recommended ESIP Project

Recommended ESIP Project	
Value of Project	$3,197,393
Term of Repayment	15
Projected Savings Over Term	$1,021,903
Projected Rebates & Incentives	$77,559
Projected Interest Rate	4.0%

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
MANASQUAN PUBLIC SCHOOL DISTRICT
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: Honeywell International

Proposed Preliminary Energy Savings Plan: ECMs (Base Project)	Estimated Installed Hard Costs [1] $	Estimated Annual Savings $	Estimated Simple Payback (years)
1A LED Lighting Upgrades	$ 351,200	$ 37,562	9.35
2A Boiler Replacements	$ 57,491	$ 1,204	47.75
2C Replace Univentilators in Industrial Arts Building	$ 198,076	$ 586	337.73
2D Rooftop Unit Replacement	$ 1,536,462	$ 23,199	66.23
3A Building Management System Upgrades	$ 123,261	$ 19,609	6.29
4A SSB-VEER Assessment and Verification	$ 98,242	$ -	-
5A Solar PPA	$ 26,713	$ 77,237	0.35
Totals:	$ 2,391,446	$ 159,397	15.00

Optional ECMs Considered, but not included with base project at this time	Estimated Installed Hard Costs [1] $	Estimated Annual Savings $	Estimated Simple Payback (years)
1B Lighting Controls	$ 125,162	$ 2,557	48.94
1C De-Stratification Fans w/ UV Disinfection	$ 143,100	$ 5,127	27.91
2E Kitchen Hood Controllers	$ 98,255	$ 2,757	35.64
2F Premium Efficiency Motors and VFDs	$ 89,002	$ 753	118.15
2G Split System Replacements	$ 255,237	$ 1,072	238.18
2H Walk-In Compressor Controls	$ 14,738	$ 472	31.24
2I Burner Replacements and Controls	$ 147,382	$ 2,329	63.29
2J Domestic Water Heater Replacement	$ 180,784	$ 697	259.39
3B CO2 Controls	$ 41,758	$ -	-
7A Permanent Load Reduction	$ -	$ -	-
8A Building Envelope Improvements	$ 263,397	$ 12,491	21.09
9A Cogeneration CHP	$ 132,433	$ 843	157.18
10A Sustainable Transportation - EV Chargers	$ 49,127	$ (943)	(52.07)
Totals:	$ 1,540,376	$ 28,153	54.71

Proposed Energy Related Capital Improvements			
Description	**Supporting ECM**	**Estimated Cost**	**Percentage of Total Project Cost (Not to exceed 15%)**
2B Add Cooling to Industrial Arts Building	2B	$ 171,667	7%
6A Design Allowance	6A	$ 75,000	3%
Totals:		$ 246,667	9%

Add additional lines as needed*

(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
MANASQUAN PUBLIC SCHOOL DISTRICT
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)	12,525	$70,935	1,894	$5,170
Electric Energy (KWH)	2,345,287	$293,090	1,236,648	$115,893
Natural Gas (therms)	101,076	$166,093	7,174	$9,112
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	1,092			
SO2	829			
CO2	894,439			

(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
MANASQUAN PUBLIC SCHOOL DISTRICT
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)	8,002	4,219	
Natural Gas (MMBTUs)	10,108	717	
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 V: Recommended Project—Project Cost Form For Base Case Project Forms

FORM V @15yr 4.00%

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ESCOs PROPOSED FINAL PROJECT COST FORM FOR BASE CASE PROJECT
MANASQUAN PUBLIC SCHOOL DISTRICT
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: **HONEYWELL INTERNATIONAL**

PROPOSED CONSTRUCTION FEES

Fee Category	Fees [1] Dollar ($) Value	Percentage of Hard Costs
Estimated Value of Hard Costs [2]:	$2,638,113	
Project Service Fees		
Investment Grade Energy Audit	$71,229	2.70%
Design Engineering Fees	$13,191	0.50%
Construction Management & Project Administration	$184,668	7.00%
System Commissioning	$13,191	0.50%
Equipment Initial Training Fees	$13,191	0.50%
ESCO Overhead	$184,668	7.00%
ESCO Profit	$79,143	3.00%
Project Service Fees Sub Total	$295,469	11.20%
TOTAL FINANCED PROJECT COSTS:	$3,197,393	21.20%
ESCO Termination Fee (To be paid only if the Board decides not to proceed beyond the ESP)	$0.00	0.00%

PROPOSED ANNUAL SERVICE FEES

First Year Annual Service Fees	Fees [1] Dollar ($) Value	Percentage of Hard Costs
SAVINGS GUARANTEE (OPTION)	$0.00	0.00%
Measurement and Verification (Associated w/ Savings Guarantee Option)	N/A	-
ENERGY STAR™ Services (optional)	Included	0.00%
Post Construction Services (If applicable)	N/A	-
Performance Monitoring	Included	-
On-going Training Services	N/A	-
Verification Reports	Included	-
TOTAL FIRST YEAR ANNUAL SERVICES	$0	Flat Fee

NOTES:
(1) Fees should include all mark-ups, overhead, and profit. Figures stated as a range will NOT be accepted.
(2) The total value of Hard Costs is defined in accordance with standard AIA definitions that include:

Labor Costs, Subcontractor Costs, Cost of Materials and Equipment, Temporary Facilities and Related Items, and Miscellaneous Costs such as Permits, Bonds Taxes, Insurance, Mark-ups, Overhead and Profit, etc.
*Annual Service only applies if customer accepts energy guarantee.

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
MANASQUAN PUBLIC SCHOOL DISTRICT
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: **15** (Years) (Months)
2. Construction Period [2] (months): **15**
3. Cash Flow Analysis Format:

Design and Engineering Fee: $ 158,287 **6%** of Hard Costs
Honeywell Project Cost: $ 3,197,393
Lease Issuance Fees: $ 25,000
Project Cost [1]: **$ 3,380,680** Interest Rate to Be Used for Proposal Purposes: **4.00%**

Year	Annual Energy Savings	Solar Savings	Annual Operational Savings	Energy Rebates/Incentives		Total Annual Savings	Annual Project Costs	Board Costs	Annual Service Costs [3]	Net Cash-Flow to Client	Cumulative Cash Flow
				Value	Utility						
Installation	$ 15,881			$ -		$ 15,881	$ -	$ -	$ -	$ 15,881	$ 15,881
1	$ 52,937	$ 77,237	$ 22,187	$ 77,559	JCPL/ SSB-VEEVR Grant	$ 229,920	$ (219,336)	$ (219,336)	$ -	$ 10,584	$ 26,465
2	$ 54,120	$ 78,936	$ 22,187	$ 1,806,600	SSB-VEEVR Grant	$ 1,961,844	$ (1,949,769)	$ (1,949,769)	$ -	$ 12,075	$ 38,540
3	$ 60,367	$ 80,673	$ 22,187	$ -		$ 163,227	$ (151,152)	$ (151,152)	$ -	$ 12,075	$ 50,615
4	$ 61,714	$ 82,447	$ 12,186	$ -		$ 156,348	$ (144,273)	$ (144,273)	$ -	$ 12,075	$ 62,690
5	$ 63,092	$ 84,261	$ 12,186	$ -		$ 159,539	$ (147,464)	$ (147,464)	$ -	$ 12,075	$ 74,765
6	$ 64,500	$ 86,115		$ -		$ 150,615	$ (138,540)	$ (138,540)	$ -	$ 12,075	$ 86,840
7	$ 65,939	$ 88,010		$ -		$ 153,949	$ (141,874)	$ (141,874)	$ -	$ 12,075	$ 98,915
8	$ 67,411	$ 89,946		$ -		$ 157,357	$ (145,282)	$ (145,282)	$ -	$ 12,075	$ 110,989
9	$ 68,916	$ 91,925		$ -		$ 160,840	$ (148,766)	$ (148,766)	$ -	$ 12,074	$ 123,063
10	$ 70,454	$ 93,947		$ -		$ 164,401	$ (152,326)	$ (152,326)	$ -	$ 12,075	$ 135,138
11	$ 72,026	$ 96,014		$ -		$ 168,040	$ (155,965)	$ (155,965)	$ -	$ 12,075	$ 147,213
12	$ 73,634	$ 98,126		$ -		$ 171,760	$ (159,685)	$ (159,685)	$ -	$ 12,075	$ 159,288
13	$ 75,278	$ 100,285		$ -		$ 175,562	$ (163,487)	$ (163,487)	$ -	$ 12,075	$ 171,363
14	$ 76,958	$ 102,491		$ -		$ 179,449	$ (167,374)	$ (167,374)	$ -	$ 12,075	$ 183,438
15	$ 78,676	$ 104,746		$ -		$ 183,422	$ (171,347)	$ (171,347)	$ -	$ 12,075	$ 195,513
Totals	**$ 1,021,903**	**$ 1,355,157**	**$ 90,933**	**$ 1,884,159**		**$ 4,352,153**	**$ (4,156,640)**	**$ (4,156,640)**	**$ -**	**$ 195,513**	**$ 195,513**

NOTES:
(1) Includes: Hard costs and project service fees defined in ESCO's PROPOSED "FORM V"
(2) No payments are made by MANASQUAN PUBLIC SCHOOL DISTRICT 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 7/1/21, Board approved utility EE programs replaced certain NJ CEP offerings. Subsequently, the BPU is requiring that all ESIP projects consult with the DCA and follow all DCA guidance regarding the procurement of all subcontractors. Additionally utility incentives must be detailed on ESIP for
(5) Lighting Savings associated with Elementary School Referendum Project realized in Year 3 through 15.

Annual Service only applies if customer accepts energy guarantee.

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 (Hard Costs Only)

Building & ECM	kWh Savings ($)	kW Savings ($)	Natural Gas Savings ($)	Annual Energy Cost Savings ($)	Annual Operational Savings ($)	Net Cost ($)	Simple Payback
Administrative Building	**$ 983**	**$ 101**	**$ (50)**	**$ 1,592**	**$ 558**	**$ 122,856**	**57.2**
1A LED Lighting Upgrades	$ 958	$ 94	$ (69)	$ 1,541	$ 558	$ 14,540	6.9
3A Building Management System Upgrades	$ 25	$ 7	$ 18	$ 51	$ -	$ 8,941	176.1
4A SSB-VEER Assessment and Verification	$ -	$ -	$ -	$ -	$ -	$ 98,242	-
6A Design Allowance	$ -	$ -	$ -	$ -	$ -	$ 1,133	-
Alternative School	**$ 292**	**$ 25**	**$ (14)**	**$ 597**	**$ 294**	**$ 14,010**	**15.7**
1A LED Lighting Upgrades	$ 251	$ 18	$ (18)	$ 544	$ 294	$ 2,801	3.3
3A Building Management System Upgrades	$ 41	$ 7	$ 4	$ 53	$ -	$ 10,219	193.9
6A Design Allowance	$ -	$ -	$ -	$ -	$ -	$ 990	-
Industrial Arts Building	**$ 1,277**	**$ 311**	**$ 1,415**	**$ 3,568**	**$ 565**	**$ 485,995**	**117.6**
1A LED Lighting Upgrades	$ 774	$ 189	$ (55)	$ 1,472	$ 565	$ 10,439	5.1
2A Boiler Replacements	$ -	$ -	$ 1,204	$ 1,204	$ -	$ 57,491	47.8
2B Add Cooling to Industrial Arts Building	$ 171	$ 56	$ (28)	$ 199	$ -	$ 171,667	861.2
2C Replace Univentilators in Industrial Arts Building	$ 286	$ 44	$ 256	$ 586	$ -	$ 198,076	337.7
3A Building Management System Upgrades	$ 46	$ 22	$ 38	$ 106	$ -	$ 46,622	441.4
6A Design Allowance	$ -	$ -	$ -	$ -	$ -	$ 1,699	-
Manasquan Elementary School	**$ 59,625**	**$ 6,938**	**$ 4,884**	**$ 87,019**	**$ 15,572**	**$ 1,791,985**	**17.5**
1A LED Lighting Upgrades	$ 10,659	$ 2,681	$ (767)	$ 18,144	$ 5,571	$ 204,908	8.6
2D Rooftop Unit Replacement	$ 8,588	$ 1,797	$ 2,814	$ 23,199	$ 10,001	$ 1,536,462	46.3
3A Building Management System Upgrades	$ 3,809	$ 2,460	$ 2,837	$ 9,107	$ -	$ -	-
5A Solar PPA	$ 36,569	$ -	$ -	$ 36,569	$ -	$ 13,357	0.4
6A Design Allowance	$ -	$ -	$ -	$ -	$ -	$ 37,258	-
Manasquan High School	**$ 53,245**	**$ 5,030**	**$ 2,895**	**$ 66,270**	**$ 5,100**	**$ 220,121**	**3.1**
1A LED Lighting Upgrades	$ 8,731	$ 2,188	$ (687)	$ 15,332	$ 5,100	$ 116,091	5.7
3A Building Management System Upgrades	$ 3,846	$ 2,841	$ 3,582	$ 10,270	$ -	$ 57,479	5.6
5A Solar PPA	$ 40,668	$ -	$ -	$ 40,668	$ -	$ 13,357	0.3
6A Design Allowance	$ -	$ -	$ -	$ -	$ -	$ 33,194	-
MHS Warehouse/Weightroom	**$ 470**	**$ -**	**$ (17)**	**$ 551**	**$ 98**	**$ 3,147**	**4.8**
1A LED Lighting Upgrades	$ 460	$ -	$ (30)	$ 528	$ 98	$ 2,421	3.9
3A Building Management System Upgrades	$ 10	$ -	$ 13	$ 23	$ -	$ -	-
6A Design Allowance	$ -	$ -	$ -	$ -	$ -	$ 726	-
Project Total	**$ 115,893**	**$ 12,405**	**$ 9,112**	**$ 159,597**	**$ 22,187**	**$ 2,638,113**	**14.5**

2. Utility and Other Rebates & Incentives

ENERGY STAR Portfolio Manager

Pay for Performance takes advantage of the ENERGY STAR Program with Portfolio Manager, EPA's interactive tool that allows facility managers to track and evaluate energy and water consumption across all their buildings. The tool provides the opportunity to load in the characteristics and energy usage of your buildings and determine an energy performance benchmark score. You can then assess energy management goals over time, identify strategic opportunities for savings, and receive EPA recognition for superior energy performance.

Incentives, Rebates and Grants Summary

Honeywell has a great deal of experience in applying for and successfully securing all available incentives, rebates, and grants for our clients. We have been approved and allocated for over $9M of incentives on behalf of our New Jersey customers alone since the introduction of the Energy Savings Improvement Program legislation in 2009. The New Jersey programs employed primarily included the Office of Clean Energy's Pay for Performance and Cogeneration Incentives. A table of the incentive amounts on a per project basis is provided below.

NJ Customers	Rebate Amount
Hudson County (Projected)	$2,369,012
East Brunswick Public Schools (Projected)	$1,601,318
West Orange Board of Education	$1,399,747
City of Newark	$1,242,368
Passaic County (Projected)	$1,209,061
Old Bridge Board of Education	$1,085,614
Bridgewater-Raritan Regional District	$963,034
Elizabeth Schools	$934,209
Parsippany-Troy Hills Board of Education	$831,175
Camden County Technical Schools	$734,803
West Orange Board of Education	$644,744
Hillsborough Board of Education	$584,736
NH-Voorhees Regional HS District	$511,558
School District of the Chathams	$419,056
West Morris Regional High School (Projected)	$392,700
Phillipsburg School District	$274,278
Educational Services Commission of NJ	$260,603
Somerset County Vocational	$246,095
Robbinsville Public School District	$231,015
Bloomfield Board of Education	$225,868
Mountain Lakes Board of Education	$194,722
Lower Cape May Regional	$190,658

NJ Customers	Rebate Amount
Verona School District	$171,015
Hanover Township School District	$169,882
City of Perth Amboy	$137,441
Town of Kearny	$84,147
Frankford School District	$30,743

Total Rebates and Incentives

	Lighting Incentives	HVAC Incentives	SSB-VEEVR Incentives	Total Incentive
Installation				
Year 1	$28,563	$18,600	$30,396	$77,559
Year 2			$1,806,600	$1,806,600
Year 3				
Year 4				
Total Incentives	**$28,563**	**$18,600**	**$1,836,996**	**$1,884,159**

3. 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.

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 Manasquan Public 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 Manasquan Public School 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 Manasquan Public School District. Typically, payment terms are structured so there is no up-front capital expense to the Manasquan Public School District and payments are aligned within your cash flow and fiscal limits.

Certificates of Participation (COPs)

Certificates of Participation (COPs) 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. COPs 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

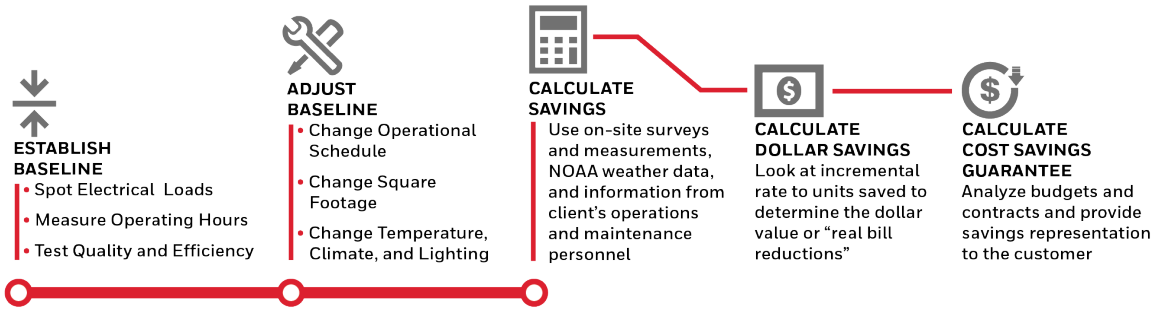
Section E – Measurement & Verification and Maintenance Plan

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. Because 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 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 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 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 an accurate and cost-effective method.

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. 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 Manasquan Public 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 Manasquan Public School District free to make future changes to the building or systems without affecting the savings agreement. It also necessitates fewer provisions for adjusting 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 contract start 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 there is an average value to savings. Honeywell looks at each incremental rate to units saved to properly determine the value (dollar) to the 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.

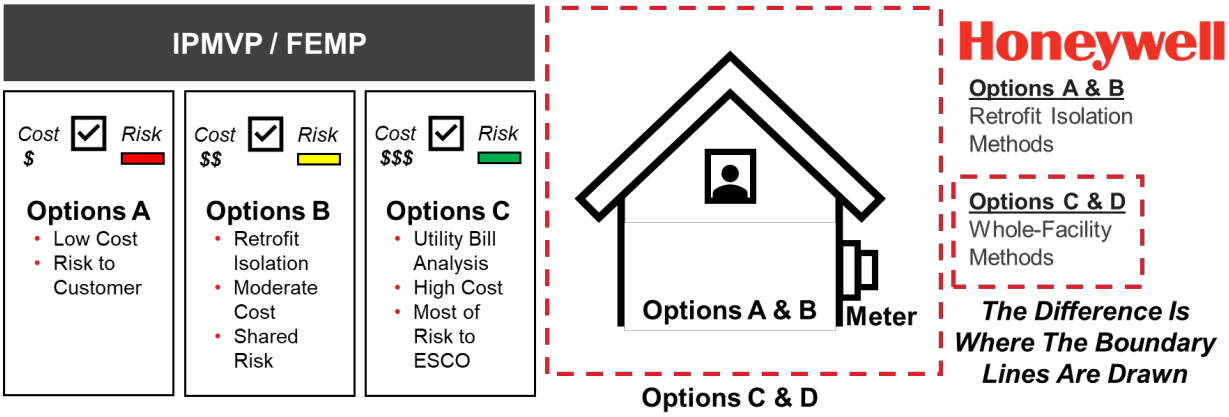
The O&M savings are typically a function of the District’s existing budgets (labor and direct costs), maintenance contracts, and operations (supplier) contracts. Honeywell has analyzed the information to provide a conservative savings representation for the District’s review and acceptance. The information 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 satisfaction that the improvements have been delivered and ongoing information regarding 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 Manasquan Public 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 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 Manasquan Public School District will continue to add or renovate buildings and that the District will desire 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 Manasquan Public 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 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 takes into account 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 and systems were installed, are performing to specification, and have the potential to generate the predicted savings
2. Determining/verifying 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 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 and systems that were installed are operating correctly and have the potential to generate the predicted savings. Verification methods may include surveys, inspections, and spot or short-term metering.

Regular Interval Post-Installation Verification

At least annually, Honeywell will verify that the installed equipment and 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 Manasquan Public School District.

Electricity and thermal savings from the ECMs in which no detailed long-term data is required to be collected will be stipulated and based on the starting dates, final completion dates, and verification of the ECMs' operation. For other ECMs in which 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	• 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 Lighting Controls	• Upgrade Lighting Control systems: – Install Occupancy Sensors – Install Lighting Controls	**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

ECM # and Name	Summary of ECM	M&V Methodology / Recommendation	Description of M&V – Pre- and Post-Process
1C De-Stratification Fans & 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
2A 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
2B Add Cooling to Industrial Arts Building	• Add Cooling with high efficiency DX 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
2C Replace Unit Ventilators in Industrial Arts Building	• Refurbish or replace antiquated Unit Ventilators.	**Option C:** • 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

ECM # and Name	Summary of ECM	M&V Methodology / Recommendation	Description of M&V – Pre- and Post-Process
2D Rooftop Unit Replacement	• Replace antiquated Roof Top Units with new high efficiency Rooftop 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 rooftop unit (EER) – verify the new equipment and controls are installed and commissioned as recommended by manufacturer
2E Kitchen Hood Controllers	• Install control devices on the Kitchen hoods to control exhaust air in response to the cooking load. Replace fan motors with new premium efficiency motors and VFD drives	**Option A** • Energy savings - Engineering calculations based on programmed parameters.	• 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
2F 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
2G Split System Replacements	• 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
2H Walk-In Compressor Controls	• Install control device on walk-in freezer and refrigerator evaporators to shut down the fan motor when the compressor is off on duty cycle	**Option A** • Stipulated Engineering calculations based on case studies for the Intellidyne control	• Pre-M&V: None • Post M&V: Savings stipulated based on engineering calculations for the term of contract
2I Burner Replacements and Controls	• Replace boiler burners and install advanced combustion controls on 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
2J Domestic Hot Water Heater Replacement	• Replace heater 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
3A Building Management System Upgrades	• Upgrade Building Management Systems to DDC and integrate all systems to a central platform	**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
3B CO2 Controls	• Install CO2 sensors to monitor room air quality.	N/A	• Pre-M&V: N/A • Post M&V: N/A
4A SSB-VEER Assessment and Verification	• Assessment and Verification for SSB-VEER grant qualification.	N/A	• Pre-M&V: N/A • Post M&V: N/A
5A Solar PPA	• Install Solar Power using Power Purchase Agreement	N/A	• Pre-M&V: N/A • Post M&V: N/A
6A Design Allowance	• Customer-controlled set-aside to address minor modifications during the project	N/A	• N/A
7A Permanent Load Reduction	• Rebates for Load Reduction (KW)	N/A	• N/A
8A 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	• Pre-M&V: Verify existing conditions • Post M&V: Visual inspection per scope of work
9A Cogeneration CHP	• Install Cogeneration 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 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
10A Sustainable Transportation - EV Chargers	• Install EV charging stations on select areas/buildings	**Option A** Engineering calculations based on nameplate and manufacturer supplied data	• Pre-M&V: Verify existing conditions • Post M&V: Visual inspection per scope of work

6. Recommended Preventive Maintenance Services

Per the NJ ESIP program, all services are required to be bid by the Manasquan Public School District for services as desired. Based on Honeywell's vast service organization, we are uniquely qualified to develop design specifications for 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 Manasquan Public School 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 Manasquan Public 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 to be 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 by checking 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, and 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 two (2) mid-season inspections are performed

Boilers

Services Performed

Preseason Inspection

1. Inspect fireside of boiler and record its 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 required repairs.

APPENDICES

Due to the voluminous page quantities, the following information has been provided electronically on a USB drive:

- **Appendix 1:** Local Government Energy Audits
- **Appendix 2:** ECM Calcs and Lighting
- **Appendix 3:** Manasquan Cut Sheets
- **Appendix 4:** Lighting LxL

Appendix 5: Non-Collusion Affidavit & Other Documents

EXHIBIT A:

NON-COLLUSION AFFIDAVIT

TO: **Manasquan Public School District**
DATE: June 23, 2022
FROM: Honeywell International Inc.
TELEPHONE: 609-553-1275
E-MAIL: wayne.leahy@honeywell.com
FACSIMILE: 732-477-6604

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: Wayne T Leahy
DATE: June 23, 2022
TYPE OR PRINT NAME: Wayne T. Leahy
TITLE: Senior Business Consultant
FEIN or TAX ID NUMBER: 22-2640650
ADDENDA ACKNOWLEDGED: N/A
DATE: June 23, 2022

NJ ESIP RFP Template: Public School Districts

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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

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

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE
N.J.S.A 10:5-31 *et seq*., N.J.A.C. 17:27
CONSTRUCTION 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, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be 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, gender identity or expression, disability, nationality or sex..

The contractor or subcontractor, where applicable, will send to each labor union or representative of workers will) 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.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Division may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Division is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Division , that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2.

The contractor or subcontractor agrees that, a good faith effort shall include compliance with the following procedures:

(A). If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 *et. seq*., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities to minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines or is so notified by the Division that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B). If good faith efforts to meet targeted employment goals have not or cannot be met for each construction grade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

1. To notify the public agency compliance officer, the Division, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;
2. To notify any minority and women workers who have been listed with it as awaiting available vacancies;
3. Prior to commencement of work, to request that the local construction trade union refer minority and , women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;
4. To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;
5. If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non-discrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

6. To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

    a. If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work: of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that die individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Division, [if necessary, the contractor or subcontractor shall hire *or* schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below,
    b. The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in paragraph (i) above, whenever vacancies occur. At the request of the Division, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.
    c. If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its tiles, and send a copy to the public agency compliance officer and to the Division.

7. To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Division and submitted promptly to the Division upon request.

(C). The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hail arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction total, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that,

in implementing the procedures of (B) above it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Division an initial project workforce report (Form A 201) provided to the public agency by the Division for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly project Workforce Report once a month thereafter for the duration of this contract to the Division and public agency compliance officer

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women.

(D). The contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts Equal Employment Opportunity Compliance 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 Public Contracts Equal Employment Opportunity Compliance for conducting a compliance investigation pursuant to Subchapter 10 of New Jersey Administrative Code at N.J.A.C. 17:27.

Honeywell International Inc. acknowledges the Mandatory Equal Opportunity Language Requirements.

Wayne T. Leahy
Senior Business Consultant

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

DPMC

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	04/01/2021	03/31/2023
	C098 -ENERGY MANAGEMENT SYSTEMS	04/01/2021	
	C036 -ENERGY SERVICES/ESCO	04/01/2021	
	C049 -FIRE ALARM/SIGNAL SYSTEMS	04/01/2021	
	license #: P00968		
	C032 -HVACR	04/01/2021	
	license #: 19HC00404900		
	C050 -SECURITY/INTRUSION ALARMS	04/01/2021	

Thank you and we look forward to working with you in the future.