

**EXHIBIT 3**  
**Measurement and Verification Plan**

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**CM#1 Generator – Load Shedding**

**General Description and MV-Option Definition and Rationale:**

The objective of this measure is to reduce demand charges by utilizing existing diesel emergency generators to load shed on event calls from Florida Power and Light. The following will be addressed with this measure:

- Generate demand charge savings by utilizing existing generators to fully power the building on a call from FP&L.
- Installing electrical wiring from new FP&L controller to generator.
- Renegotiate a demand load shedding rate/incentive structure with FP&L.

**Conclusions and Recommendations:**

Honeywell is recommending that the existing generators for the Police Headquarters Building, Civic Center and Prineville Lime Plant be utilized to shift onto FP&L's load curtailment rider rate credit.

CMs Description	IPMVP M&V Option	Electric Savings Verification Method	Fuel Savings Verification Method	Water/Sewer Savings Verification Method
Generator Load Shedding	Option A	A	N/A	N/A
Generator Load Shedding	Option A	A	N/A	N/A

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the kW cost savings. A one-time inspection of the newly installed system will be conducted in year one (1). Cost avoidance will be calculated one time during year one (1) and deemed satisfied during the following years through the use of Option A. The energy performance baseline was determined from existing systems manufacturer's performance specifications, customer interviews, and utility bill analysis. The energy use baseline criteria are included herein. The baseline unit cost of energy is based on the base year rates paid by the Customer and will be considered to be the value of unit cost avoidance.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

**Baseline:** The energy performance baseline was determined from existing systems manufacturer's performance specifications, customer interviews, and utility bill analysis. The energy use baseline criteria are included herein. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented herein. Under Option A services, Honeywell will confirm that the improvements have been installed to project and manufacturers specifications, and that the quantity and operation of the improvements align with project specifications. The value of energy and cost avoidance is agreed upon based on engineering calculations and customer acceptance as shown in the following tables:

FP&L Acct #	Building	Honeywell Site #	Current 12 mon kWh (Nov 2010 to Oct 2011)	Previous 12 mon kWh (Nov 2009 to Oct 2010)	Current 12 mon kW (Nov 2010 to Oct 2011)	Previous 12 mon kW (Nov 2009 to Oct 2010)
3890326600	Police Dept., Bldg C	1	2,045,820	1,988,280	279	277
1954271407	Civic Center	53	2,363,040	2,461,440	514	548

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The savings are based on a utility rate and operational changes. The verification of potential-to-save will be based on completion of the following: Switching to FP&L's load curtailment rate and performing load curtailment as required. The annual savings potential will be agreed upon as the amounts presented herein. Verification will be performed during year one (1) only. The realized cost avoidance for this measure as determined in Engineering Calculations will not be adjusted for variations in consumption or loss of credits in the rates.

**4. Parameters to be Monitored & Sampling Plan**

General: The measured parameter is limited to utility bills. Notification of performance status will be provided to the customer on an annual basis. All other operating parameters including estimated savings projections are agreed upon.

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
Generator – Load Shedding	A	kW	none	Baseline utility bills		
Generator – Load Shedding	A	Operational		Used for emergencies only	Used for demand reduction	

Installation & Acceptance Period: The sampling methodology will utilize measurements from analysis of operating history and utility bill data summarized below.

Performance Period (On-Going): There will be no recalculation of savings. An annual walk-through and customer information will confirm general operation to contract specifications and constitutes the on-going measurement. The on-going measurement will be limited to inspection of equipment and service records during routine site visits by Honeywell M&V personnel and reporting of utility rate consumption impacts using historic rates compared to rates achieved under this CM during year one (1) only.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through changing FPL rate.

**6. Determination of Non-Energy Operational Cost Impact**

No operational savings are included in this contract.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Maintain post retrofit status of building components relative to this CM (i.e., equipment repair and maintenance, ability to start up and operate during peak periods, perform due diligence to prevent failure in the customer's transfer switch, 12V pager switch or the failure in the starting of the generator, etc.).
- Responsibilities as delineated herein.
- Generator maintenance as identified in the following table.
- Appropriate adherence to Proposed Sequence of Operations or alternate equivalent Sequences of Operation.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the performance specifications presented herein. Honeywell will inspect and analyze collected data to confirm that the capacity to perform has been achieved. Honeywell will confirm through contractor records that the quantity and capacity of the proposed equipment has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Honeywell will review rate structure and generator test report and run time logs sheets to confirm that the CM is still in place

**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

**CM 2: Building Lighting Retrofit**

**1. General Description & MV-Option Definition and Rationale:**

Purpose of CM is to increase the efficiency of the cities lighting systems. This is accomplished by replacing selected existing lighting fixtures with new energy efficient lighting systems. Retrofitting existing lighting to the most current technologies available will provide significant reductions in both the electrical demand and consumption at the facility.

Capacities and performance indices of the Lighting Retrofit CM are presented below in this M&V plan, Exhibit 2. Lighting Details, and Savings Calculations attached hereto and incorporated herein.

**2. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the lighting system retrofit. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected as a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit* and not the building as a whole at the utility meter. This retrofit isolation approach thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the lighting systems installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer and by annual spot check of sample populations of systems. Other equipment & processes will not be monitored. Electrical energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired, can be provided at extra cost.

**3. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined from existing systems manufacturer’s performance specifications, Staff interviews, and utility bill analysis. The energy use baselines are included in Exhibit 2. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in exhibit 2.

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated and agreed upon operational and energy baseline parameters.

**4. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following:

- Measurement and verification for this CM will be accomplished with Pre and Post installation measurements of the power draw for a representative sample of each type of retrofit.
- The annual operating hours for each fixture will be stipulated to the hours presented in the lighting line by line.
- Annual Cost Avoidance to be updated with current utility unit costs.

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
Lighting Retrofit	A	Energy	Fixture amperage Sample Pre and Post measurements	One-time measurement 5% of fixtures that comprise 80% of the kW reduction	One-time measurement 5% of fixtures that comprise 80% of the kW reduction at end of installation period will be done by the lighting sub-contractor.	Annual walk-through and visual inspection. No annual measurement will be done.
	A	Operational	Annual operating hours & times	Agreed upon based on interview data	Agreed upon to be same as baseline	Stipulated with annual review and walk-through

**5. Parameters to be Monitored & Sampling Plan**

General: Critical performance and operational parameters will be measured. Critical parameters are limited to fixture amperage. All other parameters are considered operational parameters including, but not limited to operating hours, weather, etc.

Proposal Period: Critical performance and operational parameters monitored were limited to fixture amperage.

Pre-Installation & Baseline Verification:

- Review & comment on the Contract between Customer and Honeywell regarding capacities and performance indices of the system.
- Baseline adjustments made based on review findings that are outside of the target performance indices.
- No other baseline verification activities are planned.

Installation & Acceptance Period: The sampling methodology will utilize measurements taken on switches or breakers. These measurements include 5% of fixtures per technology type (lamp and ballast combinations) that comprise 80% of the lighting Conservation Measures (CM) kW reduction. Due to minimal quantities and accepted

energy usage, exit signs, and incandescent lamps will not be measured. Operational parameters (hours) will be stipulated in order to calculate savings (Exhibit-2).

Performance Period (On-Going): No Amperage measurements will be taken. An annual walk-through and visual inspection will be conducted on a sample of the facilities to ensure persistence of the CM savings. Over the course of a year, all buildings with lighting upgrades are intended to be inspected to make sure that the CM remains in place

#### **6. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the lighting fixture efficiency.

The determination of Cost Avoidance will utilize:

- Measurements of representative fixture amperage.
- Lighting Cost Avoidance calculations included in Exhibit 2

The monitoring and sampling plan results will be inserted into the calculations in Exhibit G4 – Savings Calculations to determine realized energy avoidance. In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

#### **7. Determination of Non-Energy O&M Cost Impact**

Invoice and Internal Work Order records provided by the city were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of historical Lighting Retrofit related invoice service activities in the Honeywell Service Agreement, reductions in lighting related labor activities required to maintain ageing equipment, and reduction in lighting related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

- The operational cost savings are deemed satisfied upon contract execution.
- The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings.
- The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

#### **8. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Provide current status of the building (i.e., occupancy level and use, hours of operation, etc.).
- Provide copies of utility bills affected by CM.
- Responsibilities as delineated in Schedule C and in Schedule J.
- Provide all maintenance records and purchase invoices pertaining to this measure.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the cost avoidance presented in the Schedule of Savings in Schedule C, normalized to baseline conditions as described by the methods outlined in the Scope of Work, Schedule C, and Exhibits to Schedule C and this M&V plan.

#### **9. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual verification as defined above.

#### **10. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

## CM#3 - Sports Lighting & Control Retrofit Option A (Electric)

### General Description & MV-Option Definition and Rationale:

The purpose of this CM is to increase the efficiency of the sports lighting & controls at various parks throughout the city. This will be accomplished by replacing selected existing sport lighting fixtures with new energy efficient lighting systems and controls. Retrofitting existing lighting and control systems to the most current technologies available will provide significant reductions in both the electrical demand and consumption at the facility.

Capacities and performance indices of the Lighting Retrofit CM are presented below in this M&V plan, Exhibit 2, *Lighting Details, and Engineered Cost Avoidance Calculations*, attached hereto and incorporated herein.

### 1. Boundary of Energy Use and Cost Avoidance Determination:

The energy cost avoidance determination for this CM is isolated to the sports lighting system retrofit. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the lighting & control retrofits at various parks throughout the city. This is a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit*. This retrofit isolation approach thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the lighting & control systems installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer.

### 2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions

Baseline: The energy performance baseline was determined from existing systems manufacturer's performance specifications. The energy use baselines are included in exhibit 2. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H and I.

### Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated to and agreed upon operational and energy baseline parameters.

### 3. Potential-to-Save Verification Plan

The verification of potential-to-save will be based on completion of the following:  
Measurement and verification for this CM will be accomplished with Pre and Post installation measurements of the power draw for a representative sample of each type of fixture. The annual operating hours for each fixture will be stipulated to the hours presented in Schedules F and I.

### 4. Parameters to be Monitored & Sampling Plan

General: The measured parameter is limited to fixture amperage for a sample population of fixtures. Fixture quantity and types will be confirmed through contractor documentation. All other operating parameters including run time hours are stipulated and agreed upon.

Installation & Acceptance Period: The sampling methodology will utilize measurements taken on switches or breakers. These measurements include 5% of fixtures per technology type (lamp and ballast combinations) that comprise 80% of the lighting Conservation Measures (CM) kW reduction. Due to minimal quantities and accepted energy usage, exit signs, and incandescent lamps will not be measured. Operational parameters (hours) will be stipulated in order to calculate savings.

Performance Period (On-Going): There will be no on-going measurements of fixture amperage for Option A facilities. The on-going measurement will be limited to review of lamp and ballast failure conditions as presented by customer representatives during routine site visits by Honeywell M&V personnel.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the lighting fixture efficiency.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit fixture kW \* hours \* unit cost  
Minus

Post retrofit fixture kW\* hours\* unit cost.

The monitoring and sampling plan results will confirm fixture amperage by fixture type. Utility unit costs will be evaluated based on utility rate analysis. All other operating parameters (including hours) used in avoidance calculations are agreed upon and stipulated for the duration of the performance period.

**6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by the City were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in lighting related labor activities required to maintain ageing equipment, and reduction in lighting related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will measure to confirm that the capacity to perform (fixture kW, etc.) has been achieved. Honeywell will confirm through contractor records that the quantity of retrofit fixtures proposed has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual verification as defined above.

**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

## CM#4 Vending Machine Controls Retrofit

### General Description & MV-Option Definition and Rationale:

The purpose of this CM is to increase the efficiency of the vending machine systems throughout the city by installing occupancy type controls on the vending machine systems. Retrofitting existing vending machines to the most current technologies available will provide significant reductions in both the electrical demand and consumption at the facility.

Capacities and performance indices of the vending machine controls Retrofit CM are presented below in this M&V plan, and in Schedule F, attached hereto and incorporated herein.

#### **1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the vendmiser retrofit. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the vendmiser. This is a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit* and not the building as a whole at the utility meter. This retrofit isolation approach thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the vendmiser installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer.

#### **2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined from existing systems manufacturer's performance specifications. The energy use baselines are included in Schedules F, H and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H and I.

#### Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated to and agreed upon operational and energy baseline parameters.

#### **3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following:  
Measurement and verification for this CM will be accomplished with manufacturer's performance specifications. The annual operating hours for each fixture will be agreed upon to be the hours presented in Schedules F and I.

#### **4. Parameters to be Monitored & Sampling Plan**

General: The vendmiser parameters are based on the manufacturer's specifications. The savings will be based on energy calculations included herein. All other operating parameters including run time hours are agreed upon.

Performance Period (On-Going): There will be no on-going measurements of vendmiser for Option A facilities. The on-going measurement will be limited to review of vendmiser operation as presented by customer representatives during routine site visits by Honeywell M&V personnel.

#### **5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the vendmiser operation efficiency.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit fixture kW \* hours \* unit cost  
Minus

Post retrofit fixture kW\* hours\* unit cost.

The monitoring and sampling plan results will confirm vendmiser operation. Utility unit costs will be evaluated based on utility rate analysis. All other operating parameters (including hours) used in avoidance calculations are agreed upon for the duration of the performance period.

**6. Determination of Non-Energy Operational Cost Impact**

There are no associated avoided Operational Costs from this CM

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated in Schedules C, F, I, J and K referenced and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will confirm through contractor records that the quantity of vendmisers proposed has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are stipulated and agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual verification as defined above.

**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

**CM#5: Water Upgrades**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to reduce water consumption and sewer service used in the city buildings. Equipment such as water faucets, toilets, urinals and showers will be retrofit with reduced water flow equipment.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to water consumption and sewer services. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the Water Upgrades CM as a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit* and not the building as a whole at the utility meter. This retrofit isolation approach thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the water utility meter that are not related to this CM. Honeywell will provide verification that the plumbing fixtures installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer and by spot check of sample populations of systems.

Other equipment & processes will not be monitored.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined using engineering calculations based on fixture specifications, fixture quantities, estimated occupancy and usage, and was compared to the utility bill for verification. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

### **3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the quantity, type, and model of Water Upgrades devices have been installed.

### **4. Parameters to be Monitored & Sampling Plan**

General: The measured parameter is limited to verification of fixture quantity and types through contractor documentation. All other operating parameters including occupancy are stipulated and agreed upon.

Installation & Acceptance Period: The installation documents will be reviewed to confirm that quantity and type of fixtures have been installed. M&V activities will confirm the general operation of the CM to contract specifications.

Write up in post installation report.

Performance Period (On-Going): There will be no on-going measurements, annual walk-through and customer information will confirm general operation and maintenance to contract specifications. All other parameters are agreed upon for the duration for the contract.

### **5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure are achieved through reductions in water consumption and reductions in sewer charges based on reduced volume of waste water flowing to the sewer.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit Gallons \* unit cost  
Minus

Post retrofit Gallons \* unit cost.

The monitoring and sampling plan results will indicate energy and cost avoidance.

### **6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by city were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in related labor activities required to maintain ageing equipment, and reduction in related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

### **7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.

- Responsibilities as delineated in Schedules C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will measure to confirm that the capacity to perform has been achieved. Honeywell will confirm through contractor records that the quantity of retrofit fixtures proposed has been installed. Honeywell and customer agree that the on-going performance and operation (use per day, maintenance, etc.) are agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual verification as indicated based on annual walk through and visual inspection.

9. Reports and Documentation: There will be a single (1) annual report of the determination of energy avoidance each year

**CM#6 - Building Envelope Improvements**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to reduce the loss of energy through air infiltration or leakage around doors, windows, wall penetrations or poor or missing insulating materials that cause loss of conditioned air, or introduction of unconditioned air to conditioned spaces. The loss of conditioned air or introduction of unconditioned air increases the heating load on the heating systems and increases in cooling loads on Air Conditioning systems.

- Includes installation of weather stripping and caulking
- Includes Window Replacements
- Includes Roof Replacement

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is dependent on the reduced loss of energy through air infiltration or leakage around doors, windows, roofs, wall penetrations or poor or missing insulating materials that cause loss of conditioned air, or introduction of unconditioned air to conditioned spaces. Multiple methodologies were selected to determine the energy and cost avoidance as cost effective approaches providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. Measured and stipulated parameters will be used on the application and energy impact.

**2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The energy performance baseline was determined from observance and engineering calculations. The energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in section Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedule F, H, and I.

Under *Option A* services, Honeywell will confirm that the improvements have been installed to project and manufacturers specifications, and that the quantity of improvement activities aligns with project specifications. The value of energy and cost avoidance is stipulated and agreed upon based on engineering calculations and customer acceptance.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the building envelope retrofits have been installed within contract specifications. Verification documentation will include, but not be limited to, contractor start up documentation, and review of name plate and manufacturer specifications data.

#### **4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on review of installation documents, to verify that the quantity and type of building envelope retrofits have been installed within contract specifications. Annual visual inspection will be the only verification activity provided, avoided energy and costs will be agreed upon based on customer acceptance.

#### **5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure is achieved through reductions in energy consumption.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

$$\begin{array}{r} \text{Pre retrofit energy consumption * unit cost} \\ \text{Minus} \\ \text{Post retrofit energy consumption* unit cost.} \end{array}$$

The monitoring and sampling plan results will indicate energy and cost avoidance.

#### **6. Determination of Non-Energy Operational Cost Impact**

There are no associated avoided Operational Costs from this CM.

#### **7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option A buildings will quantify energy and cost avoidance as stipulated and agreed upon based on year 1 verification activities plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the heating energy baseline.

#### **8. Performance Period Definition and On-Going Activities**

Performance Period Definition: FOR THIS CM ONLY The performance period term overall is 10 years.

On-Going Activities: Annual measurement and verification as indicated.

#### **9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

### **CM#7 Municipal Complex Campus High Efficiency Chiller Plant**

#### **General Description & MV-Option Definition and Rationale:**

This option would consist of a campus chilled water plant utilizing (2) 250 ton high efficiency water cooled chillers and cooling towers centrally located at the current Building B air cooled chiller pad. New underground chilled water piping would be routed from the central campus to Buildings A and C. The existing building pumps would be utilized as secondary pumps. The older and inefficient chillers at Buildings A and C would be removed. The newer chiller at building C would remain as backup. The two existing air cooled chillers for Building B would be removed

and be able to be stored and rigged back in the event of an emergency. Emergency taps would be provided at each building.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the chillers. All other existing or new equipment directly using are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building and process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. This program will not monitor performance period changes in chilled water load, new equipment capacity, or set-point/differential control values from baseline load, baseline chiller capacity, and baseline control values and thus the cost avoidance analysis will be normalized to baseline conditions. Honeywell will provide verification that the new chillers are installed and operating to the specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for each year of the Guarantee Period.

Other equipment and processes will not be monitored. Electrical energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined by computer model. The energy use baselines are included in the exhibits.

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have agreed upon general performance, operational, and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following;

- The Customer’s sign-off of the Delivery & Acceptance certificate.
- Verification of manufacturer’s submittal specifications compared to the calculations.
- Verification of factory start up reports compared to the calculations.
- Potential-to-save verification will be determined based on Chiller efficiency improvements.

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
Chillers	Option B	Operational Performance	Manufacturer’s submittal, datasheets (kw/ton), Chiller Efficiency (kw/ton), Installation documents	Existing Chiller Efficiency	Operational hours used in model	Year 1
Chiller and Cooling Tower Replacement	Option B	Energy Savings	1. kW per Ton, 2. % load 3. Total Tons	Baseline Energy Consumption Data as simulated in computer model	Efficiency of the new chillers to be based on the table below	.Years 1

Performance Points rated at AHRI Condenser Relief:													
Point #	%Load Request	Capacity (ton)	Input Power (kW)	Performance (kW/ton)	Operating RLA (A)	Evaporator				Condenser			
						Flow (gpm)	EWT (°F)	LWT (°F)	PD (ftH2O)	Flow (gpm)	EWT (°F)	LWT (°F)	PD (ftH2O)
1	100.0	270.0	160.1	0.593	230	648.1	55.0	45.0	21.4	810.0	85.0	94.3	16.4
2	75.0	202.5	82.8	0.409	120	648.1	52.5	45.0	21.5	810.0	75.0	81.7	17.0
3	50.0	135.0	36.1	0.268	58	648.1	50.0	45.0	21.6	810.0	65.0	69.3	17.8
4	25.0	67.5	17.4	0.258	29	648.1	47.5	45.0	21.6	810.0	65.0	67.1	17.8

#### 4. Parameters to be Monitored & Sampling Plan

##### Monitored Parameters

The following data will be monitored/calculated after construction of the building is complete:

Cooling load (tons) produced by the chillers.

Electricity consumption of the new chiller.

##### Data Collection Plan

The electricity consumption (kWh) and demand (kW) of the chillers will be collected for a period of one year after the installation.

The following points will be monitored for the new chillers.

<u>Point</u>	<u>Engineering Units</u>	<u>Interval</u>
Chiller Command	On/Off	15 min.
Chiller Power	kW	15 min
Chiller Tons	Tons	15 min.
% load	%	15 min.

##### Savings Analysis Method

The savings for will be calculated from the following equation:

$$kWh_{savings} = kWh_{meter} \times \left\{ \left[ \frac{kW/ton_{base}}{kW/ton_{new}} \right]_{rated} - 1 \right\} \times \left( \frac{CDD(65)_{TMY}}{CDD(65)_{meter}} \right)$$

$$kW_{savings} = kW_{post} \times \left\{ \left[ \frac{kW/ton_{base}}{kW/ton_{new}} \right]_{rated} - 1 \right\} \times \left( \frac{CDD(65)_{TMY}}{CDD(65)_{meter}} \right)$$

Proposal Period: No data logging or spot measurements were conducted.

Pre-Installation & Baseline Verification: No data logging or spot measurements will be conducted.

Installation & Acceptance Period: Installation documents used to verify operating parameters of chiller to match projected and manufacturer specifications. Chiller efficiency values to be used to calculate energy savings. Baseline efficiency and baseline energy consumption to be compared to post retrofit efficiency times baseline energy consumption.

Performance Period (On-Going): Data logging will be accomplished by trending the points listed above. Walk-through on an annual basis will be conducted to observe general conditions of operation and perception of mechanical conditions.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the chiller efficiency. Because Honeywell will not be controlling the plant operation, the savings will be deemed satisfied if the chillers meet or exceed the four efficiency points noted below at the stated conditions listed in section 3 above.

<b>% Load</b>	<b>Kw/Ton</b>
100%	.593
75%	.409
50%	.268
25%	.258

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

**6. Determination of Non-Energy O&M Cost Impact**

Invoice and Internal Work Order records provided by Customer were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of historical chiller or cooling tower system related invoice service activities in the Honeywell Service Agreement, reductions in chiller and cooling tower system related labor activities required to maintain ageing equipment, and reduction in chiller and cooling tower system related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Provision of chiller false loading if necessary for testing.
- By execution of this contract, Customer deems the chiller run times as stipulated and agreed-to.
- By execution of this contract, Customer acknowledges they have reviewed the energy savings calculation, presented in the Exhibits, and agree that they are appropriate for determination of energy avoidance.
- By execution of this contract, Customer represents that they understand that their total electric consumption may increase even with the savings at the chiller if the plant is run for additional hours then the base year.
- Performance of responsibilities outlined in Schedules C, F, I, J and K.
- Annual (minimum) chiller maintenance.

By execution of this contract, Customer deems the savings value and the methodology and the results as agreed-to.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the cost avoidance presented in Section 1 of exhibit 3, normalized to baseline conditions as described by the methods outlined in the M&V plan.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-going Activities:

No on-going M&V.

**9. Reports & Documentation**

Same as CM#1.

**CM#8 - Chilled Water Pumping Optimization**

**General Description & MV-Option Definition and Rationale:**

Purpose of CM is to increase the efficiency of the chilled water pumping system. This is accomplished by replacing the old 2 way valves with new 2 way valves and installing new motor VFD's and pump motors.

Capacities and performance indices of the chilled water system are presented below in this M&V plan and in the CM Savings Calculations attached hereto and incorporated herein.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the chilled water systems of the City Hall buildings A,B, C and Civic Center. All other existing or new equipment directly using are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building & process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. Honeywell will provide verification that the chilled water systems are operating to the specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for each year of the Guarantee Period.

Other equipment & processes will not be monitored. Electrical energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined using computer model. The energy use baselines are included in Exhibit 2. The baseline unit cost of energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance as stipulated below. Operational performance baseline parameters are included and presented in Exhibit 2.

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following;

- The Customer's sign-off of the Delivery & Acceptance certificate
- Verification of manufacturer's submittal specifications compared to the calculations
- Verification of factory start up reports compared to the calculations
- Potential-to-save verification will be determined based on Chiller efficiency improvements.

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
Chiller Water Pumping	Option B	Operational Performance	Manufacturer's submittal, datasheets and Installation documents	3 way valves and constant volume pumping	2 way valves and VFD on new pump motors	Annual reporting
Chilled water pumping	Option B	Energy Savings	Improved Efficiency indicates reduced energy consumption	Baseline Energy Consumption Data from computer model	Baseline Energy Consumption minus Energy Consumption @ Post Retrofit consumption	Year 1 through Year 15.

**4. Parameters to be Monitored & Sampling Plan**

General: Operating parameters are limited to change in chiller efficiency. Energy Calculation summary is presented in Exhibit G2-3.

Proposal Period: No data logging or spot measurements were conducted.

Pre-Installation & Baseline Verification: No data logging or spot measurements will be conducted.

Installation & Acceptance Period: Installation documents used to verify operating parameters of chiller to match projected and manufacturer specifications. Chiller efficiency values to be used to calculate energy savings. Baseline efficiency and baseline energy consumption to be compared to post retrofit efficiency times baseline energy consumption.

Performance Period (On-Going): Data logging or spot measurements will be conducted to verify operation within the projected performance parameters. A walk-through on an annual basis to observe general conditions of operation and perception of mechanical conditions will also be made.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the chiller efficiency. Cost savings is energy unit savings times cost of energy per unit.

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

**6. Determination of Non-Energy O&M Cost Impact**

Invoice and Internal Work Order records provided by Customer were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of historical chiller or cooling tower system related invoice service activities in the Honeywell Service Agreement, reductions in chiller and cooling tower system related labor activities required to maintain ageing equipment, and reduction in chiller and cooling tower system related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- By execution of this contract, Customer deems the chilled water system load as stipulated and agreed-to.
- By execution of this contract, Customer acknowledges they have reviewed the energy savings calculation and agree that they are appropriate for determination of energy avoidance. By execution of this contract, Customer represents that they understand that their total electric consumption may increase even with the savings at the chilled water system if the operated hours are increased over based year hours.
- Performance of responsibilities outlined herein.
- Annual (minimum) chiller water system maintenance.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the cost avoidance presented herein.

- **Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-going Activities:

No on-going M&V.

**9. Reports & Documentation**

Same as CM#1.

**CM#9 - Mechanical Retrofit Package DX Systems**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to improve energy efficiency in various mechanical systems; systems impacted are indicated in detail in Schedule A. Energy avoidance will be measured through the use of Option A.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

Option A was selected to determine the energy and cost avoidance for the Packaged DX Systems as a cost effective approach providing an acceptable balance between the cost of doing Measurement and Verification (M&V) versus the quantity of projected Cost Avoidance. This method analyzes energy use within the building based on standard engineering practices and principals. This approach does not require the time and expense necessary to track on-site changes that effect electric and gas energy consumption as seen at the utility meters. Potential to perform is verified by review of installation documentation and observed conditions, in that all improvements have been completed to project specifications.

**2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The energy performance baseline was determined from observance and engineering calculations. The energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

Under *Option A* services, Honeywell will confirm that the improvements have been installed to project and manufacturers specifications, and that the quantity of improvement activities aligns with project specifications. The value of energy and cost avoidance is agreed upon based on engineering calculations and customer acceptance.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the mechanical retrofit systems have been installed within contract specifications. Verification documentation will include, but not be limited to, contractor start up documentation, combustion analysis, and review of name plate and manufacturer specifications data.

#### **4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on review of installation documents to verify that the quantity and type of mechanical retrofits have been installed within contract specifications. On-going measurement will be provided to confirm operation and maintenance to project specifications, avoided energy and costs will be determined based on data collected. Site walk-through will be conducted to confirm that the CM is still in place and functioning as intended based on the observations indicated;

- Verify through visual observation that the CM is still installed and has been properly maintained.
- Verify to the limits of visual observation that the CM is still functional to specifications of project.
- Review current manual set points and manual settings. Record changes in the operation, control sequences and control set points of the CM's from original installed conditions.
- Review observations about the current status of the building (i.e. occupancy, use), compare to Customer records, and compare against the contractual baseline and required post-retrofit operating conditions.
- Record observed addition or deletion of site equipment, which may impact the CM's or the building energy consumption and compare to Customer records.
- Record observations regarding other changes on-site that may impact the CM's or the building energy consumption.

#### **5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure is achieved through reductions in electric consumption.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit energy unit cost  
Minus

Post retrofit energy unit cost.

The monitoring and sampling plan results will indicate energy and cost avoidance.

#### **6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by the city were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in related labor activities required to maintain ageing equipment, and reduction in related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts;

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

#### **7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc).
- Responsibilities as delineated in Schedules C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein.. Option A buildings will quantify energy and cost avoidance as stipulated and agreed upon based on year 1 verification activities plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

#### **8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

#### **9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

### **CM#10 – Dedicated AC for City Hall MIS Server Room**

#### **General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to install a dedicated A/C system for City Hall MIS server room. Energy avoidance will be measured through the use of Option A.

#### **1. Boundary of Energy Use and Cost Avoidance Determination:**

Option A, was selected to determine the energy and cost avoidance for the Packaged DX Systems. As a cost effective approach providing an acceptable balance between the cost of doing Measurement and Verification (M&V) versus the quantity of projected Cost Avoidance. This method analyzes energy use within the building based on standard engineering practices and principals. This approach does not require the time and expense necessary to track on-site changes that effect electric and gas energy consumption as seen at the utility meters. Potential to perform is verified by review of installation documentation and observed conditions, in that all improvements have been completed to project specifications.

#### **2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The energy performance baseline was determined from observance and engineering calculations. The energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H and I.

Under *Option A* services, Honeywell will confirm that the improvements have been installed to project and manufacturers specifications, and that the quantity of improvement activities aligns with project specifications. The value of energy and cost avoidance is stipulated and agreed upon based on engineering calculations and customer acceptance.

#### **3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the mechanical retrofit systems have been installed within contract specifications. Verification documentation will include, but not be limited to, contractor start up documentation, combustion analysis, and review of name plate and manufacturer specifications data.

#### **4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on review of installation documents, to verify that the quantity and type of mechanical retrofits have been installed within contract specifications. No on-going measurement will be provided, avoided energy and costs will be stipulated and agreed upon based on customer acceptance. Site walk-through will be conducted to confirm that the CM is still in place and functioning as intended based on the observations indicated;

- Verify through visual observation that the CM is still installed and has been properly maintained.
- Verify to the limits of visual observation that the CM is still functional to specifications of project.

- Review current manual set points and manual settings. Record changes in the operation, control sequences and control set points of the CM's from original installed conditions.
- Review observations about the current status of the building (i.e. occupancy, use), compare to Customer records, and compare against the contractual baseline and required post-retrofit operating conditions.
- Record observed addition or deletion of site equipment, which may impact the CM's or the building energy consumption and compare to Customer records.
- Record observations regarding other changes on-site that may impact the CM's or the building energy consumption.

**5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure is achieved through reductions in electric consumption.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit energy unit cost  
Minus

Post retrofit energy unit cost.

The monitoring and sampling plan results will indicate energy and cost avoidance.

**6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by the city were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in related labor activities required to maintain ageing equipment, and reduction in related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts;

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option A buildings will quantify energy and cost avoidance as stipulated and agreed upon based on year 1 verification activities plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

**.CM 12 VAV Kitchen Hood Systems Retrofit/Optimization**

**General Description & MV-Option Definition and Rationale:**

- Purpose of CM is to increase the efficiency of the existing kitchen exhaust systems, equipment and controls. This is accomplished by installing new VFD's.

Capacities and performance indices of the modified systems are presented below in this M&V plan and in the CM Savings Calculations attached hereto and incorporated herein as Exhibit 2.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the retrofitted kitchen exhaust use. All other existing or new equipment directly using are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building & process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. This program will not monitor performance period changes in exhaust system load, new equipment capacity, or set-point/differential control values from baseline load, baseline unit capacity, and baseline control values and thus the cost avoidance analysis will be normalized to baseline conditions. Honeywell will provide verification that the equipment installed are operating to the specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for the 1st year of the Guarantee Period. Other equipment & processes will not be monitored. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined by data loggers. The energy use baselines are included in Exhibit 2. The baseline period dates are listed in exhibit 2. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance as stipulated below. Operational performance baseline parameters are included and presented in Exhibit 2.

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated and agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following;

- The Customer's sign-off of the Delivery & Acceptance certificate
- Verification of manufacturer's submittal specifications compared to the calculations
- Verification of factory start up reports compared to the calculations
- Potential-to-save verification will be determined based on efficiency improvements.

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
VAV kitchen hood system	Option A	Operational Performance	Manufacturer's submittal datasheets VFD efficiency Installation documents	Based on data logging and spreadsheet calculations		Monitoring Year 1 only, Year 2 through year 15 will be stipulated based on results of year 1

VAV kitchen hood system	Option A	Energy Savings	Improved Efficiency indicates reduced energy consumption	Based on data logging and spreadsheet calculations	. Monitoring Year 1 only Year 2 through year 15 will be stipulated based on results of year 1
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**4. Parameters to be Monitored & Sampling Plan**

<u>Point</u>	<u>Engineering Units</u>	<u>Interval</u>
AC Command	On/Off	15 min.
VFD Power	kW	15 min
VFD Power	Kwh	15 min.

Proposal Period: Data logging was conducted to assist in development of the baseline.

Pre-Installation & Baseline Verification: See above

Installation & Acceptance Period: Installation documents used to verify operating parameters of exhaust units to match projected and manufacturer specifications.

Performance Period (On-Going): Data trending will be conducted during year 1. A walk-through on an annual basis to observe general conditions of operation and perception of mechanical conditions will be conducted.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the exhaust system unit efficiency. Cost savings is energy unit savings times cost of energy per unit. The financial impact of energy savings Years 2 - end of guarantee will be stipulated.

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance. The exhaust hood energy savings calculation is included in Exhibit 2

**6. Determination of Non-Energy O&M Cost Impact**

No O&M savings were identified

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes

that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

**9. Reports & Documentation**

Same as CM -1.

**CM 13 VAV Building Automation**

**General Description & MV-Option Definition and Rationale:**

- Purpose of CM is to increase the efficiency of the existing BMS systems, by installing a common front end system.

Capacities and performance indices of the modified systems are presented below in this M&V plan and in the CM Savings Calculations attached hereto and incorporated herein as Exhibit 2.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the retrofitted EMS system use. All other existing or new equipment directly using are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building & process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. This program will not monitor performance period changes in exhaust system load, new equipment capacity, or set-point/differential control values from baseline load, baseline unit capacity, and baseline control values and thus the cost avoidance analysis will be normalized to baseline conditions. Honeywell will provide verification that the equipment installed are operating to the specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for the 1st year of the Guarantee Period. Other equipment & processes will not be monitored. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined by computer model. The energy use baseline is included in Exhibit 2. The baseline period dates are listed in exhibit 2. The baseline unit cost of energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance as stipulated below. Operational performance baseline parameters are included and presented in Exhibit 2.

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated and agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following;

- The Customer's sign-off of the Delivery & Acceptance certificate
- Verification of manufacturer's submittal specifications compared to the calculations

- Verification of factory start up reports compared to the calculations
- Potential-to-save verification will be determined based on savings calculated for three energy saving strategies.

Demand Control Ventilation	Chilled Water Reset Sequence
Night Time Set Back	

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
EMS	Option A	Operational Performance	Manufacturer's submittal datasheets Installation documents	Based on computer model	Implement strategies listed above	Monitoring Year 1 only, Year 2 through year 15 will be stipulated based on results of year 1
EMS	Option A	Energy Savings	Reduced energy consumption	Based on computer model	Implement strategies listed above	Monitoring Year 1 only Year 2 through year 15 will be stipulated based on results of year 1

#### 4. Parameters to be Monitored & Sampling Plan

<u>Point</u>	<u>Engineering Units</u>	<u>Interval</u>
Demand Control Ventilation Damper position	% open	15 min.
Outside CO2	ppm	15 min.
Inside CO2	ppm	15 min.
Chilled Water Supply Temperature	Deg F	15 min.
Chiller Water Return Temperature	Deg F	15 min.
Night Set Back Temp (per VAV Box)	Temperature	15 min.

Proposal Period: No data logging was conducted.

Pre-Installation & Baseline Verification: See above

Installation & Acceptance Period: Installation documents used to verify operating parameters of exhaust units to match projected and manufacturer specifications.

Performance Period (On-Going): Data trending will be conducted during year 1. A walk-through on an annual basis to observe general conditions of operation and perception of mechanical conditions will be conducted.

#### 5. Determination of Energy & Cost Avoidance

Energy cost savings for this measure are achieved through improvement of the exhaust system unit efficiency. Cost savings is energy unit savings times cost of energy per unit. The financial impact of energy savings Years 2 - end of guarantee will be stipulated.

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

Energy savings calculation is included in Exhibit 3.

**6. Determination of Non-Energy O&M Cost Impact**

No O&M savings were identified

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

**9. Reports & Documentation**

Same as CM -1.

**CM#14 - Automated Computer Power Management**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to reduce the run time of computer systems, relative to actual use and computer and monitor status.

- Savings are identified based on engineering calculations
- Savings is verified by inspection to see that software has been provided to the customer and has been installed and is operating as intended
- The quantity of devices controlled is a significant factor in performance of this CM. The City is responsible for executing the installation of the software to the specified number of devices.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is dependent on the installation and deployment of software that is designed to shut down or implement power save features of computer system components when the device is not in use. Multiple methodologies were selected to determine the energy and cost avoidance as cost effective approaches providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. Measured and stipulated parameters will be used on the application and energy impact.

**2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The energy performance baseline was determined from observance and engineering

calculations. The energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in section Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

Under *Option A* services, Honeywell will confirm that the software has been installed to project and manufacturers specifications, and that the quantity of improvement activities (# of work stations impacted) aligns with project specifications. The value of energy and cost avoidance is stipulated and agreed upon based on engineering calculations and customer acceptance.

### **3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the software systems have been installed within contract specifications to the specified quantity of devices. Verification documentation will include but not be limited to contractor start up documentation, software report data, and review of name plate and manufacturer specifications data.

### **4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on annual review of installation and annual documentation, to verify that the software has been installed and is operating within contract specifications, on a measured quantity of PC devices. Ongoing performance will be determined based on the number of systems controlled. The number of devices controlled is the responsibility of the city, baseline and post retrofit energy and costs avoidance adjustments will be implemented as needed.

### **5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure is achieved through reductions in electric consumption.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit energy consumption \* unit cost  
Minus

Post retrofit energy consumption\* unit cost.

The monitoring and sampling plan results will indicate energy and cost avoidance.

### **6. Determination of Non-Energy Operational Cost Impact**

There are no associated avoided Operational Costs from this CM

### **7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM i.e., device quantity, occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

### **8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

### **9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

## **CM# 15 Green Printing**

### **General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to reduce the run time of computer systems, relative to actual use and computer and monitor status.

- Savings are identified based on engineering calculations
- Savings is verified by inspection to see that software has been provided to the customer and has been installed and is operating as intended

### **3. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is dependent on the installation and deployment of software that is designed to minimize the quantity of paper used in document processing applications. Blended methodologies were selected to determine the energy and cost avoidance as cost effective approaches providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. Measured and stipulated parameters will be used on the application and energy impact.

### **4. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The performance baseline was determined from observance and engineering calculations. The usage baselines are included in Schedules F, H, and I. The baseline period dates are listed in section Schedule C. The baseline unit cost is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

Under *Option A* services, Honeywell will confirm that the software has been installed to project and manufacturers specifications, and that the improvement activities align with project expectations.

### **3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the Green Print Software systems have been installed within contract specifications. Verification documentation will include but not be limited to contractor start up documentation, software report data, and review of name plate and manufacturer specifications data.

### **4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on annual review of installation and annual documentation, to verify that the software has been installed and is operating within contract specifications, on a random sample of impacted PC devices. Ongoing performance will be determined based on the number of systems controlled. The number of devices controlled is the responsibility of the city, baseline and post retrofit energy and costs avoidance adjustments will be implemented as needed.

### **5. Determination of Energy & Cost Avoidance**

There is no energy cost avoidance guaranteed for this ECM

### **6. Determination of Non-Energy Operational Cost Impact**

Operational Cost is expected based on a reduction in paper and printing materials. The value of this cost avoidance

is not measured, but is estimated and is included in the financial model for this project.

Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

#### **7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of printing/copying components relative to this CM i.e., device quantity, occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K.

**Honeywell Risk Allocation:** Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

#### **8. Performance Period Definition and On-Going Activities**

**Performance Period Definition:** The performance period term overall is 15 years.

**On-Going Activities:** Annual measurement and verification as indicated.

#### **9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

### **CM#16 - Street Lighting Retrofit**

#### **General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to improve energy efficiency in street lighting systems. Energy avoidance will be measured through the use of Option A.

##### **1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the lighting system retrofit. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the street lighting retrofits. This is a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit* and not as a whole at the utility meter. This retrofit isolation approach, thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the street lighting systems installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer.

Other equipment & processes will not be monitored. Electrical energy is not monitored as part of this program.

Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined from existing systems manufacturer's performance specifications; the energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated to and agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following;  
Measurement and verification for this CM will be accomplished with Pre and Post installation measurements of the power draw for a representative sample of each type of fixture. The annual operating hours for each fixture will be stipulated.

**4. Parameters to be Monitored & Sampling Plan**

General: The measured parameter is limited to fixture amperage for a sample population of fixtures. Fixture quantity and types will be confirmed through contractor documentation. All other operating parameters including run time hours are stipulated and agreed upon.

Installation & Acceptance Period: The sampling methodology will utilize measurements taken on switches or breakers. These measurements include 5% of fixtures per technology type (lamp and ballast combinations) that comprise 80% of the lighting Conservation Measures (CM) kW reduction. Operational parameters (hours) will be stipulated.

Performance Period (On-Going): There will be no on-going measurements of fixture amperage for this CM. The on-going measurement will be limited to review of equipment maintenance records and operating conditions as presented by customer representatives during routine site visits by Honeywell M&V personnel

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the lighting fixture efficiency.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit fixture kWh \* hours \* unit cost  
Minus

Post retrofit fixture kWh\* hours\* unit cost.

The monitoring and sampling plan results will confirm fixture amperage by fixture type. Utility unit costs will be evaluated based on utility rate analysis. All other operating parameters (including hours) used in avoidance calculations are agreed upon and stipulated for the duration of the performance period.

**6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by the city will be used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in lighting related labor activities required to maintain ageing equipment, and reduction in lighting related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts;

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees

that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Maintain post retrofit status of street light components relative to this CM (i.e., occupancy level and use, hours of operation, etc.)
- Responsibilities as delineated in Schedules C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will measure to confirm that the capacity to perform (fixture kW, etc.) has been achieved. Honeywell will confirm through contractor records that the quantity of retrofit fixtures proposed has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are stipulated and agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as defined above.

**EXHIBIT 3**  
**Measurement and Verification Plan**

**CM#1 Generator – Load Shedding**

**General Description and MV-Option Definition and Rationale:**

The objective of this measure is to reduce demand charges by utilizing existing diesel emergency generators to load shed on event calls from Florida Power and Light. The following will be addressed with this measure:

- Generate demand charge savings by utilizing existing generators to fully power the building on a call from FP&L.
- Installing electrical wiring from new FP&L controller to generator.
- Renegotiate a demand load shedding rate/incentive structure with FP&L.

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**Conclusions and Recommendations:**

Honeywell is recommending that the existing generators for the Police Headquarters Building, Civic Center and Prineville Lime Plant be utilized to shift onto FP&L's load curtailment rider rate credit.

CMs Description	IPMVP M&V Option	Electric Savings Verification Method	Fuel Savings Verification Method	Water/Sewer Savings Verification Method
Generator Load Shedding	Option A	A	N/A	N/A
Generator Load Shedding	Option A	A	N/A	N/A

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the kW cost savings. A one-time inspection of the newly installed system will be conducted in year one (1). Cost avoidance will be calculated one time during year one (1) and deemed satisfied during the following years through the use of Option A. The energy performance baseline was determined from existing systems manufacturer's performance specifications, customer interviews, and utility bill analysis. The energy use baseline criteria are included herein. The baseline unit cost of energy is based on the base year rates paid by the Customer and will be considered to be the value of unit cost avoidance.

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**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

**Baseline:** The energy performance baseline was determined from existing systems manufacturer's performance specifications, customer interviews, and utility bill analysis. The energy use baseline criteria are included herein. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented herein. Under Option A services, Honeywell will confirm that the improvements have been installed to project and manufacturers specifications, and that the quantity and operation of the improvements align with project specifications. The value of energy and cost avoidance is agreed upon based on engineering calculations and customer acceptance as shown in the following tables:

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FP&L Acct #	Building	Honeywell Site #	Current 12 mon kWh (Nov 2010 to Oct 2011)	Previous 12 mon kWh (Nov 2009 to Oct 2010)	Current 12 mon kW (Nov 2010 to Oct 2011)	Previous 12 mon kW (Nov 2009 to Oct 2010)
3890326600	Police Dept., Bldg C	1	2,045,820	1,988,280	279	277
1954271407	Civic Center	53	2,363,040	2,461,440	514	548

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**Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:**

There are no projected baseline adjustments for this CM. The Customer and Honeywell have agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The savings are based on a utility rate and operational changes. The verification of potential-to-save will be based on completion of the following: Switching to FP&L's load curtailment rate and performing load curtailment as required. The annual savings potential will be agreed upon as the amounts presented herein. Verification will be performed during year one (1) only. The realized cost avoidance for this measure as determined in Engineering Calculations will not be adjusted for variations in consumption or loss of credits in the rates.

**4. Parameters to be Monitored & Sampling Plan**

**General:** The measured parameter is limited to utility bills. Notification of performance status will be provided to the customer on an annual basis. All other operating parameters including estimated savings projections are agreed upon.

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
Generator – Load Shedding	A	kW	none	Baseline utility bills		
Generator – Load Shedding	A	Operational		Used for emergencies only	Used for demand reduction	

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**Installation & Acceptance Period:** The sampling methodology will utilize measurements from analysis of operating history and utility bill data summarized below.

**Performance Period (On-Going):** There will be no recalculation of savings. An annual walk-through and customer information will confirm general operation to contract specifications and constitutes the on-going measurement. The on-going measurement will be limited to inspection of equipment and service records during routine site visits by Honeywell M&V personnel and reporting of utility rate consumption impacts using historic rates compared to rates achieved under this CM during year one (1) only.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through changing FPL rate.

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**6. Determination of Non-Energy Operational Cost Impact**

No operational savings are included in this contract.

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**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Maintain post retrofit status of building components relative to this CM (i.e., equipment repair and maintenance, ability to start up and operate during peak periods, perform due diligence to prevent failure in the customer's transfer switch, 12V pager switch or the failure in the starting of the generator, etc.).
- Responsibilities as delineated herein.
- Generator maintenance as identified in the following table.
- Appropriate adherence to Proposed Sequence of Operations or alternate equivalent Sequences of Operation.

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Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the performance specifications presented herein. Honeywell will inspect and analyze collected data to confirm that the capacity to perform has been achieved. Honeywell will confirm through contractor records that the quantity and capacity of the proposed equipment has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Honeywell will review rate structure and generator test report and run time logs sheets to confirm that the CM is still in place

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**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

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**CM 2: Building Lighting Retrofit**

**1. General Description & MV-Option Definition and Rationale:**

Purpose of CM is to increase the efficiency of the cities lighting systems. This is accomplished by replacing selected existing lighting fixtures with new energy efficient lighting systems. Retrofitting existing lighting to the most current technologies available will provide significant reductions in both the electrical demand and consumption at the facility.

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Capacities and performance indices of the Lighting Retrofit CM are presented below in this M&V plan, Exhibit 2. Lighting Details, and Savings Calculations attached hereto and incorporated herein.

**2. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the lighting system retrofit. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected as a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit* and not the building as a whole at the utility meter. This retrofit isolation approach thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the lighting systems installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer and by annual spot check of sample populations of systems. Other equipment & processes will not be monitored. Electrical energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired, can be provided at extra cost.

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**3. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

**Baseline:** The energy performance baseline was determined from existing systems manufacturer's performance specifications, Staff interviews, and utility bill analysis. The energy use baselines are included in Exhibit 2. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in exhibit 2.

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**Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:**

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated and agreed upon operational and energy baseline parameters.

**4. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following:

- Measurement and verification for this CM will be accomplished with Pre and Post installation measurements of the power draw for a representative sample of each type of retrofit.
- The annual operating hours for each fixture will be stipulated to the hours presented in the lighting line by line.
- Annual Cost Avoidance to be updated with current utility unit costs.

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CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
Lighting Retrofit	A	Energy	Fixture amperage Sample Pre and Post measurements	One-time measurement 5% of fixtures that comprise 80% of the kW reduction	One-time measurement 5% of fixtures that comprise 80% of the kW reduction at end of installation period will be done by the lighting sub-contractor.	Annual walk-through and visual inspection. No annual measurement will be done.
	A	Operational	Annual operating hours & times	Agreed upon based on interview data	Agreed upon to be same as baseline	Stipulated with annual review and walk-through

**5. Parameters to be Monitored & Sampling Plan**

**General:** Critical performance and operational parameters will be measured. Critical parameters are limited to fixture amperage. All other parameters are considered operational parameters including, but not limited to operating hours, weather, etc.

**Proposal Period:** Critical performance and operational parameters monitored were limited to fixture amperage.

**Pre-Installation & Baseline Verification:**

- Review & comment on the Contract between Customer and Honeywell regarding capacities and performance indices of the system.
- Baseline adjustments made based on review findings that are outside of the target performance indices.
- No other baseline verification activities are planned.

**Installation & Acceptance Period:** The sampling methodology will utilize measurements taken on switches or breakers. These measurements include 5% of fixtures per technology type (lamp and ballast combinations) that comprise 80% of the lighting Conservation Measures (CM) kW reduction. Due to minimal quantities and accepted

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energy usage, exit signs, and incandescent lamps will not be measured. Operational parameters (hours) will be stipulated in order to calculate savings (Exhibit-2).

**Performance Period (On-Going):** No Amperage measurements will be taken. An annual walk-through and visual inspection will be conducted on a sample of the facilities to ensure persistence of the CM savings. Over the course of a year, all buildings with lighting upgrades are intended to be inspected to make sure that the CM remains in place

**6. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the lighting fixture efficiency.

The determination of Cost Avoidance will utilize:

- Measurements of representative fixture amperage.
- Lighting Cost Avoidance calculations included in Exhibit 2

The monitoring and sampling plan results will be inserted into the calculations in Exhibit G4 – Savings Calculations to determine realized energy avoidance. In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

**7. Determination of Non-Energy O&M Cost Impact**

Invoice and Internal Work Order records provided by the city were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of historical Lighting Retrofit related invoice service activities in the Honeywell Service Agreement, reductions in lighting related labor activities required to maintain ageing equipment, and reduction in lighting related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

- The operational cost savings are deemed satisfied upon contract execution.
- The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings.
- The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**8. Customer Responsibilities and Honeywell-Customer Risk Allocation**

**Customer Responsibilities:** The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Provide current status of the building (i.e., occupancy level and use, hours of operation, etc.).
- Provide copies of utility bills affected by CM.
- Responsibilities as delineated in Schedule C and in Schedule J.
- Provide all maintenance records and purchase invoices pertaining to this measure.

**Honeywell Risk Allocation:** Successful guarantee performance is determined by meeting the cost avoidance presented in the Schedule of Savings in Schedule C, normalized to baseline conditions as described by the methods outlined in the Scope of Work, Schedule C, and Exhibits to Schedule C and this M&V plan.

**9. Performance Period Definition and On-Going Activities**

**Performance Period Definition:** The performance period term overall is 15 years.

**On-Going Activities:** Annual verification as defined above.

**10. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

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CM#3 - Sports Lighting & Control Retrofit Option A (Electric)

General Description & MV-Option Definition and Rationale:

The purpose of this CM is to increase the efficiency of the sports lighting & controls at various parks throughout the city. This will be accomplished by replacing selected existing sport lighting fixtures with new energy efficient lighting systems and controls. Retrofitting existing lighting and control systems to the most current technologies available will provide significant reductions in both the electrical demand and consumption at the facility.

Capacities and performance indices of the Lighting Retrofit CM are presented below in this M&V plan, Exhibit 2, *Lighting Details, and Engineered Cost Avoidance Calculations*, attached hereto and incorporated herein.

1. Boundary of Energy Use and Cost Avoidance Determination:

The energy cost avoidance determination for this CM is isolated to the sports lighting system retrofit. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the lighting & control retrofits at various parks throughout the city. This is a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit*. This retrofit isolation approach thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the lighting & control systems installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer.

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2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions

Baseline: The energy performance baseline was determined from existing systems manufacturer's performance specifications. The energy use baselines are included in exhibit 2. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H and I.

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Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated to and agreed upon operational and energy baseline parameters.

3. Potential-to-Save Verification Plan

The verification of potential-to-save will be based on completion of the following; Measurement and verification for this CM will be accomplished with Pre and Post installation measurements of the power draw for a representative sample of each type of fixture. The annual operating hours for each fixture will be stipulated to the hours presented in Schedules F and I.

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4. Parameters to be Monitored & Sampling Plan

General: The measured parameter is limited to fixture amperage for a sample population of fixtures. Fixture quantity and types will be confirmed through contractor documentation. All other operating parameters including run time hours are stipulated and agreed upon.

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Installation & Acceptance Period: The sampling methodology will utilize measurements taken on switches or breakers. These measurements include 5% of fixtures per technology type (lamp and ballast combinations) that comprise 80% of the lighting Conservation Measures (CM) kW reduction. Due to minimal quantities and accepted energy usage, exit signs, and incandescent lamps will not be measured. Operational parameters (hours) will be stipulated in order to calculate savings.

Performance Period (On-Going): There will be no on-going measurements of fixture amperage for Option A facilities. The on-going measurement will be limited to review of lamp and ballast failure conditions as presented by customer representatives during routine site visits by Honeywell M&V personnel.

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**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the lighting fixture efficiency.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

$$\text{Pre retrofit fixture kW} * \text{hours} * \text{unit cost} \\ \text{Minus}$$

$$\text{Post retrofit fixture kW} * \text{hours} * \text{unit cost}.$$

The monitoring and sampling plan results will confirm fixture amperage by fixture type. Utility unit costs will be evaluated based on utility rate analysis. All other operating parameters (including hours) used in avoidance calculations are agreed upon and stipulated for the duration of the performance period.

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**6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by the City were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in lighting related labor activities required to maintain ageing equipment, and reduction in lighting related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

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**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K.

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Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will measure to confirm that the capacity to perform (fixture kW, etc.) has been achieved. Honeywell will confirm through contractor records that the quantity of retrofit fixtures proposed has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual verification as defined above.

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**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

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**CM#4 Vending Machine Controls Retrofit**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to increase the efficiency of the vending machine systems throughout the city by installing occupancy type controls on the vending machine systems. Retrofitting existing vending machines to the most current technologies available will provide significant reductions in both the electrical demand and consumption at the facility.

Capacities and performance indices of the vending machine controls Retrofit CM are presented below in this M&V plan, and in Schedule F, attached hereto and incorporated herein.

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**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the vendmisers retrofit. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the vendmisers. This is a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit* and not the building as a whole at the utility meter. This retrofit isolation approach thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the vendmisers installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer.

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**2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined from existing systems manufacturer's performance specifications. The energy use baselines are included in Schedules F, H and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H and I.

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Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated to and agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following:  
Measurement and verification for this CM will be accomplished with manufacturer's performance specifications. The annual operating hours for each fixture will be agreed upon to be the hours presented in Schedules F and I.

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**4. Parameters to be Monitored & Sampling Plan**

General: The vendmisers parameters are based on the manufacturer's specifications. The savings will be based on energy calculations included herein. All other operating parameters including run time hours are agreed upon.

Performance Period (On-Going): There will be no on-going measurements of vendmisers for Option A facilities. The on-going measurement will be limited to review of vendmiser operation as presented by customer representatives during routine site visits by Honeywell M&V personnel.

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**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the vendmisers operation efficiency.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

$$\text{Pre retrofit fixture kW * hours * unit cost} \\ \text{Minus}$$

$$\text{Post retrofit fixture kW* hours* unit cost.}$$

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The monitoring and sampling plan results will confirm vendmiser operation. Utility unit costs will be evaluated based on utility rate analysis. All other operating parameters (including hours) used in avoidance calculations are agreed upon for the duration of the performance period.

**6. Determination of Non-Energy Operational Cost Impact**

There are no associated avoided Operational Costs from this CM

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**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

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- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated in Schedules C,F, I, J and K referenced and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K

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Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will confirm through contractor records that the quantity of vendmiser proposed has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are stipulated and agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

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On-Going Activities: Annual verification as defined above.

**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

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**CM#5: Water Upgrades**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to reduce water consumption and sewer service used in the city buildings. Equipment such as water faucets, toilets, urinals and showers will be retrofit with reduced water flow equipment.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to water consumption and sewer services. A *retrofit isolation approach* (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the Water Upgrades CM as a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the *isolated* boundary of this particular CM *retrofit* and not the building as a whole at the utility meter. This retrofit isolation approach thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the water utility meter that are not related to this CM. Honeywell will provide verification that the plumbing fixtures installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer and by spot check of sample populations of systems.

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Other equipment & processes will not be monitored.

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**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

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Guaranteed Energy, Water, & Wastewater Performance Savings Contract

Baseline: The energy performance baseline was determined using engineering calculations based on fixture specifications, fixture quantities, estimated occupancy and usage, and was compared to the utility bill for verification. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the quantity, type, and model of Water Upgrades devices have been installed.

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**4. Parameters to be Monitored & Sampling Plan**

General: The measured parameter is limited to verification of fixture quantity and types through contractor documentation. All other operating parameters including occupancy are stipulated and agreed upon.

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Installation & Acceptance Period: The installation documents will be reviewed to confirm that quantity and type of fixtures have been installed. M&V activities will confirm the general operation of the CM to contract specifications.

Write up in post installation report.

Performance Period (On-Going): There will be no on-going measurements, annual walk-through and customer information will confirm general operation and maintenance to contract specifications. All other parameters are agreed upon for the duration for the contract.

**5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure are achieved through reductions in water consumption and reductions in sewer charges based on reduced volume of waste water flowing to the sewer.

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The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit Gallons \* unit cost  
Minus

Post retrofit Gallons \* unit cost.

The monitoring and sampling plan results will indicate energy and cost avoidance.

**6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by city were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in related labor activities required to maintain ageing equipment, and reduction in related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

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The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.

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- Responsibilities as delineated in Schedules C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will measure to confirm that the capacity to perform has been achieved. Honeywell will confirm through contractor records that the quantity of retrofit fixtures proposed has been installed. Honeywell and customer agree that the on-going performance and operation (use per day, maintenance, etc.) are agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual verification as indicated based on annual walk through and visual inspection.

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**9. Reports and Documentation:** There will be a single (1) annual report of the determination of energy avoidance each year

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**CM#6 - Building Envelope Improvements**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to reduce the loss of energy through air infiltration or leakage around doors, windows, wall penetrations or poor or missing insulating materials that cause loss of conditioned air, or introduction of unconditioned air to conditioned spaces. The loss of conditioned air or introduction of unconditioned air increases the heating load on the heating systems and increases in cooling loads on Air Conditioning systems.

- Includes installation of weather stripping and caulking
- Includes Window Replacements
- Includes Roof Replacement

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**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is dependent on the reduced loss of energy through air infiltration or leakage around doors, windows, roofs, wall penetrations or poor or missing insulating materials that cause loss of conditioned air, or introduction of unconditioned air to conditioned spaces. Multiple methodologies were selected to determine the energy and cost avoidance as cost effective approaches providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. Measured and stipulated parameters will be used on the application and energy impact.

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**2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The energy performance baseline was determined from observance and engineering calculations. The energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in section Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedule F, H, and I.

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Under *Option A* services, Honeywell will confirm that the improvements have been installed to project and manufacturers specifications, and that the quantity of improvement activities aligns with project specifications. The value of energy and cost avoidance is stipulated and agreed upon based on engineering calculations and customer acceptance.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the building envelope retrofits have been installed within contract specifications. Verification documentation will include, but not be limited to, contractor start up documentation, and review of name plate and manufacturer specifications data.

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**4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on review of installation documents, to verify that the quantity and type of building envelope retrofits have been installed within contract specifications. Annual visual inspection will be the only verification activity provided, avoided energy and costs will be agreed upon based on customer acceptance.

**5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure is achieved through reductions in energy consumption.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit energy consumption \* unit cost  
Minus

Post retrofit energy consumption\* unit cost.

The monitoring and sampling plan results will indicate energy and cost avoidance.

**6. Determination of Non-Energy Operational Cost Impact**

There are no associated avoided Operational Costs from this CM.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K.

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Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option A buildings will quantify energy and cost avoidance as stipulated ad agreed upon based on year 1 verification activities plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the heating energy baseline.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: FOR THIS CM ONLY **The performance period term overall is 10 years.**

On-Going Activities: Annual measurement and verification as indicated.

**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

**CM#7 Municipal Complex Campus High Efficiency Chiller Plant**

**General Description & MV-Option Definition and Rationale:**

This option would consist of a campus chilled water plant utilizing (2) 250 ton high efficiency water cooled chillers and cooling towers centrally located at the current Building B air cooled chiller pad. New underground chilled water piping would be routed from the central campus to Buildings A and C. The existing building pumps would be utilized as secondary pumps. The older and inefficient chillers at Buildings A and C would be removed. The newer chiller at building C would remain as backup. The two existing air cooled chillers for Building B would be removed

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**Guaranteed Energy, Water, & Wastewater Performance Savings Contract**

and be able to be stored and rigged back in the event of an emergency. Emergency taps would be provided at each building.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the chillers. All other existing or new equipment directly using are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building and process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. This program will not monitor performance period changes in chilled water load, new equipment capacity, or set-point/differential control values from baseline load, baseline chiller capacity, and baseline control values and thus the cost avoidance analysis will be normalized to baseline conditions. Honeywell will provide verification that the new chillers are installed and operating to the specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for each year of the Guarantee Period.

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Other equipment and processes will not be monitored. Electrical energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined by computer model. The energy use baselines are included in the exhibits.

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Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have agreed upon general performance, operational, and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following:

- The Customer's sign-off of the Delivery & Acceptance certificate.
- Verification of manufacturer's submittal specifications compared to the calculations.
- Verification of factory start up reports compared to the calculations.
- Potential-to-save verification will be determined based on Chiller efficiency improvements.

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CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
Chillers	Option B	Operational Performance	Manufacturer's submittal, datasheets (kw/ton), Chiller Efficiency (kw/ton), Installation documents	Existing Chiller Efficiency	Operational hours used in model	Year 1
Chiller and Cooling Tower Replacement	Option B	Energy Savings	1. kW per Ton, 2. % load 3. Total Tons	Baseline Energy Consumption Data as simulated in computer model	Efficiency of the new chillers to be based on the table below	Years 1

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Performance Points rated at AHRI Condenser Relief:													
Point #	%Load Request	Capacity (ton)	Input Power (kW)	Performance (kW/ton)	Operating RLA (A)	Evaporator				Condenser			
						Flow (gpm)	EWT (°F)	LWT (°F)	PD (ftH2O)	Flow (gpm)	EWT (°F)	LWT (°F)	PD (ftH2O)
1	100.0	270.0	160.1	0.593	230	648.1	55.0	45.0	21.4	810.0	85.0	94.3	16.4
2	75.0	202.5	82.8	0.409	120	648.1	52.5	45.0	21.5	810.0	75.0	81.7	17.0
3	50.0	135.0	36.1	0.268	58	648.1	50.0	45.0	21.6	810.0	65.0	69.3	17.8
4	25.0	67.5	17.4	0.258	29	648.1	47.5	45.0	21.6	810.0	65.0	67.1	17.8

#### 4. Parameters to be Monitored & Sampling Plan

##### Monitored Parameters

The following data will be monitored/calculated after construction of the building is complete:

Cooling load (tons) produced by the chillers.  
Electricity consumption of the new chiller.

##### Data Collection Plan

The electricity consumption (kWh) and demand (kW) of the chillers will be collected for a period of one year after the installation.

The following points will be monitored for the new chillers.

Point	Engineering Units	Interval
Chiller Command	On/Off	15 min.
Chiller Power	kW	15 min
Chiller Tons	Tons	15 min.
% load	%	15 min.

##### Savings Analysis Method

The savings for will be calculated from the following equation:

$$kWh_{savings} = kWh_{meter} \times \left\{ \left[ \frac{kW/ton_{base}}{kW/ton_{new} \text{ rated}} \right] - 1 \right\} \times \left( \frac{CDD(65)_{TMY}}{CDD(65)_{meter}} \right)$$

$$kW_{savings} = kW_{post} \times \left\{ \left[ \frac{kW/ton_{base}}{kW/ton_{new} \text{ rated}} \right] - 1 \right\} \times \left( \frac{CDD(65)_{TMY}}{CDD(65)_{meter}} \right)$$

Proposal Period: No data logging or spot measurements were conducted.

Pre-Installation & Baseline Verification: No data logging or spot measurements will be conducted.

Installation & Acceptance Period: Installation documents used to verify operating parameters of chiller to match projected and manufacturer specifications. Chiller efficiency values to be used to calculate energy savings. Baseline efficiency and baseline energy consumption to be compared to post retrofit efficiency times baseline

**Guaranteed Energy, Water, & Wastewater Performance Savings Contract**

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energy consumption.

Performance Period (On-Going): Data logging will be accomplished by trending the points listed above. Walk-through on an annual basis will be conducted to observe general conditions of operation and perception of mechanical conditions.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the chiller efficiency. Because Honeywell will not be controlling the plant operation, the savings will be deemed satisfied if the chillers meet or exceed the four efficiency points noted below at the stated conditions listed in section 3 above.

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% Load	Kw/Ton
100%	.593
75%	.409
50%	.268
25%	.258

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

**6. Determination of Non-Energy O&M Cost Impact**

Invoice and Internal Work Order records provided by Customer were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of historical chiller or cooling tower system related invoice service activities in the Honeywell Service Agreement, reductions in chiller and cooling tower system related labor activities required to maintain ageing equipment, and reduction in chiller and cooling tower system related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

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**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Provision of chiller false loading if necessary for testing.
- By execution of this contract, Customer deems the chiller run times as stipulated and agreed-to.
- By execution of this contract, Customer acknowledges they have reviewed the energy savings calculation, presented in the Exhibits, and agree that they are appropriate for determination of energy avoidance.
- By execution of this contract, Customer represents that they understand that their total electric consumption may increase even with the savings at the chiller if the plant is run for additional hours then the base year.
- Performance of responsibilities outlined in in Schedules C, F, I, J and K.
- Annual (minimum) chiller maintenance.

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By execution of this contract, Customer deems the savings value and the methodology and the results as agreed-to.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the cost avoidance presented in Section 1 of exhibit 3, normalized to baseline conditions as described by the methods outlined in the M&V plan.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-going Activities:  
No on-going M&V.

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**9. Reports & Documentation**

Same as CM#1.

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**CM#8 - Chilled Water Pumping Optimization**

**General Description & MV-Option Definition and Rationale:**

Purpose of CM is to increase the efficiency of the chilled water pumping system. This is accomplished by replacing the old 2 way valves with new 2 way valves and installing new motor VFD's and pump motors.

Capacities and performance indices of the chilled water system are presented below in this M&V plan and in the CM Savings Calculations attached hereto and incorporated herein.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the chilled water systems of the City Hall buildings A,B, C and Civic Center. All other existing or new equipment directly using are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building & process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. Honeywell will provide verification that the chilled water systems are operating to the specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for each year of the Guarantee Period.

Other equipment & processes will not be monitored. Electrical energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

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**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined using computer model. The energy use baselines are included in Exhibit 2. The baseline unit cost of energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance as stipulated below. Operational performance baseline parameters are included and presented in Exhibit 2.

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have agreed upon operational and energy baseline parameters.

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**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following;

- The Customer's sign-off of the Delivery & Acceptance certificate
- Verification of manufacturer's submittal specifications compared to the calculations
- Verification of factory start up reports compared to the calculations
- Potential-to-save verification will be determined based on Chiller efficiency improvements.

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CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
Chiller Water Pumping	Option B	Operational Performance	Manufacturer's submittal, datasheets and Installation documents	3 way valves and constant volume pumping	2 way valves and VFD on new pump motors	Annual reporting
Chilled water pumping	Option B	Energy Savings	Improved Efficiency indicates reduced energy consumption	Baseline Energy Consumption Data from computer model	Baseline Energy Consumption minus Energy Consumption @ Post Retrofit consumption	Year 1 through Year 15.

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**4. Parameters to be Monitored & Sampling Plan**

General: Operating parameters are limited to change in chiller efficiency. Energy Calculation summary is presented in Exhibit G2-3.

Proposal Period: No data logging or spot measurements were conducted.

Pre-Installation & Baseline Verification: No data logging or spot measurements will be conducted.

Installation & Acceptance Period: Installation documents used to verify operating parameters of chiller to match projected and manufacturer specifications. Chiller efficiency values to be used to calculate energy savings. Baseline efficiency and baseline energy consumption to be compared to post retrofit efficiency times baseline energy consumption.

Performance Period (On-Going): Data logging or spot measurements will be conducted to verify operation within the projected performance parameters. A walk-through on an annual basis to observe general conditions of operation and perception of mechanical conditions will also be made.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the chiller efficiency. Cost savings is energy unit savings times cost of energy per unit.

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

**6. Determination of Non-Energy O&M Cost Impact**

Invoice and Internal Work Order records provided by Customer were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of historical chiller or cooling tower system related invoice service activities in the Honeywell Service Agreement, reductions in chiller and cooling tower system related labor activities required to maintain ageing equipment, and reduction in chiller and cooling tower system related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Guaranteed Energy, Water, & Wastewater Performance Savings Contract

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CM-2: Chiller and Cooling Tower Replacements ... [4]

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The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- By execution of this contract, Customer deems the chilled water system load as stipulated and agreed-to.
- By execution of this contract, Customer acknowledges they have reviewed the energy savings calculation and agree that they are appropriate for determination of energy avoidance. By execution of this contract, Customer represents that they understand that their total electric consumption may increase even with the savings at the chilled water system if the operated hours are increased over based year hours.
- Performance of responsibilities outlined herein.
- Annual (minimum) chiller water system maintenance.

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Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the cost avoidance presented herein.

• **Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-going Activities:

No on-going M&V.

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9. **Reports & Documentation**

Same as CM#1.

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**CM#9 - Mechanical Retrofit Package DX Systems**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to improve energy efficiency in various mechanical systems; systems impacted are indicated in detail in Schedule A. Energy avoidance will be measured through the use of Option A.

1. **Boundary of Energy Use and Cost Avoidance Determination:**

Option A was selected to determine the energy and cost avoidance for the Packaged DX Systems as a cost effective approach providing an acceptable balance between the cost of doing Measurement and Verification (M&V) versus the quantity of projected Cost Avoidance. This method analyzes energy use within the building based on standard engineering practices and principals. This approach does not require the time and expense necessary to track on-site changes that effect electric and gas energy consumption as seen at the utility meters. Potential to perform is verified by review of installation documentation and observed conditions, in that all improvements have been completed to project specifications.

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2. **Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The energy performance baseline was determined from observance and engineering calculations. The energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

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Under *Option A* services, Honeywell will confirm that the improvements have been installed to project and manufacturers specifications, and that the quantity of improvement activities aligns with project specifications. The value of energy and cost avoidance is agreed upon based on engineering calculations and customer acceptance.

3. **Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the mechanical retrofit systems have been installed within contract specifications. Verification documentation will include, but not be limited to, contractor start up documentation, combustion analysis, and review of name plate and manufacturer specifications data.

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**4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on review of installation documents to verify that the quantity and type of mechanical retrofits have been installed within contract specifications. On-going measurement will be provided to confirm operation and maintenance to project specifications, avoided energy and costs will be determined based on data collected. Site walk-through will be conducted to confirm that the CM is still in place and functioning as intended based on the observations indicated;

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- Verify through visual observation that the CM is still installed and has been properly maintained.
- Verify to the limits of visual observation that the CM is still functional to specifications of project.
- Review current manual set points and manual settings. Record changes in the operation, control sequences and control set points of the CM's from original installed conditions.
- Review observations about the current status of the building (i.e. occupancy, use), compare to Customer records, and compare against the contractual baseline and required post-retrofit operating conditions.
- Record observed addition or deletion of site equipment, which may impact the CM's or the building energy consumption and compare to Customer records.
- Record observations regarding other changes on-site that may impact the CM's or the building energy consumption.

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**5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure is achieved through reductions in electric consumption.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit energy unit cost  
Minus

Post retrofit energy unit cost.

The monitoring and sampling plan results will indicate energy and cost avoidance.

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**6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by the city were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in related labor activities required to maintain ageing equipment, and reduction in related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

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**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K.

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Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein.. Option A buildings will quantify energy and cost avoidance as stipulated and agreed upon based on year 1 verification activities plus the identified unit cost escalation. Customer is responsible to provide Honeywell with

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notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

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**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

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**CM#10 – Dedicated AC for City Hall MIS Server Room**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to install a dedicated A/C system for City Hall MIS server room. Energy avoidance will be measured through the use of Option A.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

Option A, was selected to determine the energy and cost avoidance for the Packaged DX Systems. As a cost effective approach providing an acceptable balance between the cost of doing Measurement and Verification (M&V) versus the quantity of projected Cost Avoidance. This method analyzes energy use within the building based on standard engineering practices and principals. This approach does not require the time and expense necessary to track on-site changes that effect electric and gas energy consumption as seen at the utility meters. Potential to perform is verified by review of installation documentation and observed conditions, in that all improvements have been completed to project specifications.

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**2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The energy performance baseline was determined from observance and engineering calculations. The energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H and I.

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Under *Option A* services, Honeywell will confirm that the improvements have been installed to project and manufacturers specifications, and that the quantity of improvement activities aligns with project specifications. The value of energy and cost avoidance is stipulated and agreed upon based on engineering calculations and customer acceptance.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the mechanical retrofit systems have been installed within contract specifications. Verification documentation will include, but not be limited to, contractor start up documentation, combustion analysis, and review of name plate and manufacturer specifications data.

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**4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on review of installation documents, to verify that the quantity and type of mechanical retrofits have been installed within contract specifications. No on-going measurement will be provided, avoided energy and costs will be stipulated and agreed upon based on customer acceptance. Site walk-through will be conducted to confirm that the CM is still in place and functioning as intended based on the observations indicated;

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- Verify through visual observation that the CM is still installed and has been properly maintained.

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- Verify to the limits of visual observation that the CM is still functional to specifications of project.
- Review current manual set points and manual settings. Record changes in the operation, control sequences and control set points of the CM's from original installed conditions.
- Review observations about the current status of the building (i.e. occupancy, use), compare to Customer records, and compare against the contractual baseline and required post-retrofit operating conditions.
- Record observed addition or deletion of site equipment, which may impact the CM's or the building energy consumption and compare to Customer records.
- Record observations regarding other changes on-site that may impact the CM's or the building energy consumption.

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**5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure is achieved through reductions in electric consumption.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit energy unit cost  
Minus

Post retrofit energy unit cost.

The monitoring and sampling plan results will indicate energy and cost avoidance.

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**6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by the city were used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in related labor activities required to maintain ageing equipment, and reduction in related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts;

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

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**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K

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Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option A buildings will quantify energy and cost avoidance as stipulated and agreed upon based on year 1 verification activities plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

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**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

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**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

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**CM 12 VAV Kitchen Hood Systems Retrofit/Optimization**

**General Description & MV-Option Definition and Rationale:**

- Purpose of CM is to increase the efficiency of the existing kitchen exhaust systems, equipment and controls. This is accomplished by installing new VFD's.

Capacities and performance indices of the modified systems are presented below in this M&V plan and in the CM Savings Calculations attached hereto and incorporated herein as Exhibit 2.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the retrofitted kitchen exhaust use. All other existing or new equipment directly using are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building & process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. This program will not monitor performance period changes in exhaust system load, new equipment capacity, or set-point/differential control values from baseline load, baseline unit capacity, and baseline control values and thus the cost avoidance analysis will be normalized to baseline conditions. Honeywell will provide verification that the equipment installed are operating to the specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for the 1st year of the Guarantee Period. Other equipment & processes will not be monitored. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

**Baseline:** The energy performance baseline was determined by data loggers. The energy use baselines are included in Exhibit 2. The baseline period dates are listed in exhibit 2. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance as stipulated below. Operational performance baseline parameters are included and presented in Exhibit 2.

**Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:**

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated and agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following:

- The Customer's sign-off of the Delivery & Acceptance certificate
- Verification of manufacturer's submittal specifications compared to the calculations
- Verification of factory start up reports compared to the calculations
- Potential-to-save verification will be determined based on efficiency improvements.

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
VAV kitchen hood system	Option A	Operational Performance	Manufacturer's submittal datasheets VFD efficiency Installation documents	Based on data logging and spreadsheet calculations		Monitoring Year 1 only, Year 2 through year 15 will be stipulated based on results of year 1

**Deleted:** CM 11 VAV Air Handling Systems Retrofit/Optimization¶

**General Description & MV-Option Definition and Rationale:**¶

Purpose of CM is to increase the efficiency of the existing VAV systems, equipment and controls. This is accomplished by replacing the old inlet guide vanes and by-pass dampers with new VFD's and motors. ¶

Capacities and performance indices of the modified systems are presented below in this M&V plan and in the CM Savings Calculations attached hereto and incorporated herein as Exhibit 2.¶

**<#>Boundary of Energy Use and Cost Avoidance Determination:**¶

The energy cost avoidance determination for this CM is isolated to the retrofitted air handlers' use. All other existing or new equipment directly using energy are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building and process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. This program will not monitor performance period changes in air handler unit load, new equipment capacity, or set-point/differential control values from baseline load, baseline roof top unit capacity, and baseline control values and thus the cost avoidance analysis will be normalized to baseline conditions. Honeywell will provide verification that the equipment installed are operating to the specifications of the manufacturer and to the specifications projected in the proposal through (... [5]

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VAV kitchen hood system	Option A	Energy Savings	Improved Efficiency indicates reduced energy consumption	Based on data logging and spreadsheet calculations		. Monitoring Year 1 only Year 2 through year 15 will be stipulated based on results of year 1
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**4. Parameters to be Monitored & Sampling Plan**

<u>Point</u>	<u>Engineering Units</u>	<u>Interval</u>
AC Command	On/Off	15 min.
VFD Power	kW	15 min
VFD Power	Kwh	15 min.

Proposal Period: Data logging was conducted to assist in development of the baseline.

Pre-Installation & Baseline Verification: See above

Installation & Acceptance Period: Installation documents used to verify operating parameters of exhaust units to match projected and manufacturer specifications.

Performance Period (On-Going): Data trending will be conducted during year 1. A walk-through on an annual basis to observe general conditions of operation and perception of mechanical conditions will be conducted.

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the exhaust system unit efficiency. Cost savings is energy unit savings times cost of energy per unit. The financial impact of energy savings Years 2 - end of guarantee will be stipulated.

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance. The exhaust hood energy savings calculation is included in Exhibit 2

**6. Determination of Non-Energy O&M Cost Impact**

No O&M savings were identified

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes

**Guaranteed Energy, Water, & Wastewater Performance Savings Contract**

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that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

**9. Reports & Documentation**

Same as CM -1.

**CM 13 VAV Building Automation**

**General Description & MV-Option Definition and Rationale:**

- Purpose of CM is to increase the efficiency of the existing BMS systems, by installing a common front end system.

Capacities and performance indices of the modified systems are presented below in this M&V plan and in the CM Savings Calculations attached hereto and incorporated herein as Exhibit 2.

**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the retrofitted EMS system use. All other existing or new equipment directly using are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building & process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. This program will not monitor performance period changes in exhaust system load, new equipment capacity, or set-point/differential control values from baseline load, baseline unit capacity, and baseline control values and thus the cost avoidance analysis will be normalized to baseline conditions. Honeywell will provide verification that the equipment installed are operating to the specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for the 1st year of the Guarantee Period. Other equipment & processes will not be monitored. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined by computer model. The energy use baseline is included in Exhibit 2. The baseline period dates are listed in exhibit 2. The baseline unit cost of energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance as stipulated below. Operational performance baseline parameters are included and presented in Exhibit 2.

Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated and agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following;

- The Customer's sign-off of the Delivery & Acceptance certificate
- Verification of manufacturer's submittal specifications compared to the calculations

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- Verification of factory start up reports compared to the calculations
- Potential-to-save verification will be determined based on savings calculated for three energy saving strategies.

Demand Control Ventilation	Chilled Water Reset Sequence
Night Time Set Back	

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
EMS	Option A	Operational Performance	Manufacturer's submittal datasheets Installation documents	Based on computer model	Implement strategies listed above	Monitoring Year 1 only, Year 2 through year 15 will be stipulated based on results of year 1
EMS	Option A	Energy Savings	Reduced energy consumption	Based on computer model	Implement strategies listed above	Monitoring Year 1 only Year 2 through year 15 will be stipulated based on results of year 1

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4. Parameters to be Monitored & Sampling Plan

<u>Point</u>	<u>Engineering Units</u>	<u>Interval</u>
Demand Control Ventilation Damper position	% open	15 min.
Outside CO2	ppm	15 min.
Inside CO2	ppm	15 min.
Chilled Water Supply Temperature	Deg F	15 min.
Chiller Water Return Temperature	Deg F	15 min.
Night Set Back Temp (per VAV Box)	Temperature	15 min.

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EMS ... [7]

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Proposal Period: No data logging was conducted.

Pre-Installation & Baseline Verification: See above

Installation & Acceptance Period: Installation documents used to verify operating parameters of exhaust units to match projected and manufacturer specifications.

Performance Period (On-Going): Data trending will be conducted during year 1. A walk-through on an annual basis to observe general conditions of operation and perception of mechanical conditions will be conducted.

5. Determination of Energy & Cost Avoidance

Energy cost savings for this measure are achieved through improvement of the exhaust system unit efficiency. Cost savings is energy unit savings times cost of energy per unit. The financial impact of energy savings Years 2 - end of guarantee will be stipulated.

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

**Guaranteed Energy, Water, & Wastewater Performance Savings Contract**

**Exhibit 3 – Page 25**

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Energy savings calculation is included in Exhibit 3.

**6. Determination of Non-Energy O&M Cost Impact**

No O&M savings were identified

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**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K

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**Honeywell Risk Allocation:** Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

**8. Performance Period Definition and On-Going Activities**

**Performance Period Definition:** The performance period term overall is 15 years.

**On-Going Activities:** Annual measurement and verification as indicated.

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**9. Reports & Documentation**

Same as CM -1.

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**CM#14 - Automated Computer Power Management**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to reduce the run time of computer systems, relative to actual use and computer and monitor status.

- Savings are identified based on engineering calculations
- Savings is verified by inspection to see that software has been provided to the customer and has been installed and is operating as intended
- The quantity of devices controlled is a significant factor in performance of this CM. The City is responsible for executing the installation of the software to the specified number of devices.

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**1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is dependent on the installation and deployment of software that is designed to shut down or implement power save features of computer system components when the device is not in use. Multiple methodologies were selected to determine the energy and cost avoidance as cost effective approaches providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. Measured and stipulated parameters will be used on the application and energy impact.

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**2. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

**Option A Baseline:** The energy performance baseline was determined from observance and engineering

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**Guaranteed Energy, Water, & Wastewater Performance Savings Contract**

calculations. The energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in section Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

Under *Option A* services, Honeywell will confirm that the software has been installed to project and manufacturers specifications, and that the quantity of improvement activities (# of work stations impacted) aligns with project specifications. The value of energy and cost avoidance is stipulated and agreed upon based on engineering calculations and customer acceptance.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the software systems have been installed within contract specifications to the specified quantity of devices. Verification documentation will include but not be limited to contractor start up documentation, software report data, and review of name plate and manufacturer specifications data.

**4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on annual review of installation and annual documentation, to verify that the software has been installed and is operating within contract specifications, on a measured quantity of PC devices. Ongoing performance will be determined based on the number of systems controlled. The number of devices controlled is the responsibility of the city, baseline and post retrofit energy and costs avoidance adjustments will be implemented as needed.

**5. Determination of Energy & Cost Avoidance**

Energy cost avoidance for this measure is achieved through reductions in electric consumption.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

$$\begin{aligned} & \text{Pre retrofit energy consumption * unit cost} \\ & \text{Minus} \\ & \text{Post retrofit energy consumption* unit cost.} \end{aligned}$$

The monitoring and sampling plan results will indicate energy and cost avoidance.

**6. Determination of Non-Energy Operational Cost Impact**

There are no associated avoided Operational Costs from this CM

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM i.e., device quantity, occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K.

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Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

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**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

**9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

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**CM# 15 Green Printing**

**General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to reduce the run time of computer systems, relative to actual use and computer and monitor status.

- Savings are identified based on engineering calculations
- Savings is verified by inspection to see that software has been provided to the customer and has been installed and is operating as intended

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**3. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is dependent on the installation and deployment of software that is designed to minimize the quantity of paper used in document processing applications. Blended methodologies were selected to determine the energy and cost avoidance as cost effective approaches providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. Measured and stipulated parameters will be used on the application and energy impact.

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**4. Baseline: Conditions & Energy Data AND Planned & Unplanned Baseline Adjustment Conditions**

Option A Baseline: The performance baseline was determined from observance and engineering calculations. The usage baselines are included in Schedules F, H, and I. The baseline period dates are listed in section Schedule C. The baseline unit cost is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

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Under *Option A* services, Honeywell will confirm that the software has been installed to project and manufacturers specifications, and that the improvement activities align with project expectations.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on review of installation documents, to verify that the Green Print Software systems have been installed within contract specifications. Verification documentation will include but not be limited to contractor start up documentation, software report data, and review of name plate and manufacturer specifications data.

**4. Parameters to be Monitored & Sampling Plan**

General Option A: The verification of potential-to-save will be based on annual review of installation and annual documentation, to verify that the software has been installed and is operating within contract specifications, on a random sample of impacted PC devices. Ongoing performance will be determined based on the number of systems controlled. The number of devices controlled is the responsibility of the city, baseline and post retrofit energy and costs avoidance adjustments will be implemented as needed.

**5. Determination of Energy & Cost Avoidance**

There is no energy cost avoidance guaranteed for this ECM

**6. Determination of Non-Energy Operational Cost Impact**

Operational Cost is expected based on a reduction in paper and printing materials. The value of this cost avoidance

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is not measured, but is estimated and is included in the financial model for this project.

Operational savings are based on the following agreed upon concepts:

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

#### **7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of printing/copying components relative to this CM i.e., device quantity, occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedules C, F, I, J and K.

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**Honeywell Risk Allocation:** Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

#### **8. Performance Period Definition and On-Going Activities**

**Performance Period Definition:** The performance period term overall is 15 years.

**On-Going Activities:** Annual measurement and verification as indicated.

#### **9. Reports & Documentation**

There will be a single (1) annual report of the determination of energy avoidance each year.

### **CM#16 - Street Lighting Retrofit**

#### **General Description & MV-Option Definition and Rationale:**

The purpose of this CM is to improve energy efficiency in street lighting systems. Energy avoidance will be measured through the use of Option A.

#### **1. Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the lighting system retrofit. A retrofit isolation approach (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the street lighting retrofits. This is a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the isolated boundary of this particular CM retrofit and not as a whole at the utility meter. This retrofit isolation approach, thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the street lighting systems installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer.

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Other equipment & processes will not be monitored. Electrical energy is not monitored as part of this program.

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Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**2. Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

Baseline: The energy performance baseline was determined from existing systems manufacturer's performance specifications; the energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

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Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated to and agreed upon operational and energy baseline parameters.

**3. Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following:

Measurement and verification for this CM will be accomplished with Pre and Post installation measurements of the power draw for a representative sample of each type of fixture. The annual operating hours for each fixture will be stipulated.

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**4. Parameters to be Monitored & Sampling Plan**

General: The measured parameter is limited to fixture amperage for a sample population of fixtures. Fixture quantity and types will be confirmed through contractor documentation. All other operating parameters including run time hours are stipulated and agreed upon.

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Installation & Acceptance Period: The sampling methodology will utilize measurements taken on switches or breakers. These measurements include 5% of fixtures per technology type (lamp and ballast combinations) that comprise 80% of the lighting Conservation Measures (CM) kW reduction. Operational parameters (hours) will be stipulated.

Performance Period (On-Going): There will be no on-going measurements of fixture amperage for this CM. The on-going measurement will be limited to review of equipment maintenance records and operating conditions as presented by customer representatives during routine site visits by Honeywell M&V personnel

**5. Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the lighting fixture efficiency.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

$$\text{Pre retrofit fixture kWh} * \text{hours} * \text{unit cost}$$

Minus

$$\text{Post retrofit fixture kWh} * \text{hours} * \text{unit cost}$$

The monitoring and sampling plan results will confirm fixture amperage by fixture type. Utility unit costs will be evaluated based on utility rate analysis. All other operating parameters (including hours) used in avoidance calculations are agreed upon and stipulated for the duration of the performance period.

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**6. Determination of Non-Energy Operational Cost Impact**

Invoice and Internal Work Order records provided by the city will be used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in lighting related labor activities required to maintain ageing equipment, and reduction in lighting related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts;

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees

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that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

**7. Customer Responsibilities and Honeywell-Customer Risk Allocation**

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Maintain post retrofit status of street light components relative to this CM (i.e., occupancy level and use, hours of operation, etc.)
- Responsibilities as delineated in Schedules C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will measure to confirm that the capacity to perform (fixture kW, etc.) has been achieved. Honeywell will confirm through contractor records that the quantity of retrofit fixtures proposed has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are stipulated and agreed upon and are the responsibility of and under the control of the customer.

**8. Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as defined above.

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**CM#16 - Street Lighting Retrofit**¶  
¶  
General Description & MV-Option Definition and Rationale: ¶  
¶  
The purpose of this CM is to improve energy efficiency in street lighting systems. Energy avoidance will be measured through the use of Option A.¶  
¶  
.Boundary of Energy Use and Cost Avoidance Determination:¶  
The energy cost avoidance determination for this CM is isolated to the lighting system retrofit. A retrofit isolation approach (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the street lighting retrofits. This is a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the isolated boundary of this particular CM retrofit and not as a whole at the utility meter. This retrofit isolation approach, thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the street lighting systems installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer. ¶  
¶  
Other equipment & processes will not be monitored. Electrical energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost. ¶  
¶  
Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions¶ ... [8]

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## CM-1: Generator – Load Shedding

	kWh Savings	Elect Savings (\$)	Diesel (Gals)	Diesel Savings (\$)	
Police Dept. Bldg C	N/A	\$4,909	N/A	-\$749	\$4,160
Civic Center	N/A	\$16,314	N/A	-\$1,248	\$15,065
Prineville Lime Plant	N/A	\$9,206	N/A	-\$999	\$8,207

## CM-1: Lighting Retrofit

Annual Energy Cost Avoidance:	\$82,691
Annual O&M Cost Avoidance:	\$7,361
Net Annual Cost Avoidance:	\$90,052

## CM-2: Chiller and Cooling Tower Replacements

Annual Energy Cost Avoidance:	\$123,512
Annual O&M Cost Avoidance:	\$32,709
Net Annual Cost Avoidance:	\$156,221

## CM-2: Chiller and Cooling Tower Replacements

Annual Energy Cost Avoidance:	\$11,214
Annual O&M Cost Avoidance:	\$30,000
Net Annual Cost Avoidance:	\$41,214

## CM 11 VAV Air Handling Systems Retrofit/Optimization

**General Description & MV-Option Definition and Rationale:**

Purpose of CM is to increase the efficiency of the existing VAV systems, equipment and controls. This is accomplished by replacing the old inlet guide vanes and by-pass dampers with new VFD's and motors.

Capacities and performance indices of the modified systems are presented below in this M&V plan and in the CM Savings Calculations attached hereto and incorporated herein as Exhibit 2.

**Boundary of Energy Use and Cost Avoidance Determination:**

The energy cost avoidance determination for this CM is isolated to the retrofitted air handlers' use. All other existing or new equipment directly using energy are not accounted for in this energy analysis, including new equipment added under this contract or by others. Building and process loads are dependent on weather, occupancy, operational scheduling etc. All of these independent and dependent variables will not be monitored under a retrofit isolation M&V strategy to provide a cost-effective monitoring of the cost avoidance. This program will not monitor performance period changes in air handler unit load, new equipment capacity, or set-point/differential control values from baseline load, baseline roof top unit capacity, and baseline control values and thus the cost avoidance analysis will be normalized to baseline conditions. Honeywell will provide verification that the equipment installed are operating to the

specifications of the manufacturer and to the specifications projected in the proposal through the documentation records provided by the installer. Based on the measured efficiency specifications, projected energy savings will be calculated for the 1st year of the Guarantee Period. Other equipment and processes will not be monitored. Electrical or heating energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

**Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions**

**Baseline:** The energy performance baseline was determined on a utility bill basis. The energy use baselines are included in Exhibit 2. The baseline period dates are listed in Schedules C and H. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance as stipulated below. Operational performance baseline parameters are included and presented in Schedules C, H, I and J. Baseline parameters are stipulated as listed below:

**Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:**

There are no projected baseline adjustments for this CM. The Customer and Honeywell have agreed upon operational and energy baseline parameters.

**Potential-to-Save Verification Plan**

The verification of potential-to-save will be based on completion of the following;

- The Customer's sign-off of the Delivery & Acceptance certificate
- Verification of manufacturer's submittal specifications compared to the calculations
- Verification of factory start up reports compared to the calculations
- Potential-to-save verification will be determined based on efficiency improvements.

CM	Method	Parameter Type	Parameter	Baseline	Post Installation	Regular Interval
VAV Air Handling Retrofit	Option A	Operational Performance	Manufacturer's submittal datasheets VFD efficiency Installation documents	Based on computer model		Monitoring through year 15
VAV Air Handling Retrofit	Option A	Energy Savings	Improved Efficiency indicates reduced energy consumption	Baseline Energy Consumption Data from computer model		Monitoring through year 15

CM-11: VAV Air Handling Retrofit	
Annual Energy Cost Avoidance:	\$4,344
Annual O&M Cost Avoidance:	\$0
Net Annual Cost Avoidance:	\$4,344

**Parameters to be Monitored & Sampling Plan**

<u>Point</u>	<u>Engineering Units</u>	<u>Interval</u>
AC Command	On/Off	15 min.
VFD Power	kW	15 min
VFD Power	Kwh	15 min.

Proposal Period: No data logging or spot measurements were conducted.

Pre-Installation & Baseline Verification: No data logging or spot measurements will be conducted.

Installation & Acceptance Period: Installation documents used to verify operating parameters of AC units to match projected and manufacturer specifications.

Performance Period (On-Going): Data trending will be conducted during year 1. A walk-through on an annual basis to observe general conditions of operation and perception of mechanical conditions will be conducted.

**Determination of Energy & Cost Avoidance**

Energy cost savings for this measure are achieved through improvement of the air handler unit efficiency. Cost savings is energy unit savings times cost of energy per unit.

In case of Cost Avoidance shortfall, Honeywell will be allowed to remedy and verify successful performance.

**Determination of Non-Energy O&M Cost Impact**

No O&M savings were identified

**Customer Responsibilities and Honeywell-Customer Risk Allocation**

The guarantee is contingent on the Customer successfully fulfilling the following tasks:

- Providing or cause to provide on-going maintenance and repairs as is deemed necessary relative to factory specifications, continuous operation to the efficiency levels indicated in the energy calculations, and to specifications indicated, referenced, and included herein.
- Maintain post retrofit status of building components relative to this CM (i.e., occupancy level and use, hours of operation, maintenance, etc.
- Responsibilities as delineated in Schedule C, F, I, J and K

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Option B CM's will quantify energy and cost avoidance based on measured data and verification activities, plus the identified unit cost escalation. Customer is responsible to provide Honeywell with notification of changes that would impact the baseline of this CM. Honeywell is allowed to make baseline appropriate modifications to reflect observed changes in usage that impact the energy baseline.

**Performance Period Definition and On-Going Activities**

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as indicated.

**Reports & Documentation**

Same as CM#1.

CM-11: VAV Air Handling Retrofit	
Annual Energy Cost Avoidance:	\$4,344
Annual O&M Cost Avoidance:	\$0
Net Annual Cost Avoidance:	\$4,344

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EMS	
Annual Energy Cost Avoidance:	\$45,605
Annual O&M Cost Avoidance:	\$11,094
Net Annual Cost Avoidance:	\$56,699

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### CM#16 - Street Lighting Retrofit

#### General Description & MV-Option Definition and Rationale:

The purpose of this CM is to improve energy efficiency in street lighting systems. Energy avoidance will be measured through the use of Option A.

#### .Boundary of Energy Use and Cost Avoidance Determination:

The energy cost avoidance determination for this CM is isolated to the lighting system retrofit. A retrofit isolation approach (option A) was selected to determine the energy unit displacement and cost avoidance. This method was selected for the street lighting retrofits. This is a cost effective approach providing an acceptable balance between the costs of doing M&V versus the quantity of projected Cost Avoidance. This method analyzes energy use within the isolated boundary of this particular CM retrofit and not as a whole at the utility meter. This retrofit isolation approach, thus avoids the time and expense necessary to track on-site changes that effect electrical use as seen at the electric utility meter that are not related to this CM. Honeywell will provide verification that the street lighting systems installed are operating to the specifications of the manufacturer and to the specifications projected in this Contract through the documentation records provided by the installer.

Other equipment & processes will not be monitored. Electrical energy is not monitored as part of this program. Utility bill accounting and auditing is not included, and if desired can be provided at extra cost.

Baseline: Conditions & Energy/Water Data AND Planned & Unplanned Baseline Adjustment Conditions  
 Baseline: The energy performance baseline was determined from existing systems manufacturer's performance specifications; the energy use baselines are included in Schedules F, H, and I. The baseline period dates are listed in Schedule C. The baseline unit cost energy is based on the most recent rates paid by the Customer and will be considered to be the value of unit cost avoidance. Operational performance baseline parameters are included and presented in Schedules F, H, and I.

#### Planned and Unplanned (Routine and Non-Routine) Baseline Adjustments:

There are no projected baseline adjustments for this CM. The Customer and Honeywell have stipulated to and agreed upon operational and energy baseline parameters.

#### Potential-to-Save Verification Plan

The verification of potential-to-save will be based on completion of the following;  
 Measurement and verification for this CM will be accomplished with Pre and Post installation.

measurements of the power draw for a representative sample of each type of fixture. The annual operating hours for each fixture will be stipulated.

#### Parameters to be Monitored & Sampling Plan

General: The measured parameter is limited to fixture amperage for a sample population of fixtures. Fixture quantity and types will be confirmed through contractor documentation. All other operating parameters including run time hours are stipulated and agreed upon.

Installation & Acceptance Period: The sampling methodology will utilize measurements taken on switches or breakers. These measurements include 5% of fixtures per technology type (lamp and ballast combinations) that comprise 80% of the lighting Conservation Measures (CM) kW reduction. Operational parameters (hours) will be stipulated.

Performance Period (On-Going): There will be no on-going measurements of fixture amperage for this CM. The on-going measurement will be limited to review of equipment maintenance records and operating conditions as presented by customer representatives during routine site visits by Honeywell M&V personnel

#### Determination of Energy & Cost Avoidance

Energy cost savings for this measure are achieved through improvement of the lighting fixture efficiency.

The determination of Cost Avoidance will utilize the following baseline – actual formula:

Pre retrofit fixture kWh \* hours \* unit cost  
Minus

Post retrofit fixture kWh\* hours\* unit cost.

The monitoring and sampling plan results will confirm fixture amperage by fixture type. Utility unit costs will be evaluated based on utility rate analysis. All other operating parameters (including hours) used in avoidance calculations are agreed upon and stipulated for the duration of the performance period.

#### Determination of Non-Energy Operational Cost Impact

Invoice and Internal Work Order records provided by the city will be used to identify the pre-retrofit operational costs associated with this CM. Post-retrofit avoided costs are projected based on the inclusion of reductions in lighting related labor activities required to maintain ageing equipment, and reduction in lighting related material purchases required to maintain ageing equipment. Operational savings are based on the following agreed upon concepts;

The operational cost savings are deemed satisfied upon contract execution. The Customer acknowledges and agrees that, if it did not enter into this Contract, it would have to take future steps to achieve the same ends as does the work included in Schedule A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented in the Schedule of Savings. The Customer agrees that, by entering into this Contract, it will avoid future operational costs in at least these amounts.

#### Customer Responsibilities and Honeywell-Customer Risk Allocation

Customer Responsibilities: The guarantee is contingent on the Customer successfully fulfilling the following tasks:

Maintain post retrofit status of street light components relative to this CM (i.e., occupancy level and use, hours of operation, etc.)

Responsibilities as delineated in Schedules C, F, I, J and K.

Honeywell Risk Allocation: Successful guarantee performance is determined by meeting the avoidance presented herein. Honeywell will measure to confirm that the capacity to perform (fixture kW, etc.) has been achieved. Honeywell will confirm through contractor records that the quantity of retrofit fixtures

proposed has been installed. Honeywell and customer agree that the on-going performance and operation (hours of use, maintenance, etc.) are stipulated and agreed upon and are the responsibility of and under the control of the customer.

Performance Period Definition and On-Going Activities

Performance Period Definition: The performance period term overall is 15 years.

On-Going Activities: Annual measurement and verification as defined above.