Investment Grade Audit

City of Punta Gorda

Florida

August 15, 2013

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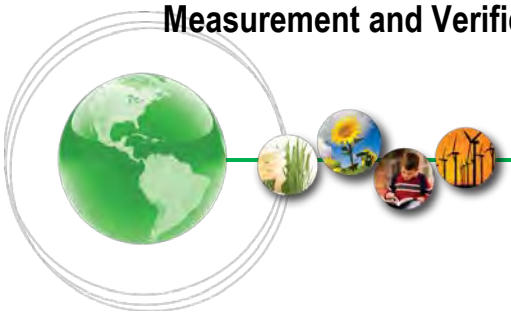

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Executive Summary

Investment Grade Audit (IGA)

Background

BGA, Inc., a ConEdison *Solutions* Company (ConEdison *Solutions*), is a Florida based business (since 1986) with a national footprint that specializes in analyzing, engineering and implementing energy conservation projects.

As one of ten approved Florida State Term Performance Contractors, the ConEdison *Solutions* Florida office has an extensive staff of energy and engineering professionals that includes the credentials of licensed professional engineers, licensed general contractors, licensed mechanical contractors, Certified Energy Managers, and Certified Lighting Efficiency Professionals.

Following an extensive selection process by the City of Punta Gorda. ConEdison *Solutions* was chosen to perform the Investment Grade Audit (IGA) for the City with the goal of developing an Energy Services Performance Contract (ESPC) for the City.

Beginning in 2012, ConEdison's team targeted and surveyed sixteen (16) City facilities, including a number of parks, for in depth energy analysis.

IGA Findings

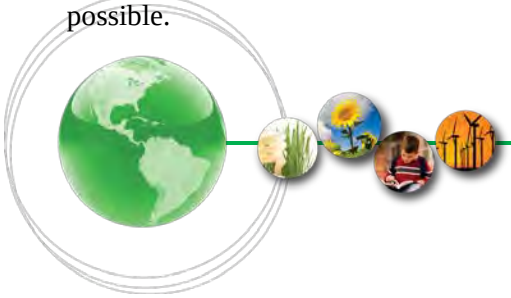
After confirming known opportunities and identifying additional opportunities during its extensive auditing process, ConEdison *Solutions* has developed and prepared this IGA document for the City of Punta Gorda.

The bottom-line objective of this IGA was to define a turnkey Project, with guaranteed costs and savings, that is composed of Energy Conservation Measures (ECMs) that in sum will generate the energy and operational cost savings necessary to fund the Project; ConEdison Solutions proudly represents this IGA as having achieved that objective.

The self funding scope of work that is defined herein will result in significant upgrades of the City's energy consuming equipment/assets while at the same time significantly reducing the City's utility and operating costs.

This IGA, its defined Project, and the resulting savings over the term of the Energy Services Performance Contract will be sufficient to completely fund the entire turnkey Project using a municipal capital lease financing instrument, thereby satisfying the enabling legislation contained in Florida Statutes 489.145.

This IGA is now ready for integration into an Energy Saving Performance Contract (ESPC) as outlined in the aforementioned legislation. ConEdison *Solutions* stands ready to assist the City to prepare and execute the contract in a timely manner so as to accelerate the attainment of the financial benefits of the Project as soon as possible.



Energy Conservation Measures (ECMs) identified by ConEdison *Solutions* as applicable to the City's facilities surveyed as part of this IGA included:

- ✓ **Building Lighting System Improvements and Occupancy Controls**
- ✓ **Parking Lot Lighting Improvements**
- ✓ **Street Lighting Improvements**
- ✓ **Mechanical Equipment Upgrades**
- ✓ **Energy Management Control System Upgrades**
- ✓ **Vending Machine Controls**
- ✓ **Ice Machine Heat Exchangers**

These ECMs are identified and defined in much greater detail in the balance of this document, and a summary table of them may be found on in the Financial Analysis section of this report which indentifies all costs, savings and individual ECM payback periods.

The Project is made feasible by combining quicker payback Energy Conservation Measures (ECMs) (primarily the street lighting and controlled building lighting upgrades) with longer payback ECMs (such as Energy Management upgrades which will enhance comfort as well as reduce energy and operating costs).

Not only will these upgrades augment the City's ongoing energy efficiency improvement programs, they will reduce the City's future capital needs and liabilities by replacing antiquated equipment which has reached, or is about to reach, the end of its useful life with new, under warranty, equipment.

Replacing aged equipment with higher efficiency equivalents using a Performance Contract will provide financial flexibility for the City and its Leadership by greatly reducing the need to earmark further capital dollars for those replacements over the next 10 to 20 years.

The IGA Process

All of the City's energy and water consuming systems were analyzed in detail including, but not limited to the following:

- ✓ **Lighting and Electrical Systems**
- ✓ **HVAC Systems**
- ✓ **Plumbing Systems**
- ✓ **Energy Management Systems**
- ✓ **Utility Use, Cost and Rate Analysis**

During the course of the IGA process ConEdison *Solutions* performed a significant and in-depth amount of field work research, engineering and design including:

- ✓ **Facility Auditing**
- ✓ **Building Energy Consumption Modeling**
- ✓ **Temperature and Humidity Data Logging**
- ✓ **CO^2 and Ventilation Analysis**

Much of the above data collection work and energy calculation documentation is published in the IGA's Appendices. Energy calculations were performed using specialized energy analysis software along with custom spreadsheets, and full descriptions of the methodologies and calculations for savings are outlined in the subsequent pages of this IGA.

The IGA process also involved extensive interviews by our team with personnel from several of the City's departments. Facilities personnel along with many others contributed to the extensive amount of data that was collected.

More importantly, these interactions also helped ConEdison *Solutions* to develop a greater understanding of building use and operations, and to become aware of known issues and occupant needs.

Development of Final Recommended Project

ConEdison *Solutions* utilizes a modeling tool called an Energy Conservation Measure (ECM) Master*Plan.* It is a dynamic tool that creates an easy to understand summary of the Project that is defined within this IGA.

All identified ECMs from the intial surveys and subsequent analysis were entered into the tool in order to allow the City's energy Committee to see, in real time, the effect of combining various ECMs and options, utility rate increases, inclusion/exclusion of O&M savings, among other factors.

This tool serves an important role and is utilized in a workshop environment with the City's staff and energy Committee representatives. The resulting process enables them to be actively involved in the evaluation of each and every potential ECM, and to exercise final judgment as whether to include or exclude any individual ECM.

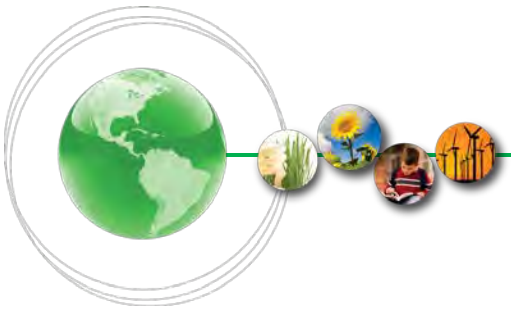
Some of the ECMs that ConEdison *Solutions* identified and evaluated were excluded as they were found to be less attractive investments than others and are identified in the section "ECMs Investigated But Not Included".

The project scope's Master*Plan* as defined by the City's Committee, and recommended by ConEdison *Solutions*, can be found in the Financial Analysis section.

Development of Additional Energy Savings Projects

There are two main areas to be considered as holding the potential for future development as economically attractive projects for the City are both within the Enterprise Funded Area of Utilities. One is pump and process efficiency measures that may be applicable at the Waste Water Treatment Plant. Development of such measures was considered beyond the scope of this Investment Grade Audit, as further engineering and detailed logging of flows would be required. The other area that holds the potential for significant financial benefit to the City is consideration of water meter fleet replacement and advanced metering infrastructure (AMI). This opportunity was also beyond the scope of the time frame and cost of this IGA, and is more fully elaborated upon in the section "ECMs To Be Considered For Additional Investigation".

If desired by the City, ConEdison *Solutions* is not opposed to further development of either or both of these projects once the Facilities focused areas that are the subject of this IGA have begun further implementation.



Facility Descriptions

ConEdison *Solutions* conducted comprehensive energy audits at all the City of Punta Gorda facilities in scope. This audit included surveys of each facility focused on mechanical systems, electrical systems, plumbing systems and building envelope. The aim of the audit was to establish the energy baseline for each building, determine how energy is currently being used, then identify and develop energy conservation measures which would reduce energy and operational expenditure while resulting in infrastructure improvement and a more comfortable work environment for staff and visitors.

City Hall

The City of Punta Gorda City Hall was built in 1927. It is a 7,032 square foot, two story building. It has a red brick facade exterior construction. The roof was last replaced in 2004. The building houses several key municipal government departments, such as city clerk and finance, and the City's Council Chamber is also located within this facility.

The building lighting system consists of 129 lighting fixtures comprising a mix of 2'x4' and 2'x2' linear fluorescent light fixtures fitted with both T8 and T12 linear fluorescent lamps which are predominantly used to illuminate office spaces and hallways. A number of recessed can fixtures that utilize a mixture of incandescent and compact fluorescent lamps are used for spot lighting as small spaces throughout the buildings. Exit signs were all LED. Decorative fixtures used at the interior entranceways were fitted with compact fluorescent lamps. Exterior lighting consisted of high intensity discharge (HID) high-pressure sodium fixtures, which provided night/security lighting around the perimeter of the building. A room by room count of fixtures and type is contained in Appendix A.

The plumbing fixtures located throughout bathrooms and break rooms were a mixture of standard flow and low flow fixtures. The bathrooms outside of the council chamber were retrofit with automatic infrared sensors, and all the remaining fixtures were manually controlled.

The mechanical systems for the building consist of nine (9) direct expansion (DX) split systems and one (1) packaged DX unit that serve individual areas within the space. A mixture of programmable and non-programmable thermostats located within each space controls each AC unit. Electric heaters are installed at each air handler to provide heating. The air distribution systems in each space are all constant volume systems.

A breakdown of the ten (10) aforementioned units is as follows:

- One (1) 10-ton multi-stage (2-stages) DX split system is the primary cooling unit for the Council Chamber. The air handler is located in an exterior accessed mechanical room, and is equipped with a duct heater.
- One (1) 2.5-ton DX split system serves the Council Chamber as a supplemental unit for periods of high occupancy.
- One (1) 15-ton multi-stage (2 stages) DX split system serves the majority of the building (1st & 2nd floor). This unit is equipped with a duct mounted electric heater.
- The remaining seven (7) DX system range in size from 2-ton to 3.5-ton and serve small office areas throughout the building.

City Hall- Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
City Hall- Council Chamber	Trane/Tempstar Multi-Stage DX Split	2A7M03060 CA5060UKA2	10 tons (5-ton each condenser)
City Hall – Main Unit	Goodman/ICP Multi-Stage DX Split	GSC10090 CAE090	15 tons (7.5-ton each compressor)
City Hall- Council Chamber	Tempstar DX Split	CA9030VKD2	2.5-tons
City Hall- Chamber of Commerce	Payne DX Split	PA10JA030	2.5-tons
City Hall- City Clerk	Tempstar DX Split	CA9024UKC1	2-tons
City Hall- Break Rm	Tempstar DX Split	CA5024UKB1	2-tons
City Hall- Finance	Ruud DX Split	UAMB030JAZ	2.5-ton
City Hall- Hallway	Tempstar DX Split	CA5042UKB1	3.5-ton
City Hall- Booster	Carrier DX Split	24ABR324A310	2-ton
City Hall- Records	Trane DX Packaged	TCK042A100AB	3.5-ton

City Hall Annex

The City of Punta Gorda City Hall Annex was built in 1992. It is a 12,305 square foot, three story building. It has a red brick facade exterior construction to match the City Hall next door. The building houses several key municipal government departments. The first level of the building is mainly a covered parking garage, and an elevator lobby is also located on the first level to gain access to the main two floors. The second and third floor

of the building is made up of typical office space and houses several municipal departments.

The building lighting system consists of 308 lighting fixtures. The majority of the lighting system consists of 2'x4' recessed parabolic, linear T12 fixtures. Recessed compact fluorescent fixtures are used to illuminate a few areas. All exit signs are LED. The parking garage is lit with eighteen (18) 1'x4' vapor tight T12 fixtures. A room by room count of fixtures and type is contained in Appendix A.

The water closets and urinals were a mixture of standard flow and low flow fixtures. In some cases low consumption water closets had mismatched diaphragms installed rendering them to operate at high flow. Only a few faucets were equipped with low flow aerators, and the majority of bathrooms had standard faucets.

The mechanical systems for the building consist of ten (10) direct expansion (DX) split systems ranging in size from 2.5-ton to 7.5-ton. The condensing units are all located on an elevated mechanical pad on the north side of the building. Air handling units are all located within individual mechanical closets within the building.

Programmable thermostats are located within each space and control each AC unit. Electric heaters are installed at each air handler to provide heating. The air distribution systems in each space are all constant volume systems.

A 2.5-ton Mitsubishi Computer Room Air Conditioner (CRAC-1) and a 3-ton Fujitsu Inverter unit (CRAC-2) serves the Information Technology server room on the third floor of the building.

City Hall Annex- Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
CH Annex- Unit 1	Trane DX Split	TTD748B100A2	4-tons
CH Annex- Unit 2	Trane DX Split	TTD760B100A2	5-tons
CH Annex- Unit 3	Trane DX Split	TTA090A300AA	7.5-tons
CH Annex- Unit 4	Trane DX Split	TTA090D3000	7.5-tons
CH Annex- Unit 5	Trane DX Split	TTD760B100A2	5-tons
CH Annex- Unit 6	Rheem DX Split	RAWL090CAZ	7.5-tons
CH Annex- Unit 7	Trane DX Split	TTD742B100A0	3.5-tons
CH Annex- Unit 8	American Standard DX Split	2A7A1060A1000AA	5-tons
CH Annex- Unit 9	Tempstar DX Split	CA5536VKD2	3-tons
CH Annex- Unit 10	Fedders DX Split	C30ABD1V	2.5-tons
CH Annex-CRAC 1	Mitsubishi CRAC unit	PUG30AYB	2.5-tons
CH Annex-CRAC 2	Fujitsu CRAC unit	AOU36CLX	3-tons

Freeman House

The Freeman House is a historic residential house. The Chamber of commerce currently occupies the home, while some portions of the house are used as a historic museum. It is a 3,546 square foot Victorian-style house that was relocated to its current site from its original location.

The lighting and plumbing fixtures inside the building are all from the Victorian-Era. Lighting is provided predominantly by candela-style lamps, and plumping fixtures are decorative porcelain. Due to the historic designation of this facility, it is not considered for lighting or plumbing upgrades.

The HVAC system for this facility consists of one (1) DX split system, which serves the upper level, and one (1) DX packaged unit, which serves the lower level of the home.

Freeman House- Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
Freeman House- Upper Level	American Standard DX Split	2A7B2030A1000AA	2.5-tons
Freeman House- Lower Level	Trane DX Split	TCK042A100BA	3.5-tons

Public Safety Building

The City of Punta Gorda Public Safety Building is a 19,533 square foot single story building, built in 2002. It houses the City's Police Department and Fire Department.

The lighting system within this facility consists of 320 fixtures, most of which are 2'x4' linear T8 lamps and recessed compact fluorescent fixtures. Exit signs within the building are all LED. A room by room count of fixtures and type is contained in Appendix A.

The plumbing system for this facility is comprised of all low consumption fixtures in restrooms, bathrooms and lavatories.

The mechanical system for this building is comprised of two (2) main multi-stage DX systems that serve the Fire Department and Police Department, respectively. Both systems are interconnected by a common energy recovery ventilator (ERV-1), which feeds both air-handling units.

The Police Department system consists of one (1) 12.5-ton condensing unit, which serves the outside air coil of AHU-1, and one (1) 15-ton condensing unit, which serves the return air coil on AHU-1. AHU-1 is a dual–path, variable air volume air handling unit with dedicated outside air path. The supply fan motor is equipped with a variable frequency drive.

The Fire Department system consists of one (1) 5-ton condensing unit, which serves the outside air coil of AHU-2, and one (1) 10-ton condensing unit, which serves the return air coil on AHU-2. AHU-1 is a dual –path, variable air volume air handling unit with dedicated outside air path. The supply fan motor is equipped with a variable frequency drive. A 3400-cfm energy recovery ventilator is interconnected to both AHUs to pre-treat incoming air to the outside air path of both units. A variable air volume (VAV) air distribution system consisting of fourteen (14) VAV boxes with electric reheat serves the entire building.

One (1) 3.5-ton DX fan coil unit and one (1) 3.0 –ton DX mini-split HVAC unit is installed in the 9-1-1 Area for redundancy. A Microsoft DOS based Invensys DDC system controls the entire system. The system is configured to operate in occupied mode 24/7 to match the buildings occupancy.

A smaller, remote building is located at the rear of the compound that houses a storage unit and small gym. This facility is served by a 12,000 Btu window air conditioner and a 2-ton DX split system.

Public Safety- Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
Public Safety- Police Dept. CU-1	Carrier DX Condensing Unit	38AKS014	12.5-tons
Public Safety- Police Dept. CU-2	Carrier DX Condensing Unit	38AKS016	15-tons
Public Safety- Fire Dept. CU-3	Goodman DX Condensing Unit	GSC13060	5-tons
Public Safety- Fire Dept. CU-4	Carrier DX Condensing Unit	38ARS012	10-tons
Public Safety- 9-1-1 CU-5	Carrier DX Condensing Unit	38CK042	3.5-tons
Public Safety- Police Dept AHU-1	Temtrol Dual Path VAV AHU	WFDH-19	MBtuH: 165RA* 135OA*; 10 hp
Public Safety- Fire Dept. AHU-1	Temtrol Dual Path VAV AHU	WFDH-10	MBtuH:109RA; 50OA; 7.5 hp
Public Safety- 9-1-1 FCU-1	Carrier Fan Coil Unit	Unknown	MBtuH: 38.2; 1500 cfm; 0.75 hp
Public Safety- Gym/ Storage	Rheem DX Split	RAMC024JAZ	2-tons
Public Safety- Gym/ Storage	LG Window Air Conditioner	6DEX1690	12000 Btus

**RA=Return Air; OA= Outside Air*

Fire Station #2

Fire Station #2 is a 2,986 square feet single story facility built in 2008. It has masonry stucco finish with pitched roofing.

The lighting system for this fire station is comprised of 47 fixtures. A room by room count of fixtures and type is contained in Appendix A.

The truck bay is lit by 275W high intensity discharge metal halide fixtures as well as 1'x4' linear fluorescent vapor tight fixtures. The interior of the building is lit by 2'x4' and 1'x4' linear fluorescent recessed fixtures. Compact fluorescent can fixtures were also observed within living areas. Exterior grounds lighting is provided by high intensity discharge metal halide fixtures. All plumbing fixtures are low consumption type. Domestic hot water is provided by a 75,000 Btu/hr propane water heater.

The mechanical system for the facility is comprised of three (3) DX split systems. The condensing units are located on a mechanical terrace at the rear of the building. The air handling units are located inside mechanical room and feed constant air volume to the air distribution system. Programmable thermostats control all three units. However, these thermostats are not programmed as the building is occupied 24/7.

Fire Station # 2- Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
Fire Station # 2	Trane DX Split	2TTB3060A1000	5-tons
Fire Station # 2	Trane DX Split	2TTB3060A1000	5-tons
Fire Station # 2	Trane DX Split	2TTB3024A1000	2-tons

Fire Station #3

Fire Station #3 is a 2,821 square foot, two-story building, built in 2000.

The lighting system for this fire station is comprised of 60 fixtures. All the lighting in the facility is fluorescent lighting. T8 fixtures are located in the truck bay as well as the interior of the facility. Compact fluorescent lighting is also used for spot lighting in the living areas. A room by room count of fixtures and type is contained in Appendix A.

Plumbing fixtures within the building are all low flow.

The mechanical system for the facility is comprised of three (3) DX split systems. The condensing units are located on an elevated mechanical pad at the side of the building. The air-handling units are located inside mechanical room and feed constant air volume to the air distribution system. Non-programmable thermostats control all three units. The units run 24/7 in accordance with its occupancy.

Fire Station # 3- Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
Fire Station # 3- Gym	Trane DX Split	TTP018C100A3	1.5-tons
Fire Station # 3- Living Area	Ameristar DX Split	2A6M3048A1000	4-tons
Fire Station # 3- Chief's Office	Trane DX Split	TWP042C100A4	3.5-tons

Public Works/Utilities Campus

The Public Works/Utilities Campus has two main buildings approximately 27,000 square feet each consisting of mixed-use office condos. The facility is a concrete wall structure with a flat metal roof. Building 3130 houses the City's Public Works Department, while Building 3132 houses the City's Utilities Department with approximately 60% of the space utilized as offices and the remaining 40% used for storage and work bays. The campus serves as storage for the City's equipment and materials used in daily activities associated with the City's operations and maintenance.

The lighting system throughout both buildings is relatively similar, comprised of 194 fixtures in the Public Works Building and 244 fixtures in the Utilities Building. Linear fluorescent lighting is used predominantly in the office spaces with compact fluorescent deployed is strategic areas to meet the illumination requirements of the space. All exits sign are LED. A room by room count of fixtures and type is contained in Appendix A.

The plumbing fixtures in both buildings are all low flow technology.

The mechanical systems for the Public Works Building consist of thirteen (13) DX split systems. The Utilities Building is served by seven (7) DX split systems. The condensing units are all located on the roof, while vertical air handling units are located above the drop ceiling within the space. All AHUs serve constant volume air distribution systems. A combination of programmable and non-programmable thermostats control these units

Public Works/ Utilities- Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
Public Works- 101	Goodman DX Split	GSC130301AE	2.5-tons
Public Works- 101	Trane DX Split	4TTA3060A3000BA	5-tons
Public Works- 102	Trane DX Split	4TTB3042C1000AA	3.5-tons
Public Works- 102	Goodman DX Split	GSC130301AE	2.5-tons
Public Works- 103	Goodman DX Split	GSC130241AE	2-tons
Public Works- 104	Goodman DX Split	GSC130241AE	2-tons
Public Works- 105	Goodman DX Split	GSC130301AE	2.5-tons
Public Works- 105	Trane DX Split	4TTB3024A1000BA	2-tons
Public Works- 106	Goodman DX Split	GSC130241AE	2-tons
Public Works- 107	Goodman DX Split	GSC130241AE	2-tons
Public Works- 108	Goodman DX Split	GSC130241AE	2-tons
Public Works- 109	Goodman DX Split	GSC130241AE	2-tons
Public Works- 110	Goodman DX Split	GSC130301AE	2-tons
Utilities- 201	Goodman DX Split	GSC130301AE	2.5-tons
Utilities- 201	Trane DX Split	4TTA3048A3000BA	4-tons
Utilities- 201	Trane DX Split	4TTB3036B1000BA	3-tons
Utilities- 208	Goodman DX Split	GSC130301AE	2.5-tons
Utilities- 208	Trane DX Split	4TTB3024A1000BA	2-tons
Utilities- 209	Goodman DX Split	GSC130301AE	2.5-tons
Utilities- 216	Goodman DX Split	GSC130301AE	2.5-tons

Laishley Park Marina

Laishley Park is located along the Charlotte Harbor. It is a picturesque park, which includes 85 boat slips, an interactive fountain, recreational areas, and a restaurant a main marina building. Our audit focused on the marina building and park lighting. The marina building is located at the southwest end of the property and houses a large day room, bathrooms, showers and laundry facilities available to boaters that utilize the boat slips. A large community room and the marina office make up the remainder of this facility.

Lighting systems within the building consist of a mixture of high efficiency T5 fluorescent fixtures and compact fluorescents in recessed lighting. Due to the existing high efficiency lighting already in place, no energy savings opportunities were available, therefore there was no lighting audit performed for this building.

All plumbing equipment utilized low flow technology.

The mechanical systems which serve the buildings consist of five (5) DX split systems. The condensing units are all located on the roof of the facility, while the air handling units are located in a mechanical mezzanine above the occupied space. The AHUs all feed constant air volume air distribution systems. The units are controlled by programmable thermostats.

Laishley Park Marina Building- Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
Laishley Park	Trane DX Split	2TTA0048A3000AA	4-tons
Laishley Park	Trane DX Split	2TTA0060A3000AA	5-tons
Laishley Park	Trane DX Split	2TTA0048A3000AA	4-tons
Laishley Park	Rheem DX Split	13AJA42A01	3.5-tons
Laishley Park	Rheem DX Split	13AJA42A01	3.5-tons

Herald Street Parking Garage

Herald Street Parking Garage is a four story parking garage structure which sits on approximately 1.16 acres of land. The garage has a total capacity of 400 cars. There are also store front tenant spaces available at the property.

The parking garage lighting system consists of one hundred and twenty-seven (127) high intensity discharge metal halide surface mounted garage fixtures and eight (8) high intensity discharge metal halide pole-mounted shoebox fixtures on the roof of the facility.

Cooper Street Recreation Center

The Cooper Street Recreation Center is a 7,029 square foot, single story concrete building. A new addition was added to the original structure in 2008. The facility houses classrooms, offices, a library, computer lab, recreation room and a full kitchen.

The lighting systems for this facility consist mostly of T5 linear fluorescent lamps. Compact fluorescents and incandescent lamps are also used for illumination within the space. Due to the existing high efficiency lighting already in place, no energy savings opportunities were available, therefore there was no lighting audit performed for this building.

Plumbing systems within the facility include a variety of low flow and standard flow technology.

The mechanical systems for the facility can be divided into two areas. The original building consists of five (5) rooftop DX packaged units which serve constant volume air distribution systems. Programmable thermostats are used to control these packaged units. The mechanical systems which serve the new addition portion of the building consists of three (3) DX split systems and a 100% outside air unit. At the time of our audit the 100% outside air unit was not in service and did not appear to have ever been commissioned form its original installation. These units are all controlled by programmable thermostats.

Cooper Street Recreation Center - Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
Cooper Street Recreation Center- Old section	Tempstar Packaged DX Unit	PAF036K000E	3-ton
Cooper Street Recreation Center- Old section	Tempstar Packaged DX Unit	PAF036K000E	3-ton
Cooper Street Recreation Center- Old section	Tempstar Packaged DX Unit	PAF036K000E	3-ton
Cooper Street Recreation Center- Old section	Tempstar Packaged DX Unit	PAF036K000E	3-ton
Cooper Street Recreation Center- Old section	Tempstar Packaged DX Unit	PAF036K000E	3-ton
Cooper Street Recreation Center- New section	Carrier DX Split	24ACB324A300	2-ton
Cooper Street Recreation Center- New section	Carrier DX Split	24ACB324A300	2-ton

Cooper Street Recreation Center- New section	Carrier DX Split	24ACB324A300	2-ton
Cooper Street Recreation Center- New section	Addison 100% Outside Air Unit	RCA101A0001FOKO	1400cfm 107,500 Btu/hr

Bayfront Center

Bayfront Center is 7,131 square foot single story facility located right on the Charlotte Harbor. The building is a city-owned, leased facility. The building consists of office spaces, classrooms, a kitchen and a large community room used for rentals.

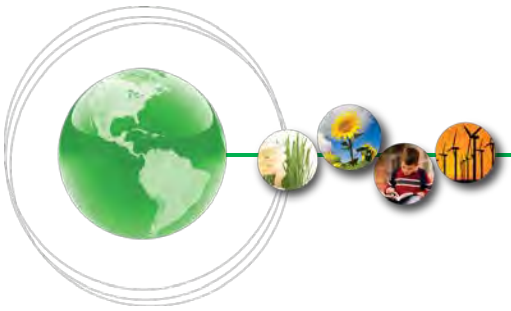
The lighting for this facility consists mostly of high efficiency 4'x2' linear T5 fluorescent fixtures. Compact fluorescents are also utilized throughout the space. Due to the existing high efficiency lighting already in place, no energy savings opportunities were available, therefore there was no lighting audit performed for this building.

Plumbing fixtures in the restrooms and kitchen were a mixture of low flow and standard flow technology.

The mechanical systems for this building consist of four (4) packaged DX rooftop systems and three (3) DX split systems. The units are controlled by a mixture of programmable and non- programmable thermostats. All four RTUs serve a common zone (large community room), while the three split systems serve small areas of the facility.

Bayfront Center - Mechanical Equipment List

Location	Equipment Type	Model Number	Capacity
Bayfront Center- Community Room	Carrier Packaged DX Unit	50TM006A301	5-ton
Bayfront Center- Community Room	Carrier Packaged DX Unit	50TM006A301	5-ton
Bayfront Center- Community Room	Carrier Packaged DX Unit	50TM006A301	5-ton
Bayfront Center- Community Room	Carrier Packaged DX Unit	50TM006A301	5-ton
Bayfront Center- Scouts Room	Rheem DX Split	RAKA036JAZ	3-ton
Bayfront Center- Boat Club	Rheem DX Split	RAKA024JAZ	2-ton
Bayfront Center- Kitchen	Tempstar DX Split	CA9030VKD1	2.5-ton



Baseline Analysis

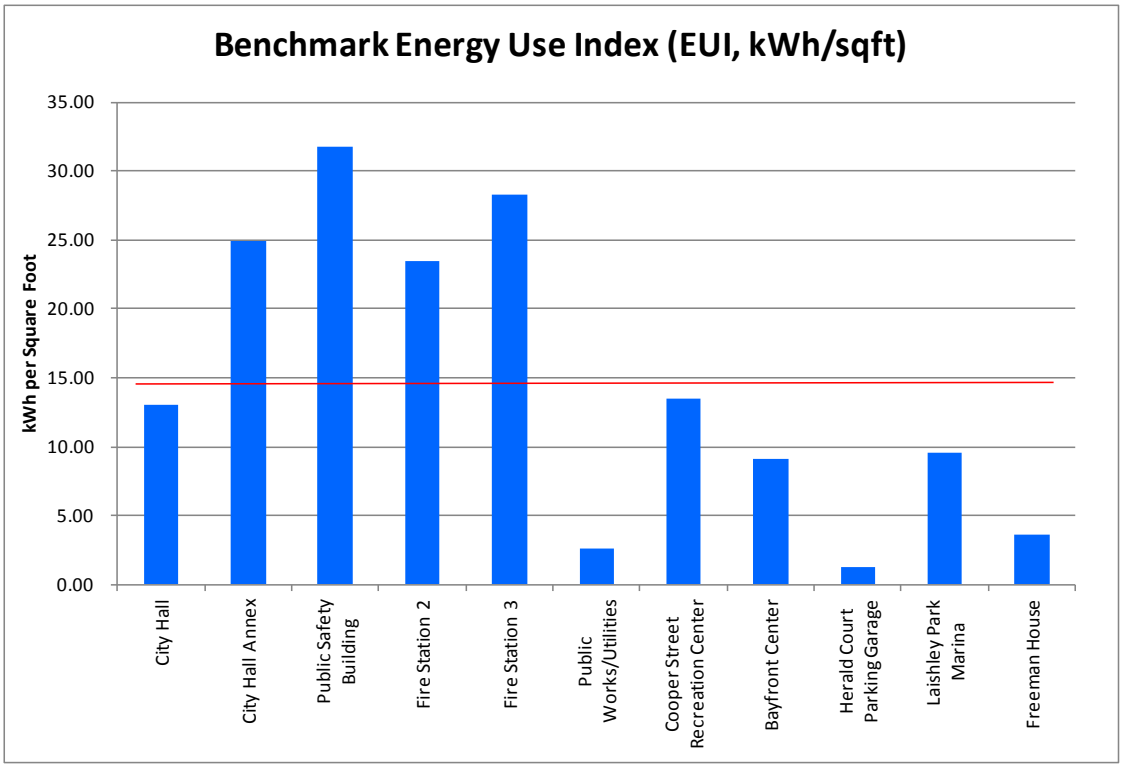
ConEdison *Solutions* engineers analyzed the utility bill information provided to establish a baseline energy consumption and to calibrate computer energy models used to analyze ECMs. Electricity is provided to each facility by Florida Power & Light. Smaller facilities are not billed for demand kW consumption. The larger facilities are billed a demand rate of $10.70 per kW.

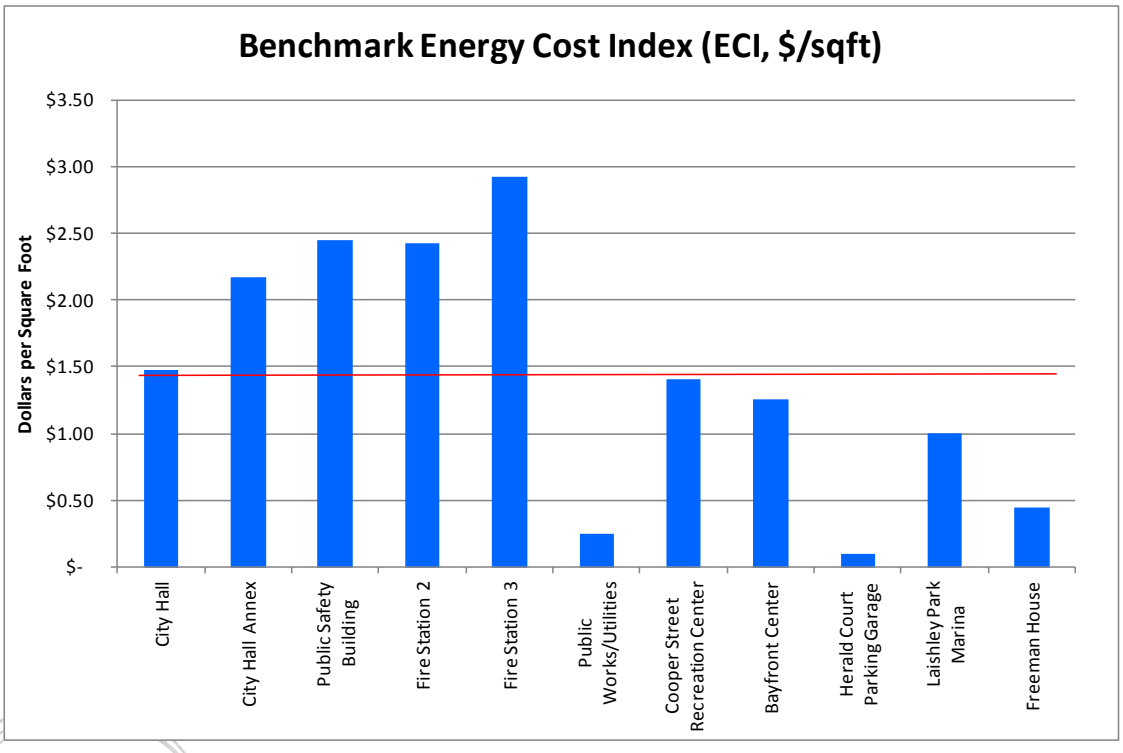
The chart below summarizes the Utility Data for the facilities audited. The last column of data is the average cost per kWh for the 12 months of billing data provided.

Location	Gross Square Footage	Annual Electricity			EUI kWh/sf	ECI $/sf	Cost $/kWh
		Consumed (kWh)	Demand (kW)	Cost			
City Hall	7,032	91948	37	$ 10,359	13.08	$ 1.47	$ 0.11
City Hall Annex	12,305	306540	68	$ 26,756	24.91	$ 2.17	$ 0.09
Public Safety Building	19,533	619920	91	$ 47,729	31.74	$ 2.44	$ 0.08
Fire Station 2	2,986	69958	15	$ 7,227	23.43	$ 2.42	$ 0.10
Fire Station 3	2,821	79651	16	$ 8,235	28.24	$ 2.92	$ 0.10
Public Works/Utilities*	54,000	138899	37	$ 13,150	2.57	$ 0.24	$ 0.09
Cooper Street Recreation Center	7,029	95075	32	$ 9,918	13.53	$ 1.41	$ 0.10
Bayfront Center	7,131	64970	34	$ 8,922	9.11	$ 1.25	$ 0.13
Herald Court Parking Garage*	191,900	249360	37	$ 19,451	1.30	$ 0.10	$ 0.08
Laishley Park Marina*	7,500	71572	NA	$ 7,496	9.54	$ 1.00	$ 0.10
Freeman House	3,546	12658	NA	$ 1,596	3.57	$ 0.45	$ 0.12
Totals	**312,237**	**1,800,551**	**367**	$ 160,840	**14.64**	**1.44**	$ 0.09

* Area estimated from available drawings and/or Google Earth measurements

The two indices used by ConEdison *Solutions* to evaluate a facility's energy use are the Energy Use Index (EUI) measuring energy consumption per square foot and the Energy Cost Index (ECI) measuring the energy cost per square foot. The EUI and ECI are used to benchmark the facilities against each other and similar buildings. The charts below represent the EUI and ECI of each audited building.


Benchmark Energy Use Index (EUI, kWh/sqft)
kWh per Square Foot
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
City Hall
City Hall Annex
Public Safety Building
Fire Station 2
Fire Station 3
Public Works/Utilities
Cooper Street Recreation Center
Bayfront Center
Herald Court Parking Garage
Laishley Park Marina
Freeman House


Benchmark Energy Cost Index (ECI, $/sqft)
Dollars per Square Foot
$3.50
$3.00
$2.50
$2.00
$1.50
$1.00
$0.50
$-
City Hall
City Hall Annex
Public Safety Building
Fire Station 2
Fire Station 3
Public Works/Utilities
Cooper Street Recreation Center
Bayfront Center
Herald Court Parking Garage
Laishley Park Marina
Freeman House

Methodology

ConEdison *Solutions* brings many years of experience working in a variety of facility types. This experience gives ConEdison *Solutions* a working knowledge of building systems and energy consuming equipment and technologies, and moreover enables ConEdison *Solutions* to benchmark existing operations and develop energy costs comparisons to similar facilities. During the IGA phase, ConEdison *Solutions* uses historical energy consumption and utility data from each facility to develop an overall understanding of the building's existing energy consumption patterns throughout the year. Our project engineers use detailed utility and demand data along with comprehensive equipment inventories and operational information to develop an in-depth understanding of building energy usage, with the ultimate goal of reconciling engineering estimates with actual utility bills.

During this process, ConEdison *Solutions* conducted detailed interviews with facility personnel and reviewed operations, maintenance, and repair logs. We reviewed information and trend data from building energy management systems (if any), and collected our own spot and trend meter data on specific end-use equipment to verify information provided or fill in areas where information was lacking. ConEdison *Solutions* also collected information on space condition parameters such as occupancy, temperature, and humidity by means of spot measurement and placement of data loggers over periods of up to several weeks.

It is important to develop an accurate model of energy use. When appropriate we use high-level engineering modeling programs such as DOE-2, TRANE TRACE, Carrier HAP, or accepted engineering techniques such as block load calculations to develop an understanding of energy use which will form the project's energy baseline. The energy baseline is presented to the customer for review and approval, as it forms the basis for savings calculations, and overall project performance which is confirmed through M&V.

The baseline energy model takes into account typical thirty-year weather patterns to predict estimated average energy performance and this data is used to calibrate the model to actual utility bills, with adjustments for unusually cold or hot weather encountered during the base year's utility bill period.

Once the energy baseline is established, the engineering and project development process focuses on identifying the energy efficiency opportunities and performing the engineering and design analysis which will determine the projected savings. After electric, fuel, and water savings have been determined through calculations, the commodity price is applied to determine the dollar savings. The initial commodity price is established through review of rate schedules and baseline analysis of electricity, fuels, water, and sewer charges. To determine future energy commodity prices, escalation factors such as a flat percentage escalation rate or nationally-recognized governmental energy price predictions are applied. The current commodity prices are used for the baseline year and then adjusted thereafter with the escalation factors over the life of the project.

Procedures and Methodologies to Calculate Savings

The procedures, formulas and methodologies described in this section are representative of the standard approach to measuring savings.

Data Gathering

ConEdison *Solutions* uses the following data and methods to gather information regarding existing building energy systems and conditions, and to identify and evaluate potential efficiency measures and develop general recommendations. As part of the site-audit and planning phase the following types of information were obtained and reviewed:

- General Facility Details
- Building Drawings – original design drawings and as-built drawings for the facilities were carefully studied.
- Utility Bills – This information is provided by the city and analyzed by ConEdison *Solutions*. Additional insight into the utility information was obtained through further organizing the data, researching the utility rate structures and through our building simulation modeling efforts.
- Temperature and Humidity Data Loggers – ConEdison *Solutions* deployed dozens of data loggers throughout typical rooms. These loggers were installed for approximately 2 weeks during a typical occupant period and the data was used to establish baselines for determining the effectiveness of temperature controls.
- List of HVAC Equipment – This was developed based on the mechanical schedules provided in the available drawing sets. The list was checked and verified using the notes taken during the site audit.
- List of Lighting Fixture Quantities and Types
- List of Water Fixtures Quantities and Types

The audit field team focused on major building systems including HVAC systems, lighting systems, energy management systems, building envelope, backup power systems, and specialty energy systems, including water fixtures. Of these, ConEdison *Solutions* focused on those areas that appear most promising: the audit concentrates on deriving projects and strategies that can be employed to reduce costs and improve building environments. Below is an explanation of the systems that were typically investigated and the corresponding information that was gathered:

HVAC Systems- The audit identified the type of cooling and heating systems used in the facility. The auditors identified and evaluated system control, size, capacity, effectiveness, age, and maintenance history. Equipment investigated in this section includes plant components such as:

- ✓ Water heaters
- ✓ HVAC systems
- ✓ Supply and return fan systems
- ✓ Variable and constant volume air systems
- ✓ Exhaust fan systems

Lighting Systems- The audit determined the variety of lighting systems that are in place in the facility. The auditors identified and evaluated system control, use, effectiveness, and age.

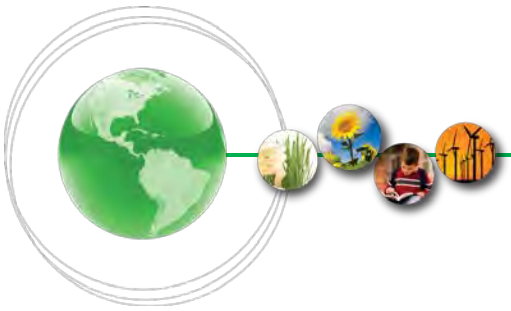
Water Systems- The audit identified the specific type of fixture, flush valve, sink aerator, and shower head to determine the typical flow quantity per use cycle.

General Facility Characteristics- Detailed interviews with operating personnel and extensive walk-throughs of each facility were done to create a comprehensive understanding of how energy is utilized in the facility during all weather conditions and occupancy periods.

Building Energy Simulations Techniques

Smaller, Less-complex Buildings: For smaller, less complex facilities and facilities where comprehensive as-built drawings are not available to allow computer modeling, the building's existing envelope, internal conditions and schedules, and energy-using systems are inputted into a custom-developed spreadsheet-based "bin model" energy simulation program.

Water and Equipment ECMs: Several efficiency measures, such as plumbing fixture upgrades, vending machine controls, ice machine upgrades, water heater upgrades, etc., are not affected by the weather and therefore do not require a building energy simulation program to calculate savings. The savings for these measures are typically calculated with spreadsheets using industry-standard methodology.



Energy Conservation Measure Descriptions

This section contains descriptions of the energy conservation measures and facility improvement measures that were evaluated in this IGA. From the baseline energy consumption, CES proposes specific Energy Conservation Measures (ECMs) to be implemented through a self-funded performance contract.

ECM 1.1: Interior Lighting Improvements and Controls

Description

ConEdison *Solutions* will install energy efficient lighting systems in all of the buildings requested by the City of Punta Gorda to greatly reduce energy consumption and maintenance costs. We also propose removing fixtures or de-lamping in areas that are currently over-lit. A room by room count of fixtures and type that will be affected is contained in Appendix A.

Proposed lighting upgrades include re-lamping the existing fluorescent fixtures with energy saving 28 Watt T-8 lamps and replacing ballasts with new low power electronic ballasts. The extended life of the new 28 watt T8 lamps will assist in not only the energy savings, but also significantly reduce the maintenance cost of the existing system. Existing inefficient T-12 fixtures will be re-lamped and re-ballasted with new T-8 lamps and electronic ballasts. Any existing incandescent lamps, if not controlled by a dimmer (for architectural aesthetic reasons) will be replaced with either a lighting emitting diode (LED) source or a compact fluorescent light source of equal lumen output (as close as possible due to size restraints of existing fixture).

ConEdison *Solutions* proposes to install controls to ensure that lighting does not operate unnecessarily. Examples of wasteful lighting situations are when a space is unoccupied or when there is ample daylight present. By installing a combination of occupancy sensors and daylight sensors, the overall energy wasted by unnecessary lighting will be substantially reduced. An example of an appropriate area for lighting control is defined as one that contains several controllable fixtures, has intermittent occupancy, and where a safety hazard will not be created if the sensor turns the lights off. Typical applications of occupancy sensors include wall switch replacement type sensors installed (where feasible) in smaller rooms (offices, storage, single use bathroom, etc) and ceiling mounted occupancy sensors installed (where feasible) in larger areas (open offices, classrooms, gang bathrooms, meeting/conference rooms, hallways, etc). Every effort will be made to maintain dual switching environments (checkerboard and in-board out-board lighting patterns; provide 50% lighting reduction). Mechanical twist type timers will be installed (where feasible) in utility spaces (electric, mechanical,

telephone, custodial, janitorial, storage rooms, etc…).

Even though some states have outright banned the manufacturing and sale of incandescent lighting fixtures, many City of Punta Gorda facilities have incandescent fixtures using 60 watt, 65 watt, or 100 watt lamps. *ConEdison Solutions* recommends replacing incandescent bulbs with dimmable and standard compact fluorescent (CFL) bulbs as appropriate. CFL lamps are also available in both a cooler (5500 Kelvin) color and a warmer (3500 Kelvin) color. The difference in light color can be seen in the adjacent photograph.

Savings Analysis

The potential savings of the proposed ECM1.1 - Interior Lighting Improvements and Controls are illustrated in the following table:

City of Punta Gorda Facilities Lighting Improvements and Controls							
ECM 1.1	Lighting Retrofit		Occupancy Sensors	HVAC Cooling	Estmated Energy	Maintenance	Total Annual
	kW Savings	kWh Savings	kWh Savings	kWh Savings	Savings*	Savings	Cost Savings
Interior Lighting Measures	42.3	109,213	28,384	17,486	$ 13,957.47	$ 2,098.53	$ 16,056.01
* Based on an average lighting utility rate of $0.09/kWh							

A guaranteed utility savings of 95% or $13,260 for Interior lighting upgrades are used in the ECM Master Plan for payback calculations. See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values. Additional savings calculation methods for ECM 1.1 are provided on the following page.

Savings Calculation Methodology

HVAC Savings Due to Lighting Retrofit

Included with the lighting savings is a calculation of the interactive savings associated with lighting. When the lighting watts are reduced, the amount of heat in the building is reduced. Therefore, in the summer months, air-conditioning loads are lowered. Conversely, in the winter months, heating loads are increased. The interactive calculation is based upon methodology published by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE). The following spreadsheet calculation was performed by ConEdison *Solutions* to show the interactive savings for the interior lighting retrofit.

A	B	C	D	E	F	G	H	I	J	K	L
	Lighting Savings		Cooling Savings				Heating Penalty				Net Savings
Department	kWh Reduced	Heat Gain to Space	Cooling Months	% of Space Cooled	Cooling System COP	Cooling Savings kWh	Heating Months	Fraction Area on Perimeter	Heating System Efficiency	Heating Penalty kWh	Total kWh
All City Bldgs - Interior	137,596	75%	10	85%	3.0	24,366	2	0.4	100%	(6,880)	155,082

Total kwh saved =	155,082
Cost per kwh =	$0.09
Saved Energy Cost =	$13,957

Notes	
A	Facility included in Audit
B	Interior Lighting Consumption Savings (kWh)
C	Fraction of lighting energy transmitted to conditioned space
D	Estimated length of cooling season (months) (Based on Bin Data)
E	Estimated percentage of space that is cooled
F	System mean coefficient of performance
G	Resulting cooling savings due to lighting upgrades = [colB] x [colC] x (colE) x ([colD] / 12) / [colF]
H	Estimated length of heating season (months) (Based on Bin Data)
I	Fraction Area of Perimeter (The fraction of floor area that is within 15 ft of a perimeter wall)
J	Estimated heating system efficiency (100% assumes electric heating)
K	Resulting heating penalty due to lighting upgrades (for electric heating) = [colB] x [colC] x [colI] x ([colH] / 12) / [colJ]
L	Net Savings (kWh) = [colB] + [colG] + [colK]

Lighting and Controls Savings

- Energy (kWh) savings is computed in the following manner:

  (FWE / 1000 x QFE x OHE) – (FWN / 1000 x QFN x OHN) = Savings in kWh

- The final kWh savings estimate is then multiplied by a stipulated utility energy rate of $0.09/kWh.

Where:
FWE = Fixture Rated Wattage – Existing
QFE = Quantity of Fixtures – Existing
OHE = Operating Hours – Existing
FWN = ECM Rated Wattage – New
QFN = Quantity of Fixtures – New
OHN = Operating Hours – New

The lighting audit information is provided in the appendix at the end of this report. Savings for any specific room can be verified by applying the numbers from the audit in the formula above.

Example: Assume that in a particular room, there are currently five 60-watt incandescent lamps. We propose replacing these light bulbs with five 23-watt compact fluorescent lamps. Based on observation data, the existing yearly operating hours for those lamps is 2,000 hours but the room is only occupied for 1,000 hours per year. The following is then true: QFE=5, FWE=60, QFN=5, FWN=23, OHE=2,000, OHN=1,000

Using the above formulas, the usage (h) and energy (kW) savings can be calculated for these fixtures.
Energy (kWh) savings = (FWE / 1000 x QFE x OHE) – (FWN / 1000 x QFN x OHN) = [((60 x 5)/1000) x 2000] – [((23 x 5)/1000) x 1000] = 485 kWh

The existing fixture watts are determined from a fixture by fixture audit performed at the locations. The operating hours are determined from usage data observed during the audit and conversations with building personnel.

Maintenance Savings

Annual material maintenance savings can be calculated by comparing the life expectancy of both the existing and new lamps and the associated costs of replacement as well as the lamp life that is left on the existing fixtures. Taking the difference between the projected replacement costs of the new lamps and ballasts material over the course of the project versus the replacement costs of the existing lamps and ballasts materials yields an annual savings. This was done separately for each fixture in the City. The material savings is calculated using the formula below:

*Material Savings Per Year = {[H/(D/C)]*A*F} – {[H/(E/C)]*J*A} H*

Where:

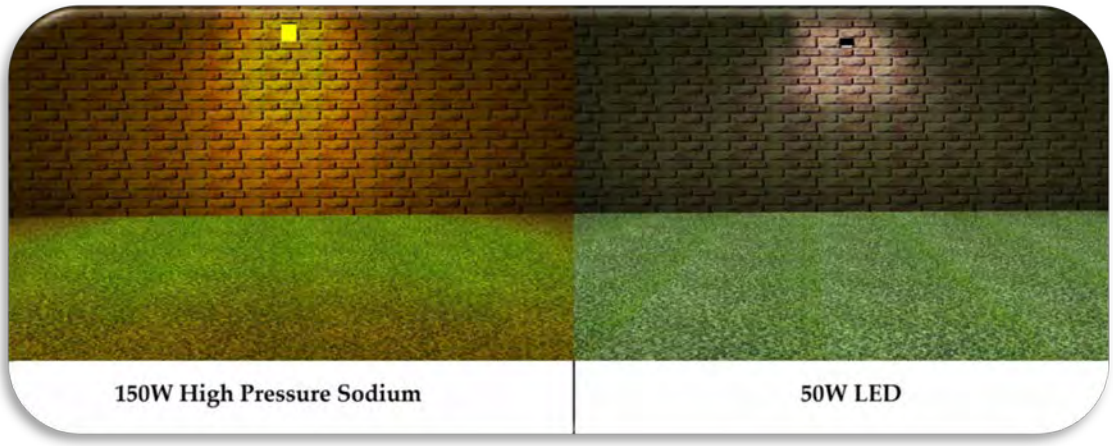
A = # of existing lamps or ballasts	*F= Labor Hours required to replace existing lamps*
B = # of new lamps or ballasts	*G = Labor Hours required to replace proposed lamps*
C = Hours lamps are used per year (hrs/year)	*H = Performance Contract Term (years)*
D = Life of existing lamps and ballasts (hrs)	*I = Cost to replace existing fixture*
E = Life of proposed lamps and ballasts (hrs)	*J = Cost to replace new fixture*

Note: Hourly Rate = $20

ECM 1.2: Exterior Lighting Savings Calculation Methodology

Description

Many existing facilities owned by the City of Punta Gorda utilize High Intensity Discharge (HID) wall pack fixtures rated between 50-175 Watts per fixture for building exteriors. ConEdison *Solutions* recommends installing retrofit kits or replacing HID lighting fixtures with LED or induction lighting. Along with significant energy savings, induction lighting lasts up to 5 times longer than HID lighting. Induction lighting also provides significantly higher color rendering which results in a more natural and uniform appearance. The difference in color rendering is illustrated in the comparison below. *Note: For a more technical explanation of the benefits of Induction and LED lighting, see ECM 1.4*



Savings Analysis

The potential savings of the proposed ECM1.2 - Exterior Lighting Improvements and Controls are illustrated in the table below:

City of Punta Gorda Facilities Lighting Improvements and Controls							
ECM 1.2	Lighting Retrofit		Occupancy Sensors	HVAC Cooling	Estmated Energy Savings*	Maintenance Savings	Total Annual Cost Savings
	kW Savings	kWh Savings	kWh Savings	kWh Savings			
Exterior Lighting Measures	8.0	35,058	0	0	$ 3,155.18	$ 536.50	$ 3,691.68
* Based on an average lighting utility rate of $0.09/kWh							

A guaranteed utility savings of 95% or $2,997.42 for Exterior lighting upgrades are used in the ECM Master Plan for payback calculations. See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values.

The Savings Calculation Methodology for ECM 1.2 is identical to those shown for Lighting and Control Savings and Maintenance Savings in ECM 1.1 on the previous pages.

ECM 1.3: Lighting Improvements at WTP and WWTP

Description

The City of Punta Gorda's Water Treatment and Waste Water Treatment Plants present a unique challenge in that each has a mixture of industrial process areas (lit using HID fixtures) and office areas (lit using fluorescent fixtures). Therefore the solution that we propose is combining the advantages mentioned previously for both technologies.

We propose the same retrofit option of the fluorescent fixtures in the WTP and WWTP offices as is proposed in ECM 1.1. Similarly, we also propose retrofitting the existing HID fixtures to induction lighting technology in the process areas in the same manner that's described in ECM 1.4.

Savings Analysis

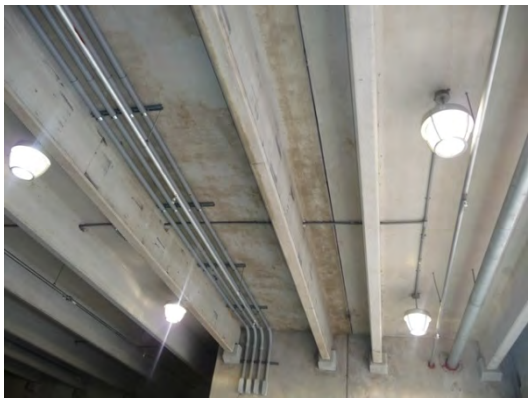
We anticipate the following annual cost savings associated with the proposed WTP and WWTP lighting retrofit:

City of Punta Gorda - Waste Water Treatment Plant and Water Treatment Plant Lighting Improvements and Controls							
ECM 1.3	Lighting Retrofit		Occupancy Sensors	HVAC Cooling	Estmated Utility Savings*	Maintenance Savings	Total Annual Cost Savings
	kW Savings	kWh Savings	kWh Savings	kWh Savings			
LED Retrofit	33.3	122,773	8,385	0	$ 11,804.22	$ 2,360.20	$ 14,164.42
* Based on an average lighting utility rate of $0.09/kWh							

A guaranteed utility savings of 95% or $11,214 for WTP & WWTP lighting upgrades is used in the ECM Master Plan for payback calculations. See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values.

The Savings Calculation Methodology for ECM 1.3 is identical to those shown for Lighting and Control Savings and Maintenance Savings in ECM 1.1 on the previous pages.

ECM 1.4: Lighting Improvements- Herald Street Parking Garage




ConEdison *Solutions* proposes to replace existing high intensity discharge fixtures at the Herald Street Garage with newer LED technology which uses approximately 50% less energy and lasts at least 5x longer.

Description

The Herald Street Parking Garage is currently illuminated using Metal Halide HID fixtures. Over time, the amount of light produced by these fixtures reduces considerably due to mechanical failure and dirt depreciation. That is why ConEdison *Solutions* recommends two options for replacing existing HID fixtures with either LED lighting that have a rated life of 75,000 hours (compared to 12,000 hours for Metal Halide). Both lighting technology provides better light quality, lower maintenance costs, and substantial energy cost savings.

Light emitted from LED sources is much clearer and offers a significantly higher level of color contrast than HID lamps. This is due to the higher scotopic/ photopic lighting ratio associated with these lighting sources. The end result is an overall brighter appearance of objects under LED lighting. Since these technologies are so new to the market, the issue facing the illuminating engineering industry is "How do we quantify this difference in quality?"

The Illuminating Engineering Society (IES) acknowledges this difference in its most recent edition released in 2011. They do not, however, provide a metric that accounts for this difference (It should be noted that the average time between IES edition releases is about 10 years). Therefore, if calculated using the exact letter of the IES recommended practices, the lighting photometrics for non-HID sources are substantially undervalued.

The Herald Street Parking Garage has 127 metal halide surface mounted fixtures located on the first three levels that burn 24/7 and 8 metal halide pole-mounted fixtures that burn approximately 12 hours per day on the roof parking deck. Our solution involves replacing these fixtures with state-of-the-art technology which meets the lighting requirements while resulting in significant energy saving and maintenance cost reduction

New Lighting Technology

LED lighting out-performs HID in terms of energy efficiency, light quality, and rated lamp life. Until recently the initial cost of LED technology made them economically unfeasible. Now that energy prices continue to rise and the public has perception of energy efficient lighting technologies, the acceptance and adaption of these technologies by the marketplace has rapidly expanded. This ever expanding market drives innovation forward and helps lower installed costs.

Both technologies provide a higher Color Rendering Index (CRI), making shapes appear clearer and providing greater overall contrast. This helps the eye distinguish objects easier under LED lighting than high pressure sodium.

As illustrated in the photographs below, LED lighting provides a superior quality of light which allows for much lower power densities when compared to traditional HID sources.

High Pressure Sodium Light Fixture

LED Light Fixture

Savings Analysis

We anticipate the following annual cost savings associated with the proposed Parking Garage Lighting Retrofit:

City of Punta Gorda - Parking Garage Lighting Retrofit				
Existing Conditions = (100W Metal Halide + 100W Quartz Running Simultaneously)				
ECM 1.4 Options	Annual Energy Cost Savings*	Maintenance Material Savings	Maintenance Labor Savings	Total Annual Cost Savings
LED Retrofit	$ 10,838.4	$ 499.80	$ 2,388.00	$ 13,726.18
* Based on an average lighting rate of $0.09/kWh				

A guaranteed utility savings of 95% or $10,296 for LED lighting upgrades are used in the ECM Master Plan for payback calculations. See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values.

The Savings Calculation Methodology for ECM 1.4 is identical to those shown for Lighting and Control Savings and Maintenance Savings in ECM 1.1 on the previous pages.

ECM 2: Street and Park Lighting Improvements

Description

For many years high pressure sodium lighting fixtures have been almost the standard in street lighting. This is because no lighting technology could provide a combination of light output, energy efficiency, and rated lamp life that could compete with high pressure sodium. Thanks to evolving lighting technology, times have changed. Light Emitting Diode (LED) lighting technology can compete both in performance and economic feasibility. Both offer superior lighting performance while also affording considerable energy savings. The following is a brief overview of the performance advantages of these technologies.

Our proposal involves helping the City of Punta Gorda update its lighting requirements to keep up with ever-evolving technology. Our proposal affords for an attractive payback period through energy savings while employing an innovative approach to roadway lighting design.

LED Lighting

Only in the last 5 years has LED become accepted and used for roadway lighting. Recently, the LED market has been able to provide a competitive efficacy at higher voltages and wattages. While LED and induction lighting offer comparable light quality, LED lighting affords a few opportunities that induction cannot match. These include more concise light distribution and color temperature adjustment.

LED light distribution is much easier to control than either induction of HPS lighting sources. This is due to the fact that each individual LED lamp can be independently aimed to provide a concise and even distribution. HPS and induction rely on antiquated reflector technology in which a great deal of light is lost in the reflection process. Also reflected lighting sources tend to produce more glare at higher installation heights, whereas only a small portion of LED lamps (the ones directly in line of site of the observer) produce noticeable glare.

The other benefit of LED lighting is that it is available at different color temperatures. LED fixtures are available with either a warm white (3000K) or cool blue (6000K) color output and everything in between. LED lighting can also be manufactured to provide an amber color output. This is unique because LED is the only “Turtle Safe” light source that can be achieved without filters that reduce efficiency.

Site-Specific Approach

ConEdison Solutions proposes an innovative approach for the City of Punta Gorda 384 decorative fixtures used to illuminate several streets, sidewalks, pedestrian walkways, etc. throughout the City. These fixtures are scattered throughout the City and require various voltages between 120V- 480V. All of these fixtures are considered to be metered and charged by Florida Power & light based on actual energy consumption on a general service (GS-1) rate schedule.

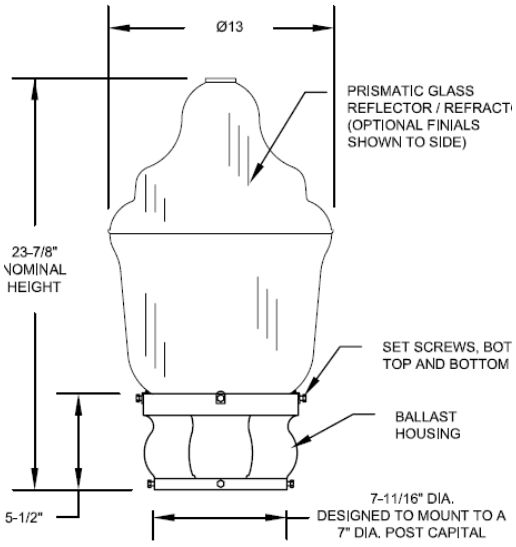


Diagram of existing Halophane Granville® Fixture

Note that all of the lighting fixtures on Department of Transportation (DOT) roadways have been omitted from this report, as present policy of DOT does not permit use of LED lighting for DOT projects. However, as certain areas in the state have been working with DOT to establish LED specifications that will meet DOT criteria, there may be future opportunity to implement LED lighting and reap energy savings sufficient to enable adequate economics for new installations, and eventually, retrofits.

LED Retrofit Option: ConEdison *Solutions* proposes to retrofit the existing high pressure sodium acorn fixtures mounted on existing poles with a new 40W LED lamp retrofit kit. Each new fixture will be independently fused as part of the installation. This retrofit will be accomplished by removing the internal components within the Halophane Granville® fixtures and replacing with the LED retrofit kit. This retrofit kit has been used in several other installations to retrofit this specific fixture.

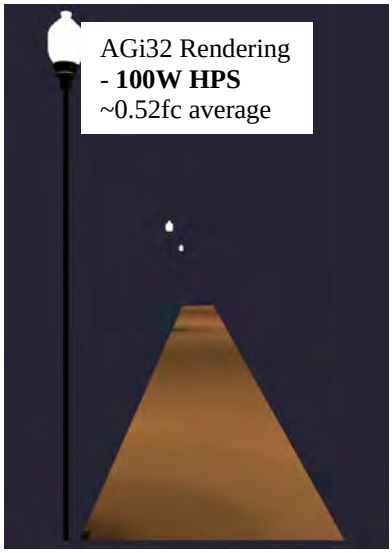
An illustration of the process is provided at the top of the next page.

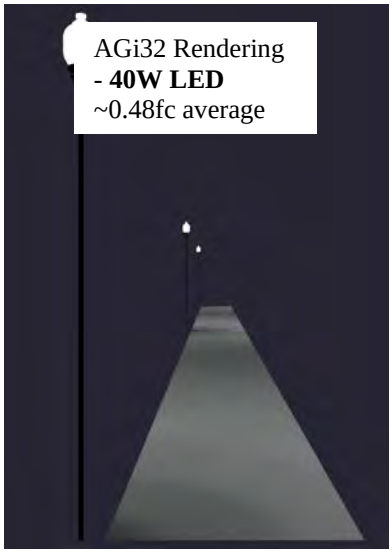
The above illustration outlines the process of disconnecting the existing acorn fixture and removing the ballast assembly. Below you can see the process of installing the LED module assembly and lamp to complete the retrofit.

Post-top (Acorn) Fixture Retrofit Performance Analysis

In an effort to gauge how the LED retrofit will perform, we conducted a site survey and measured the existing lighting levels in several areas at Laishley Park. One of the first things we observed was a lack of overall uniformity to the lighting layout. In some instances the light fixtures are spaced very far apart and sometimes they are much closer together. While it would be ideal to bring the site up to IES recommended lighting levels, the inconsistent spacing of the existing poles precludes Con Edison *Solutions* from being able to achieve this as part of our energy savings project. Therefore our design approach was to match or exceed existing lighting levels. The challenge was to identify as consistent a stretch of walkway as possible that's not being affected by light spill from other areas. For these reasons we used two stretches of walkways; one along the north side of the park near the pier and another "S" shaped section just east of the children's play area.

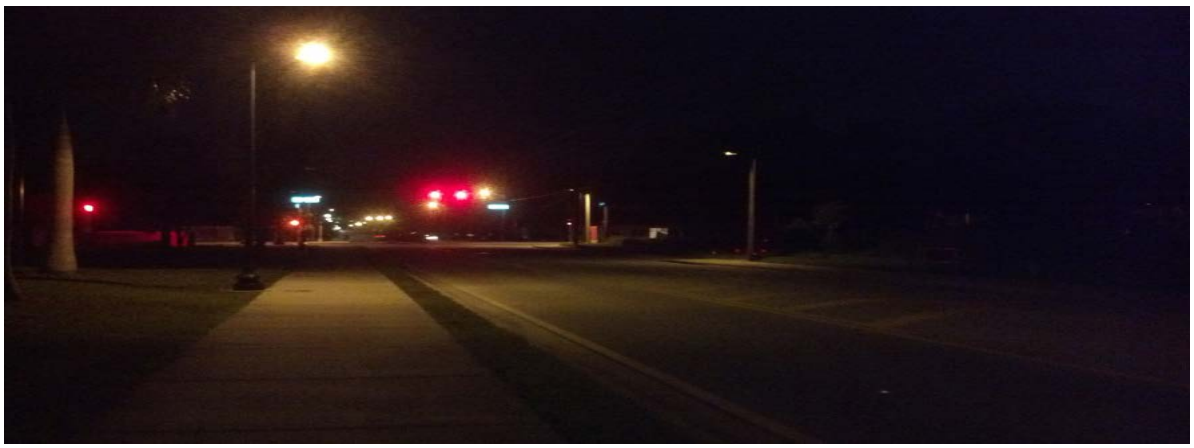
Along these stretches of sidewalk, we found that the overall illumination under the 100W HPS fixtures to be almost equivalent with an average of about 0.52fc. Photometric analysis indicates that we can affectively match this performance using an LED retrofit which we calculate will produce an average of 0.48fc along the walkways in these areas. This is possible due to the spectral enhancements associated with LED lighting as well as improved efficacy of the lamp source. The two photometric renderings in the illustrations below demonstrate this point. While the overall illumination of the two pathways appears nearly identical, the *60%* energy savings is profound. See photos on the next page.





Carmalita Ave. Belltop Retrofit

One unique retrofit opportunity exists on Carmalita Ave outside of Charlotte High School. The fixtures along this stretch of roadway are a bulky, rounded fixture that's commonly referred to as a "belltop" fixture. While aesthetically pleasing to look at during the daytime, they produce little usable light on the roadway at night. This is due in large part to the non-reflective black housing and external backlighting shields that are greatly degrading the performance of the fixture. After conducting a nighttime survey, we confirmed that the existing lighting conditions do not conform to IES recommended practices for roadway lighting. The following photograph taken at about 10:30pm shows the poor light distribution of this fixture.



Existing Conditions - Carmalita St. looking west towards Cooper St

While we cannot bring the existing system up to recommended practices within the scope of a retrofit, we can offer the City of Punta Gorda the opportunity to save energy on these fixtures by replacing the existing 250W HPS lamps with new 100W LED lamps. From a performance perspective, it will also greatly improve the overall quality of the light on Carmalita Ave by affording the spectral benefit benefits of LED over HPS lighting.

Existing Belltop Fixture -
250W HPS

Proposed Lamp Retrofit
100W LED

Replacement Fixtures

One major roadway that's being considered as part of our project is Aqui Esta Drive. This stretch of roadway is a two lane street that serves primarily residential areas and is currently lit using 400W High Pressure Sodium (HPS) fixtures mounted at 45'-0" above grade. Given the size and type of fixtures currently installed, retrofitting them does not make sense because the housing cannot facilitate new LED's and their drivers. After conducting photometric analysis on a sample portion of the roadway, we've confirmed that these fixtures can be installed while still meeting IES recommended practices for roadway lighting.

There are also a few odd fixtures that do not conform to any typical category. These include HID wallpacks, linear fluorescent fixtures, and spot lights. Given the small amount of these fixtures in our project we also propose replacing them instead of retrofitting them.

With this in mind ConEdison *Solutions* has explored an LED fixture replacement that affords superior performance while also providing improved energy efficiency.

Phillips Roadview LED
(Aqui Esta Blvd)

Stonco Wallpack LED
(Laishley Park Restrooms)

Savings Analysis

We anticipate the following annual cost savings associated with the proposed exterior Lighting Retrofit:

City of Punta Gorda - Street and Park Lighting Retrofit				
ECM 2		Annual Energy Cost Savings*	Maintenance Cost Savings	Total Annual Cost Savings
LP Gazebo Fluorescent	40 watt	$ 22.39	$ 78.80	$ 101.19
Street Acorn - Single Fixture	100 watt	$ 6,380.35	$ 570.00	$ 6,950.35
LP Acorn - Single Fixture	150 watt	$ 3,026.94	$ 147.50	$ 3,174.44
Street Acorn - Double Fixture	100 watt	$ 83.95	$ 7.50	$ 91.45
Street Pendant	150 watt	$ 1,590.42	$ 85.00	$ 1,675.42
Street Pendant	250 watt	$ 293.83	$ 7.50	$ 301.33
LP Wall Pack	100 watt	$ 139.92	$ 12.50	$ 152.42
LP - Restroom Wall Pack	175 watt	$ 503.71	$ 20.00	$ 523.71
LPG Spotlight	1000 watt	$ 279.84	$ 2.50	$ 282.34
Street Cobrahead	400 watt	$ 3,565.16	$ 105.00	$ 3,670.16
	Total (814)	**$ 15,886.52**	**$ 1,036.30**	**$ 16,922.82**
* Based on an average streetlighting rate of $0.11/kWh				

A guaranteed utility savings of 95% or ***$15,092.19*** for Street and Park Lighting upgrades are used in the ECM Master Plan for payback calculations. See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values.

Additional savings calculation methods for ECM 2 are provided on the following page

Area Considered But Not Recommended

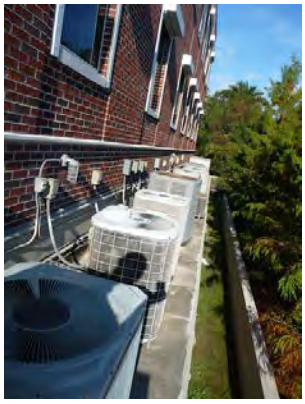
One other area that we looked at was the tennis court at Gilchrist Park. It's currently lit using (8) 1000W metal halide fixtures. We researched possible retrofit options but were unable at this time to identify an LED fixture that provides comparable performance characteristics. Therefore the Gilchrist Park Tennis Court has been left out of our final report.

ECM 3: Mechanical Upgrades

Description

Direct Expansion Equipment Replacement

Facilities in scope: City Hall, City Hall Annex, Fire Station #3 and Public Safety



The pictures above shows mechanical equipment at the City of Punta Gorda Facilities that will be replaced as a part of this scope of work.

ConEdison *Solutions* surveyed all HVAC equipment and systems throughout City of Punta Gorda facilities as part of this investment grade audit. Information such as manufacturer, age, current condition, energy performance and useful life remaining were tabulated. ConEdison *Solutions* also conducted interviews with City staff to better identify and understand any issues with the current HVAC systems.

Small tonnage direct expansion (DX) systems do not offer favorable economics for replacement under an energy savings projects on their own. However bundling these items with other cost effective energy conservations measures allows us to include a number of these much needed replacements in a performance contract. A number of the DX systems surveyed are past their expected useful life and are in need of replacement. The coastal environment in Punta Gorda means a high level of salt in the air that leads to accelerated coil degradation on all condensing units. According to ASHRAE, the anticipated useful life of DX equipment is 15 years. The environment can degrade the equipment more quickly depending on durability of the materials used to construct the equipment

All HVAC systems were surveyed and the equipment identified for replacement has been selected based on age, existing conditions and current performance. Only equipment over 10 years old or equipment which showed significant coil degradation was considered for replacement. The list of DX equipment in scope for replacement is shown by building below:

Fire Station # 3

Location	Equipment Description	Size	Scope of Work
Fire Station # 3	Trane DX Split System	1.5 ton	Like-in-kind Replacement
Fire Station # 3	Trane DX Split System	3.5 ton	Like-in-kind Replacement

Public Safety

Location	Equipment Description	Size	Scope of Work
Public Safety	Carrier Split System	3.5 ton	Like-in-kind Replacement
Public Safety	Ductless Window AC Unit	12000 Btu	Replace w/ ductless mini-split DX system
Public Safety	Carrier Air Cooled DX Condenser	12.5 ton	Like-in-kind Replacement
Public Safety	Carrier Air Cooled DX Condenser	15 ton	Like-in-kind Replacement
Public Safety	Carrier Air Cooled DX Condenser	10 ton	Like-in-kind Replacement
Public Safety	Goodman Air Cooled DX Condenser	5 ton	Like-in-kind Replacement

City Hall

Location	Equipment Description	Size	Scope of Work
City Hall	Tempstar DX Split System	3.5 ton	Like-in-kind Replacement
City Hall	Tempstar DX Split System	2.5 ton	Like-in-kind Replacement
City Hall	Tempstar DX Split System	2.5 ton	Like-in-kind Replacement
City Hall	Ruud DX Split System	2.5 ton	Like-in-kind Replacement
City Hall	Payne DX Split System	2.5 ton	Like-in-kind Replacement
City Hall	Tempstar DX Split System	2 ton	Like-in-kind Replacement
City Hall	Tempstar DX Split System	2 ton	Like-in-kind Replacement

City Hall Annex

Location	Equipment Description	Size	Scope of Work
City Hall Annex	Trane DX Split System	3.5 ton	Like-in-kind Replacement
City Hall Annex	Tempstar DX Split System	3 ton	Like-in-kind Replacement

Location	Equipment Description	Size	Scope of Work
City Hall Annex	Feeders DX Split System	2.5 ton	Like-in-kind Replacement
City Hall Annex	Amer.Stand. DX Split System	5 ton	Like-in-kind Replacement
City Hall Annex	Trane DX Split System	4 ton	Like-in-kind Replacement
City Hall Annex	Trane DX Split System	5 ton	Like-in-kind Replacement
City Hall Annex	Trane DX Split System	5 ton	Like-in-kind Replacement
City Hall Annex	Trane DX Split System	7.5 ton	Like-in-kind Replacement

ConEdison *Solutions* will replace all the DX equipment above with premium efficiency equipment having a SEER/EER rating above minimum Energy Star and ASHRAE guidelines. All new units will utilize environmentally friendly R-410 refrigerant. New equipment will be installed in current location of existing equipment. New wind load tie downs and electrical disconnects will be included where necessary. Existing equipment will be safely removed and disposed including refrigerant recovery in accordance with EPA Regulations. Existing refrigerant lines where size is compatible with the new units will be reused by flushing and pressure testing prior to charging with R-410 refrigerant. All exposed suction lines will be reinsulated with new closed cell foam insulation.

Direct Expansion Coil Replacement

Facilities in scope: Public Safety

The two Existing custom-built air-handling units at the public safety building will be retrofit with new Temtrol DX cooling coils as part of this scope.

The existing air-handling units at the Public Safety building are custom-built units, which were installed during building construction in a mechanical mezzanine above the occupied space. A large louvered window that brings in outside air to the units was used to seal the exterior penetration to this mezzanine level. Access to these units is gained via a ladder within an interior storage room. This setup makes replacement of these AHUs cost prohibitive. Instead, ConEdison *Solutions* proposes to replace the existing DX coils within each unit with new coils manufactured by Temtrol. These new coils will also utilize R-410 refrigerant to match with the new condensing units previously discussed.

Test & Balance Services

Facilities in scope: Public Safety

During the site audit, ConEdison *Solutions* interviewed several building occupants to identify known issues with the HVAC system at the Public Safety Building. Based on our documented notes and subsequent discussion with Public Works staff, we propose to perform a full HVAC system test and balance in order to determine that the HVAC system is delivering the correct air quantities at the required conditions to each air outlet and that the system is operating in accordance with design specifications. Occasionally, a system cannot be balanced or made to perform in accordance with the design specifications regardless of the number of balancing dampers or valves that can be installed due to design issues or changes in the space configuration. ConEdison *Solutions* will formulate recommendations and implement cost-effective retro-commissioning strategy. This scope in conjunction with the new energy management control system installation will improve the indoor air quality, and overall occupant comfort within this facility.

Add a Mini-Split to the Second Floor Southwest Corner Office

Facilities in scope: City Hall

ConEdison *Solutions* has been informed that the office of City Financial Officer, Dave Drury, in the Southwest corner of the second floor of the original City Hall building is much warmer than the rest of the spaces served by the main Air Handling Unit. We were asked to investigate a solution, including possibly using window tinting to reduce the load. See "*ECMs Considered But Not Included*" for a description of the window tinting solution.

Adding a dedicated cooling only, one ton, direct expansion (DX), mini-split system does not offer any measurable energy savings, and thus has no positive economic impact on the overall project. In fact, it will negatively affect the overall payback analysis. It will however offer a comfort solution to the occupant(s) of that corner office, and will marginally unload the main Air Handling Unit.

ConEdison *Solutions* will provide a new DX mini-split with a minimum efficiency of 13 SEER and utilize environmentally friendly R-410 refrigerant. This equipment has two major components, the evaporator and condenser units. The evaporator will be installed in the office space, and controlled by a wireless remote control. The condensing unit will be installed at ground level outside the building and behind existing shrubbery. An acceptable and aesthetically pleasing method of routing the refrigerant line set either on the exterior or interior of the building will have to be devised. A dedicated 115V, 20 amp electrical circuit must be provided. All exposed suction lines will be reinsulated with closed cell foam insulation.

Savings Calculations Methodology

For these smaller applications, a custom spreadsheet was used to calculate annual energy use to determine the savings potential based on the equipment efficiency ratings and cooling degree days for Punta Gorda, Florida. The calculations are provided in the Appendix and a summary is provided below.

Mechanical Savings

Facility	Total kWh	kWh Saved	$$$ Saved
City Hall	91948	20,260	$ 2,289.36
City Hall Annex	306540	51,757	$ 4,502.89
Fire Station 3	79651	6,764	$ 696.72
Public Safety	619920	22,301	$ 1,717.15

A guaranteed utility savings of 90% or $2,060 for City Hall, $4,053 for City Hall Annex, $627 for Fire Station 3 and $1,545 for Public Safety HVAC upgrades are used in the ECM Master Plan for payback calculations. See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values.

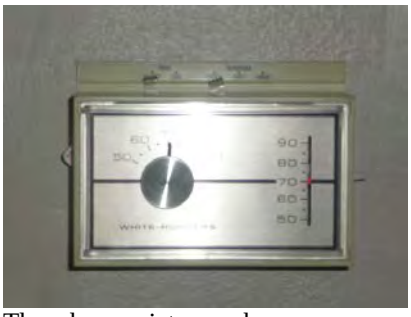
Due to the nature of this ECM and its dependency on weather conditions and other dynamic factors, there is no means by which to M&V the savings. The savings presented here are stipulated based on ASHRAE methodology.

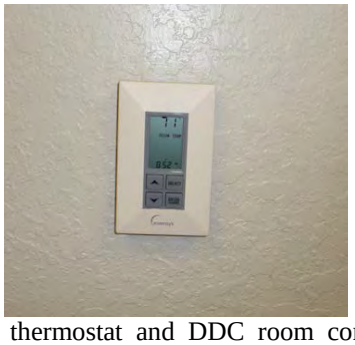
ECM 4: Energy Management Control System Upgrades

Description

Energy Management Control System Installation

Facilities in scope: City Hall, City Hall Annex, Public Safety, Bayfront Center, Laishley Park Marina Building, Cooper Street Recreation Center, Public Works/ Utilities Compound





The above pictures show a non-programmable thermostat, programmable thermostat and DDC room controller, depicting a variety of temperature controls devices which currently exist in the City of Punta Gorda facilities. This scope of work will replace, reconfigure or modify the existing HVAC controls to improve comfort and energy efficiently.

ConEdison *Solutions* surveyed all HVAC controls within each facility as part of this investment grade audit. A variety of different non-programmable thermostats, programmable thermostat and building automation system (Invensys System located at Public Safety Building only) were identified.

Non-Programmable Thermostat (picture - far left): Non-programmable thermostats were found in several locations throughout the City of Punta Gorda facilities. These devices are manually controlled on and off and offer only two distinct temperature settings (hotter/ colder). They rely on County Staff to turn them off at the end of the day and often times they end up running 24 hours per day and on weekends. These devices offer no energy savings features and will be replaced with a commercial programmable thermostat under this scope of work.

Digital Programmable Thermostat (picture - at center): Digital programmable thermostats were found in several locations throughout the City of Punta Gorda facilities. Some of these thermostats had a lock-feature and only some were utilized. We recommend that these thermostats be programmed and locked with the occupancy override feature enabled where available. We recommend replacing some of these thermostats in larger buildings that can benefit from having a web-based energy management control system under this scope of work.

Invensys Building Automation System:

The Public Safety Building has a Microsoft DOS based Invensys DDC Control System that is original to the building. This system currently controls two (2) dual path air handling units, fourteen (14) VAV boxes with electric reheat, one (1) energy recovery ventilator and back-up fan coil ventilator which serves the 911 Dispatch Area. The system software is obsolete, components have failed over the years and it offers limited functionality compared to today's energy management control systems. Due to its age and limited energy management control features the cost, which would be incurred to upgrade the existing system, is better spent installing a new control system.

Energy Management Control System

ConEdison *Solutions* proposes to replace the existing control systems and thermostats at City of Punta Gorda Public Safety facility with a graphically driven web-based energy management control system. ConEdison *Solutions* does not recommend any particular brand or vendor for controls. We will, however, specify a system that is open and non-proprietary on multiple levels. These are:

- Customer has the ability to procure *service* from multiple vendors
- Customer has the ability to procure *parts* from multiple vendors
- Customer owns the database generation *tools* so that they can edit and modify the system without having to call upon an "factory authorized" vendor
- Customer retains the *credentials* for administrative level login to add to and modify the system at future dates
- The system utilizes an *open protocol*, preferably BACnet MS/TP at the controller level
- The system is *web accessible* using only a common web browser. Not a licensed proprietary software
- The system software and hardware must remain *licensed indefinitely* without special and costly updates and maintenance
- The system must be *scalable and expandable* to fit different size facilities, up to and including a multi-facility municipality

Any selected Energy Management System shall include the following features at a minimum:

- Multiple levels of user access through user defined logins and passwords
- Graphically driven user interface including a home page, floor plans, system summaries, and equipment & system specific graphical representations
- Ability to create and modify schedules for start/stop, modes and set points
- Ability to define holidays and special events that will override the base schedules
- Ability to manually command, adjust or override set points and other control parameters
- Ability to create, modify and view historical values of critical system points and parameters
- Ability to define, view and acknowledge specific alarms for critical points and parameters
- Ability to create & view standard and custom reports and summaries like: user activity, active overrides, active alarms, all points, and points of a specific or partial name.
- Ability to create, view and modify custom control logic and interlocks

All HVAC systems were surveyed as part of this investment grade audit. Facilities in scope were selected based on condition of the existing HVAC controls, size of facility and complexity of the HVAC equipment being controlled.

Location	Equipment to be controlled
Public Safety	2 Dual Path AHUs 1 Energy Recovery Ventilator 1 Fan Coil Unit 14 VAV boxes w/ electric reheat

ConEdison *Solutions* will provide and install all equipment necessary to provide a fully functioning web-based energy management control system. The new systems will provide equipment scheduling and temperature control plus provide proof of status and fan discharge temperature on a dynamic graphical display for each piece of equipment on the system.

Variable Frequency Drives

Facilities in scope: Public Safety

The existing variable frequency drive installed on AHU-1 at the Public Safety Building is original to the installation but operational. This VFD unit appears operate correctly and control the supply fan speed based on duct static pressure sensor, however, the LCD display screen has failed. ConEdison *Solutions* will provide and install a new VFD display on this unit's VFD and verify operation as part of the controls project.

Variable Air Volume Box Reprogramming

Facilities in scope: Public Safety

ConEdison *Solutions* proposes to reprogram the minimum set-points of the fourteen (14) VAV boxes throughout the Public Safety building to a point such that the minimum rates as per ASHRAE 62 are achieved. The VAV boxes provide a minimum amount of air to the spaces even when the spaces are unoccupied. The design delivered air to each space is based on full occupancy; some areas such as the police training room and fire station break room have significant periods of the day when occupancy is low. This ECM will enable the City to see energy savings resulting from these periods of low occupancy. This will prevent overcooling and ensure that the electric reheat is not activated when not needed.

Outside Air Ventilation Control

Facilities in scope: Public Safety and Cooper Street Recreation Center

ASHRAE 62 requires that a minimum amount of fresh air be delivered to conditioned spaces based on occupancy. The majority of air handling units within the City of Punta Gorda facilities are providing minimum fresh air. However the air handling units that serve the Public Safety building HVAC system, and the 100% outside air unit at Cooper Street Recreation Center provide a significant amount of fresh air to these spaces due to the high maximum occupancy of these areas. For extended periods of time when these areas are unoccupied as well as nights in setback mode, the outside air duct can be modulated to meet current fresh air demand and closed at nights/weekend to conserve energy.

ConEdison *Solutions* proposes to implement this energy saving strategy within these facilities as part of the control system upgrade. At the Cooper Street Recreation Center CO2 sensors will be used to energize the 100% outside air unit & general exhaust fan(s). At the Public Works Building fresh air will be modulated through a series of CO2 sensors tied into the new energy management control system.

Programmable Thermostats

Many of the DX Split and Packaged RTU systems already have a modern, commercially applicable, programmable thermostat. These thermostats should be verified for proper configuration and locked out except for local temporary set point adjustment and temporary occupancy override. Any non-programmable digital or mechanical (bi-metallic, mercury bulb) thermostats will be replaced with a new programmable thermostat and configured as required. Where thermostats serve multiple spaces as isolated by vertical partitions and walls, remote averaging sensors will be added to improve comfort as a whole. Floor plans showing the proposed sensor locations are in the Appendix.

Location	Equipment to be controlled
City Hall	1 Packaged AHUs 7 Split AHUs 2 Multi-stage AHUs
City Hall Annex	10 Split AHUs
Bayfront Center	4 Packaged AHUs 3 Split AHUs
Laishley Park	5 Split AHUs
Cooper St. Recreation Center	8 Split AHU 1 100% Outside AHU
Public Works/Utilities	20 DX Split System AHUs

Savings Calculations Methodology

The systems considered for Energy Management Control System Upgrades were modeled using the Carrier HAP program. Where comprehensive as-built drawings are not available for the facilities with proposed control upgrades, the model was built using the best data available from field visits. There is no guarantee that schedules will be maintained by users. Due to the state of the existing Public Safety control system, VAV set points cannot be verified without testing and balancing the AHU systems and all the associated boxes, which is outside the scope of the IGA contract. The output of the models is located in the Appendix. Savings have not been claimed for the averaging temperature sensor proposed at City Hall Annex. The purpose of these devices is for comfort rather than energy savings.

The following utility savings are guaranteed 100% of the calculated values as used in the ECM Master Plan for payback calculations:

City Hall $1,084
City Hall Annex ..... $ N/A
Public Safety $2,401
Bayfront Center ..... $ 866
Laishley Park Marina ..... $ 130
Cooper Street Recreation Center ..... $ 378
Public Works/Utilities ..... $ 998

See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values.

Due to the nature of this ECM and its dependency on weather conditions and other dynamic factors, there is no accurate means by which to M&V the savings. The savings presented here are stipulated based on ASHRAE methodology. The calculations were performed with computer modeling utilizing Carrier HAP, and the outputs are presented in Appendix D.

ECM 5: Ice Machine Heat Exchangers

Description

This ECM focuses on installation of a pre-cooler heat exchanger on the inlet side of the water make up for the ice machine. The unit reduces the temperature of the water that enters the ice machine by passing the ice that has condensed through the heat exchanger prior to disposing of it. This allows the ice machine to convert water to ice with less electrical energy. Ice making cycle times are shorter which produces more ice. Ice availability in the bin is optimized which potentially eliminates the need to buy additional bags of ice. The life of the ice machine can be extended by lowering compressor head pressure. For air-cooled ice machines the air conditioning costs are also reduced. The heat exchanger is low maintenance utilizing patented anti-mineralization technology.

Maximicer Installed on Ice Machine

Savings Calculation Methodology

CES inventoried the ice machines in the surveyed facilities and reviewed the City's Ice Machine Maintenance Agreement for comparison. Machines with a capacity of less than 400 lbs ice per 24 hour period cannot be retrofit with this technology. Therefore, the 300 lb/24 hr unit at the Water Treatment Plant, the 250 lb/24 hr unit at Canal Maintenance and the 320 lb/hr unit at Fire Station #3 have not been included in the calculations. The savings calculations for the six units that are sized at or above 400 lb/24 hr are shown below. The stipulated ice machine operation time at each facility is assumed to be 80% daily or 19.2 hours.

•• ICE MACHINE SAVINGS CALCULATIONS

City of Punta Gorda — Bldg	Recreation Center	Public Works Wastewater Collection	Public Works Parks	Public Works Sanitation	Fire Station 1	Fire Station 2	Totals
Model:	Ice-500ZFAC	Hoshizaki KM901MAH	ICE-O-MATIC ICE0400FA2	Hoshizaki KML451MAH	ICE-O-MATIC ICE0500FA2	Manitowac B570-1506	
Site Specific							
Blended KWH rate for location	$ 0.104	$ 0.095	$ 0.095	$ 0.095	$ 0.103	$ 0.103	
Ice Machine Run Time (% per day)	80%	80%	80%	80%	80%	80%	
Ice Machine(s)							
Ice Machine Count	1	1	1	1	1	1	6
ARI* rated ice production (lbs. / 24 hrs)	500	901	400	451	500	570	3322
ARI* rated KWH usage (KWH / 100 lbs.)	5	5	5	5	5	5	
Maximicer Info							
Observed energy savings studies							
Manitowoc, Hoshizaki 15 to 20%							
All others 25 to 30%							
Selected Savings rate:	25%	20%	25%	20%	25%	20%	
Per Unit Energy Usage (daily)							
Current Kw/h	20	36.04	16	18.04	20	22.8	132.88
With Maximicer	15	28.832	12	14.432	15	18.24	103.50
Per Unit Pre Energy Cost							
Yearly	$ 759.20	$ 1,249.69	$ 554.80	$ 625.54	$ 751.90	$ 857.17	$ 4,798.29
Per Unit Post Energy Cost (w/maximicer)							
Yearly	$ 569.40	$ 999.75	$ 416.10	$ 500.43	$ 563.93	$ 685.73	$ 3,735.34
Summary							
SAVINGS:	$ 189.80	$ 249.94	$ 138.70	$ 125.11	$ 187.98	$ 171.43	$ 1,062.95

* Ice Machine manufacturers certify ice production performance numbers at 90°F ambient air and 70°F water temperatures (ARI Standard 810 ratings).

A guaranteed utility savings of 95% or $1,010 for Ice Machine Heat Exchangers is used in the ECM Master Plan for payback calculations. See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values.

Due to the nature of this ECM and its dependency on dynamic ice usage factors, there is no means by which to M&V the savings. The savings presented here are stipulated.

ECM 6: Vending Machine Controls

Description

ConEdison *Solutions* proposes to install occupancy sensing and plug load controllers to reduce unnecessary operation of vending machines during unoccupied periods at City Hall and Laishley Park Marina. Vending machine controllers save energy used by the vending machines during periods of unoccupied hours while maintaining product quality. The controllers use dual sensor technology, as applicable, to detect space temperature and space occupancy to determine when to the turn the machine off and on.

Beverage vending machines operate continuously regardless of the presence of potential consumers. The existing soda machine's lighting operates continuously and the compressor cycles continuously. A standard vending machine with lamps draws on average 400 Watts. The snack machine does not have a compressor, but with the lamps, it draws on average 85 Watts.

ConEdison *Solutions* proposes to install a Vending Miser which consists of a Passive Infrared Sensor (PIR) and a microcontroller. The Vending Miser is an occupancy-based energy controller which will power down the machine during unoccupied hours at night and over the weekend. It then monitors the room's temperature, as applicable, and automatically re-powers the cooling system at one to three hour intervals to ensure the product stays cold. The controller is designed so that it will not de-energize the vending machine during a cooling compressor cycle. It saves money by turning off lighting and managing compressor cooling cycles, as applicable when they are not needed.

For this ECM, CES proposes the following:

- Installation of Vending Miser on one (1) cold drink vending machine at City Hall.
- Installation of Vending Misers on two (2) cold drink vending machines and a Snack Miser on one (1) snack machine at Laishley Park Marina.

Savings Calculation Methodology

CES inventoried the cold drink vending machines in the surveyed facilities. Counts and savings calculations are shown below. The stipulated City Hall and Laishley Park Marina annual occupied hours are assumed at ninety (90) hours per week which should cover normal building activities. The following calculation determines the electrics savings.

Qty	Building	Qty Drink Vending Machines	Qty Snack Vending Machines	Qty Coolers	Total Connected Demand (kW)	Existing Annual Hours of Operation	Existing Electric Consumption (kWh)	Annual Occupied Hours	Proposed Annual Hours of Operation	Proposed Electric Consumption	Operating Months per Year	Annual Electric Savings
[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]	[M]
1	City Hall	1	0	0	0.40	8,760	3,504	4,680	5,360	2,144	12	1,360
3	Laishley Park Marina	2	1	0	0.89	8,760	7,753	4,680	5,360	4,744	12	3,009
4					**1.29**		**11257**			**6888**		**4369**

Item	Value	Units	cell ref	Remarks
Existing Annual Hours of Operation per Machine	8,760	Hrs	[D14]	Vending Machines are constantly plugged in
Time Between Auto Repower	2	Hrs	[D15]	based on independent testing data
Duration of Auto Repower	0.4	Hrs	[D16]	based on independent testing data
Watts used for Drink Vending Machine	400	W	[D17]	industry average
Watts used for Snack Vending Machine	85	W	[D18]	industry average
Watts used for Coolers	233	W	[D19]	industry average

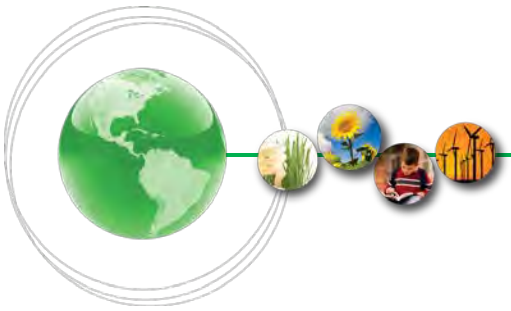
Cell Ref.	Comment
A	Estimated quantity of machines appropriate for retrofit, per site audit
B	Facility analyzed
C	Quantity of vending machines appropriate for retrofit
D	Quantity of snack machines appropriate for retrofit
E	Quantity of coolers appropriate for retrofit
F	Total connected electric demand per building = [colC] x [F17] / 1,000 + [colD] x [F18] /1,000 + [colE] x [F19] /1,000
G	[F14]
H	[colF] x [colG]
I	Annual Hours the building is occupied
J	[colI] + ([D14] ÷ 52 - [colI] ÷ 52) ÷ ([D15] + [D16]) x [D16] x 52 weeks
K	[colF] x [colJ]
L	Months per year the machine is powered on
M	[colH] - [colK]

The table below indicates the savings calculated from this ECM:

Location	Annual Savings	Units
City Hall	1,360	kWh
Laishley Park Marina	3,009	kWh
	$470	Utility Cost Savings

A guaranteed utility savings of 95% or $447 for Vending Machine Controls is used in the ECM Master Plan for payback calculations. See the M&V section of this report for more information about guaranteed savings, including measured and stipulated values.

Due to the nature of this ECM and its dependency on dynamic occupancy factors, there is no means by which to M&V the savings. The savings presented here are stipulated.

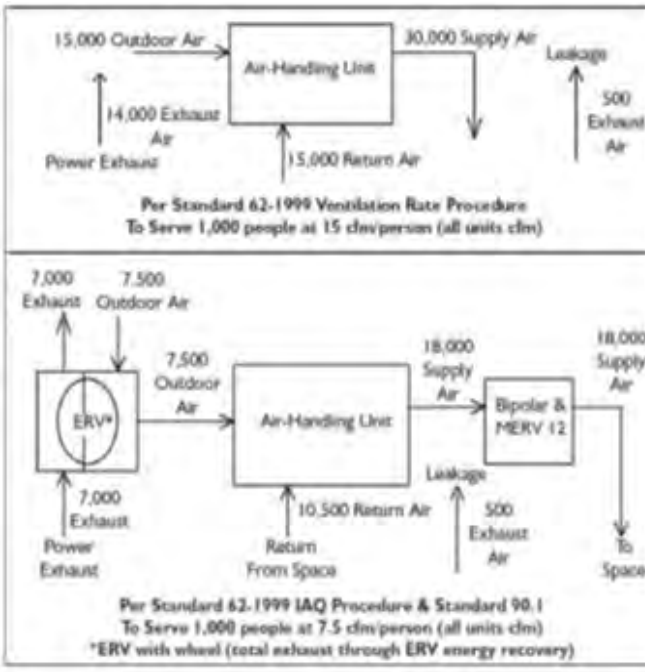


ECMs Investigated But Not Included

Outdoor Air Ionization

ConEdison *Solutions* investigated the ASHRAE 62.1 Indoor Air Quality procedure to reduce the outdoor air required for the conditioned spaces. The more commonly used ASHRAE Ventilation Rate procedure is a prescriptive method in which a specified amount of fresh outside air (15 cfm per person) is introduced into the space which allows the contaminants in the space to be diluted. The Indoor Air Quality procedure allows for design professionals to use an engineered ventilation system design that will prevent the maximum concentration of contaminants from exceeding that obtainable by the ASHRAE Ventilation Rate procedure while possibly introducing less outside, unconditioned air to the space. Thus, by using the Indoor Air Quality procedure outdoor air quantity, the cost associated with cooling, dehumidifying and heating the outdoor air can be reduced significantly.

This system was considered for inclusion at the City Hall (Council Chamber AHU and Main Unit AHU) and at the Public Safety Building (AHU-1 & AHU-2). However, it is not being recommended at this time. At City Hall, the Council Chamber AHU and the Main Unit AHU, it was identified that the outside air damper supply cfm is already below the design values. Instead, we have included adding a modulating damper with a direct digital control actuator integrated onto the new EMCS proposed for this building. The control system will close the outside air damper when the unit goes into unoccupied mode during nights and weekends and when the Council Chamber is not being used. This measure was also considered at the Public Safety Building. However, the ERV currently installed already reduces the fresh air requirement to the space. Despite the additional potential to reduce fresh air with the installation of this ionizing device, the reduced savings and Indoor Air Quality concerns by further reducing the fresh air into the building meant we did not recommend this ECM.



The diagram above illustrates the proposed configuration for the Public Safety Building versus a standard set up. Due to the fact that the building already has ERV, the outside air is already reduced.

Domestic Water Conservation

ConEdison *Solutions* audited the domestic plumbing system throughout the City of Punta Gorda facilities. Replacing high water-consuming bathroom fixtures with lower water-consuming fixtures improves water efficiency. Before 1993, toilets and urinals were typically designed to flush a minimum of 3.5 gallons of water per flush. Improvements in technology and more stringent building standards have developed toilets and urinals that are designed to flush a significantly smaller quantity of water. Additionally, older flush valve fixtures can stick open or leak producing extra water consumption. In some cases, the internal parts such as the diaphragms can deteriorate causing leaks that are often undiscovered. It was observed during our water audit that some diaphragm valves on low consumption water closets and urinals have been replaced with improperly sized replacement valves causing the fixture to consume more water than was originally than it was originally designed to consume.

Water Savings Per Toilet			
ECM: PLUMBING FIXTURE RENOVATION			
Existing GPF	**Proposed GPF**	**GPF Saved**	**Percent Reduction**
3.5	1.28	2.22	63%
1.6	1.28	0.32	20%

Water Savings Per Urinal			
ECM: PLUMBING FIXTURE RENOVATION			
Existing GPF	**Proposed GPF**	**GPF Saved**	**Percent Reduction**
3.5	0.125	3.375	96%
1.5	0.125	1.375	92%
1	0.125	0.875	88%
0.5	0.125	0.375	75%

Water Savings Per Fixture			
ECM: SHOWERHEAD FIXTURE RENOVATION			
Existing GPM	**Proposed GPM**	**GPM Saved**	**Percent Reduction**
2.5	1.5	1.0	40%

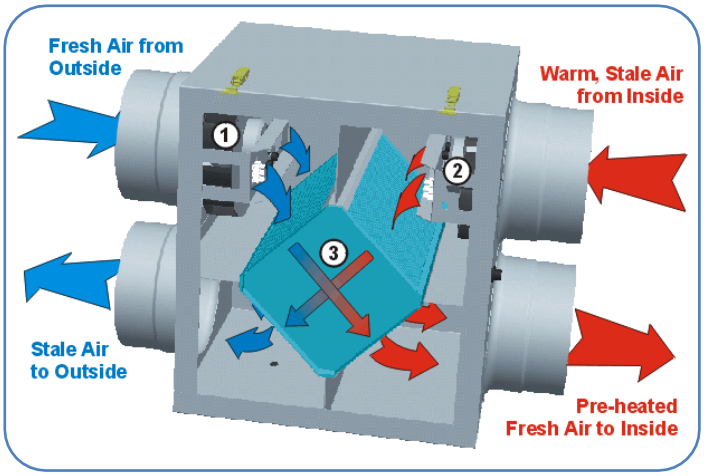
Water Savings Per Fixture			
ECM: SINK FAUCET FIXTURE RENOVATION			
Existing GPM	**Proposed GPM**	**GPM Saved**	**Percent Reduction**
2.2	0.5	1.7	77.3%
2.2	1.0	1.2	54.5%
2.2	1.5	0.7	31.8%

ConEdison *Solutions* evaluated the option of including a water conservation project in scope. Due to the relatively inexpensive cost of water, the relatively high base and refuse charges and the minimal consumption shown on these bills, it was determined that the water conservation project not be included due to its high payback. The cost to replace these plumbing fixtures could be better spent on other infrastructure improvement projects.

Energy Recovery Heat Exchangers

ConEdison *Solutions* evaluated the option of installing an energy recovery ventilator, similar to the one currently installed at the Public Safety Building, at the Bayfront Center and at the Cooper City Recreation Center. These units were evaluated to be installed on the roof of each building and interconnected with the rooftop DX packaged units at each building respectively.

An energy recovery ventilation (ERV) unit is an electronically controlled ventilation air pre-conditioner utilizing an energy recovery cassette to reduce the cooling and heating loads placed on the primary HVAC unit by untreated outdoor air. The building's exhaust air is introduced to the ERV unit through ductwork or by a specially designed transition connected to a rooftop unit. An ERV was considered for the Bayfront Center and the Copper City Recreation Center which would pre-cool the outside air before it reaches the packaged unit. While this system would result in energy savings, it is not recommended at this time, in order to facilitate the inclusion of other mechanical improvement projects which are more critical at this time such as the Public Safety Building mechanical upgrade project.



Natural Gas Vehicles

The City of Punta Gorda has a large fleet of gasoline and diesel powered vehicles. Fleet vehicles can be converted to natural gas power with EPA conversion kits to take advantage of the lower cost of natural gas versus gasoline. New vehicles can be also ordered from the manufacturer with the conversion already done. Since it is not imported from overseas, natural gas is expected to have much better long term price stability than other motor fuels. Natural gas is cleaner-burning and reduces vehicle maintenance costs and has been shown to extend engine life (in some cases doubling engine life).

Unfortunately, the availability of EPA approved natural gas conversion kits for older vehicles is severely limited. Also, with older vehicles, the time to recover the conversion cost often exceeds the useful life remaining in the vehicle. In addition, even many newer vehicles cannot be converted because not all engines produced by manufacturers are approved for conversion. All of this means that only a small fraction of the Punta Gorda vehicle fleet would be eligible for conversion to natural gas. The limited savings that would be available from the small number of vehicles converted would result in an unacceptably long payback period.

	Gasoline Vehicles	Diesel Vehicles	Gasoline Vehicle Miles	Diesel Vehicle Miles	Gallons Gasoline	Gallons Diesel	Gasoline Cost	Diesel Cost
Police Department	40	0	364,425	0	33,637.8	0	$ 123,776.28	0
Fire Department	6	5	NA	NA	2,554.3	3,574.8	$ 8,628.14	$ 13,177.95
Public Works	4	2	21,507	6,772	2,823.2	814.5	$ 9,957.77	$ 3,198.71
Utilities	25	15	121,933	85,104	13,202.6	10,823.8	$ 46,977.66	$ 43,256.65
Building Growth Management	3	0	29,500	0	1,475.0	0	$ 5,150.00	0
Totals	**78**	**22**	**537,365**	**91,876**	**53,692.9**	**15,213.1**	**$ 194,489.85**	**$ 59,633.31**

Notes:
1. Of the 40 vehicles for the Police Department, 8 are scheduled to be retired in 2013 and 2 new vehicles are scheduled to be added.

Based on the total fuel expenditure of $254,123 and the fact that a significant portion of the vehicles are not considered good candidates for retrofit, this ECM is not recommended at this time. There has been preliminary discussion by the School Board and County to construct a natural gas fueling infrastructure project. We recommend that the City partake in this joint venture, rather than going down an independent path. Once the infrastructure is in place, natural gas vehicles may be purchased by the City to replace aging fleet to reduce dependence on more costly foreign oil.

Wastewater Treatment Plant Process: CleanB-AC™

ConEdison *Solutions* often considers utilization of biosolid technology at their client's waste water treatment plants. Successful projects have been demonstrated in Florida by BCR Environmental, and it is a good technology candidate for incorporation into an Energy Savings Performance Contract using their CleanB-AC™ system.

The CleanB-AC™ system is a simple low odor accelerated composting system that may be implemented onsite or offsite to the wastewater treatment plant. The CleanB-AC™ system is BCR's patented and proven Class

AA/EQ residuals treatment system. This process is proven and is fully accepted by the United States Environmental Protection Agency and the Florida Department of Environmental Protection (FDEP) to meet all the requirements of Chapter 62-640 of the Florida Administrative Code (F.A.C.) including Class AA biosolids product. Utilizing the CleanB-AC™ and dewatering process client's can produce a Class AA/EQ biosolids that may be registered as a commercial fertilizer in the State of Florida.

Not only can the output of such systems be utilized as fertilizer, there is a significant reduction in tipping fees related to the elimination of typical "cake" type waste (which in the case of City of Punta Gorda is not produced since the existing WWTP operations uses deep well injection and does not produce solid waste).

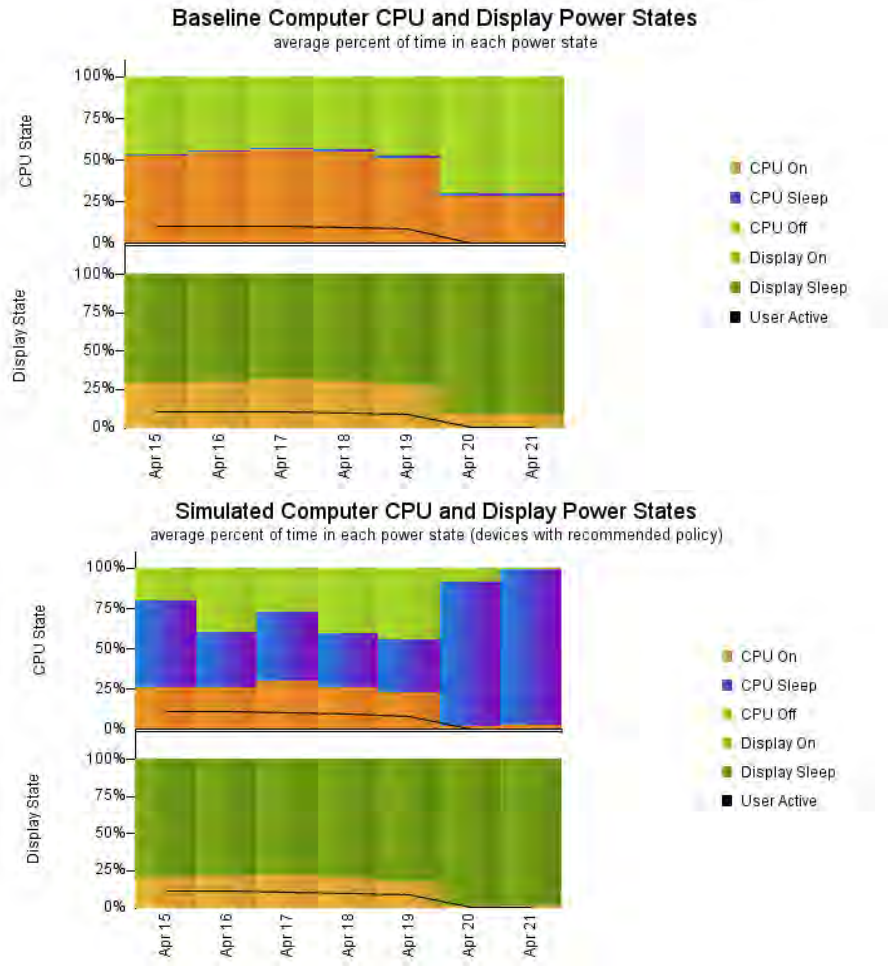
As such, the initial economic analysis showed insufficient financial benefit to the City to overcome the capital investment, therefore this ECM is not recommended.

PC Power Management

This ECM involves installation of a computer software system that will turn off computers that are not being used. Frequently, when computer monitors have screen savers enabled, the computers remain on even though users have left their workstation for an extended period. The proposed system will allow measurement, management, and reduction of power usage of the networked personal computers. The system is fully configurable and is completely transparent to the end users, which means there is no work interruption.

Network Computer Power Management Program

The City has less than 150 personal computers that have been identified as potential candidates for PC Power Management. Baseline measurements of the existing equipment power states were taken for a period of one week. A simulation was run with an operating schedule of Monday through Friday from 7 am to 4 pm daily using the power management software on the computers. See the graphs below.



ConEdison *Solutions* evaluated the option of including PC Power Management, however from the perspective of developing such projects typically there would be a much larger scale deployment, thereby contraindicating for the City any significant economic benefit. As such, ConEdison Solutions has removed the ECM from its recommendations.

Cool Roof

ConEdison *Solutions* analyzed the roofing system on the Public Works and Utilities Buildings. City staff indicated that since taking over both buildings a number of issues were found with the roofing system resulting in numerous leaks within each facility. ConEdison *Solutions* surveyed both roofing systems, identified several deficiencies and made recommendations that will correct existing issues and increase energy efficiency of the roof.

The existing roofing system is made of a flat surface area of

27,000 square feet and a vertical wall surface area of 22,000 square feet for each building respectively. The roofing systems are trapezoidal standing seam Galvalume® roof. Galvalume® is a substrate coating which uses a mixture of aluminum and zinc to protect against rust. The roofing material appears to be in good condition with minimal signs of degradation or damage. However, several installation deficiencies were identified which allows water penetration into the building. A number of these issues are highlighted below:

ConEdison *Solutions* evaluated the option of including a Cool Roof at the Public Works and Utilities buildings. At the request of the City, this project has been excluded from this project and will be performed under separate funding in order to allow the Energy Savings Performance Contract's identified savings to be utilized for need HVAC and controls infrastructure improvement projects.

City Hall Window Tinting

In response to a request to resolve a problem of hot zones along the Southwest corner of the building, ConEdison *Solutions* was asked to investigate window tinting as a possible solution. The most significant hurdle when applying window tint to these original wooden framed windows is that Winsulator brand internal storm windows were installed several years back. These storm windows will have to be removed, cleaned and reinstalled as part of the window tinting process.

ConEdison *Solutions* solicited two contractor bids to install window tinting. We provided the first with a written description, scope of work, and several pictures. This first contractor was not able to walk the project, but provided a quote resulting in a final cost exceeding $70,000 with overhead and markup.

The second contractor asked to bid the window tint did perform a project walk-through, but declined to provide pricing due to existing conditions. They did not want to remove and replace the Winsulators for fear of defacing the original wooden windows, framing and casework.

The projected payback for window tinting is insignificant compared to the estimated cost of installation. In addition, there is no guarantee that the window tinting will resolve the original issue of hot zones in the Southwest corner of the building. As such, ConEdison *Solutions* instead has developed a more direct solution for the issue of hot zones, which is a separate HVAC unit for the second floor southwest corner office. This solution is included as part of the project, but is included within the scope of the City Hall recommended infrastructure improvements. Please see page 43 for more information.

Other Measures (Hydroelectric, Photovoltaic, etc.)

There are several additional ECMs ConEdison *Solutions* was asked to evaluate which have been brought to the attention of some of the City Council members, including Compressed Natural Gas CNG (see page 58), hydroelectric at the WWTP, and photovoltaic electric generation technologies wherever applicable.

These measures were deemed by ConEdison *Solutions* to *presently* be unable to produce a satisfactory return on investment for the City. On the whole, Florida has some of the best (lowest) electric rates in the country. Because of that, energy measures that require high dollar capital investments (such as these three technologies mentioned) are *presently* unable to provide enough economic value without the use of significant financial incentives or grants, which is (again) presently unavailable in Florida. The word "presently" is emphasized

because the status of energy incentives or grants, as well as the baseline electric costs, are subject to significant change at any time. At the time of this IGA's writing, the State of Florida announced a grant and incentive program which will provide for funding for municipalities to invest in Compressed Natural Gas (CNG) vehicles and fueling facilities. However, that program is still in development and rules and processes will be announced most likely in the Fall of 2013.

ConEdison *Solutions*, being vendor and technology neutral, as well as objective and conservative in evaluating technology's impact on energy and cost savings, is a valuable partner in helping identify sound technology investments by the City.

Through the long term relationship of an Energy Savings Performance Contract, and as energy expert for the City, ConEdison *Solutions* remains available to assist the City of Punta Gorda at any time to evaluate the status of any of the ECMs not recommended in this audit as circumstances change over time.

ECMs To Be Considered for Additional Investigation

Water Meter Replacement / AMI Installation

Description

Water meters lose accuracy overtime. Water meters can be replaced with ultrasonic flow meters which do not lose accuracy over time, while simultaneously deploying Automatic Meter Infrastructure (AMI) technology.

Additionally, because new meters are being installed, meter repair costs and meter reading service costs can also be reduced and additional revenue can be gained. With age and wear, water meters lose their accuracy. This accuracy loss results in lower readings that do not fully recognize the total amount of water flowing through the meter. This results in lost revenue to the utility. Revenue can be increased by installing new accurate meters as opposed to the existing units. Recently, water meter manufacturers have redesigned their product to measure water flow using ultrasonic technology which requires no moving parts. Essentially, this means the meters do no lose accuracy over time like current mechanical water meters.

What is AMI?

AMI or Advanced Metering Infrastructure typically refers to the full measurement and collection system that includes meters at the customer site, communication networks between the customer and the water utility, and data reception and management systems that make the information available to the water utility. Advanced metering Infrastructure comprises of state-of-the-art electronic/digital hardware and software, which combine interval data measurement with continuously available remote communications. These systems enable measurement of detailed, time-based information and frequent collection and transmittal of such information to various parties.

Preliminary Estimates

The preliminary estimate of cost is based on providing and installing new ultrasonic water meters and AMI system for the City of Punta Gorda. ConEdison *Solutions* estimates that to replace all 11,932 water meters and deploy an AMI network would cost between $3.5M to 3.9M dollars. Based on the City of Punta Gorda FY11 water revenue and data provided by the Utilities department ConEdison projects that the City would see a revenue increase of approximately $203,989 due to water meter accuracy increase (assumes a 3% accuracy increase). In addition to these savings additional operational and maintenance savings exist which have yet to be quantified.

The preliminary pro forma below shows the potential to fund these upgrades using a performance contract as the funding mechanism.

YEAR	Calculated Revenue Increase	Meter Replacement Program Budget Reallocation	Operation & Maintenance Savings	Total Annual Benefit	Annual Debt Service	Ongoing Verification Services
Install	$ -	$ 50,000	$ 60,000	$ 110,000	$ -	$ -
1	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
2	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
3	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
4	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
5	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
6	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
7	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
8	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
9	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
10	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
11	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
12	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
13	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
14	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
15	$ 203,989	$ 50,000	$ 60,000	$ 313,989	$ (316,963)	$ (35,000)
Totals	**$ 2,116,867**	**$ 800,000**	**$ 960,000**	**$ 4,819,836**	$ (4,754,440)	$ (525,000)

Savings Calculation Methodology

The savings for this ECM is calculated using additional revenue generated from using more accurate meters and well as quantifiable operational and maintenance savings. It is emphasized that the above economic evaluation is only for illustrative purposes, and are not intended to represent applicability for the City of Punta Gorda.

Specific analysis would be developed in conjunction with City subject matter experts, and included substantive testing of existing equipment in place, and would also involve staff and management in the testing of optional AMI/AMR vendors and equipment in order to identify the most viable, economic solution for the City.

Measurement and Verification

There are several primary methods for measuring energy saving measures as defined by the International Performance Measurement and Verification Protocol (IPMVP). IPMVP is the industry accepted standard guideline for performing measurement and verification. Each one is applicable to different risk sharing scenarios, different project values, and different types of contracts. For this project CES recommends using Option A and Option D. What follows is a brief description of the two options:

Option A: Partially Measured Retrofit Isolation is designed for retrofits where end-use "efficiency" or power draw can be measured or stipulated using manufacturers' performance specifications or one time measurements. Estimated or stipulated energy consumption is calculated by multiplying manufacturers' information or measured variable times the stipulated hours of operation for each period of operation. Some of the best applications for this option are individual loads or systems within a building, where energy usage can be broken down to one or two primary, straightforward parameters. As part of the contract, both parties must agree up front that the mainly stipulated parameters are reasonable, realistic and accurate, and may only be changed by a mutually agreed upon modification to the contract.

Option D: Calibrated Simulation involves determining energy savings during the performance period using calibrated building simulation tools. Savings determined through Option D is intended for energy conservation retrofits where calibrated simulations of the baseline energy use and/or calibrated simulations of the post-installation energy consumption are used to measure project savings. Option D may involve measurements of energy use before and after the retrofit for specific equipment or energy end-use, as required for proper calibration of the simulation program. Periodic inspections of the equipment may also be warranted. Energy consumption is calculated by developing simulation models of whole-building energy use, or equipment subsystems. This is done in both the baseline mode and in the post-installation mode. Comparisons can then be made for the (simulated) differences for a "typical" weather year, or for weather and operating conditions that correspond to a specific year during either the baseline or post-installation period.

Any requests by the City of Punta Gorda for modifications to the models' assumptions, set points, sequences of operation, or equipment efficiencies have been incorporated into the models and both parties agree that the models as included in this IGA are reasonable representations of actual current and expected future energy use of the buildings. Annual savings will be calculated using the calibrated simulation of building equipment before and after the measures are installed.

The table below summarizes each ECM's Measurement and Verification (M&V) approach:

ECM	Description	M&V Approach
1	Lighting Upgrades	A
2	Street Lighting	A
3	Mechanical Upgrades	D
4	Energy Management Control System	D
5	Ice Machine Heat Exchangers	D
6	Vending Machine Controls	D

ECM 1 – Lighting Improvements and Controls

The proposed measurement and verification approach for this ECM is the IPMVP Option A.

The performance of the ECM shall be supported by the Measured Capacity data obtained before and after retrofit. A power meter will be utilized to measure the connected electrical load in Kilowatts, of representative types of fixtures. At least (3) measurements of (6) different types of fixture to be replaced/ retrofitted shall be made to obtain a statistical average. Fixtures that cannot be easily measured shall be stipulated. The measurements shall be taken one time and shall be stipulated for the remainder of the contract.

The hours of operation shall be stipulated. The stipulated hours of operation are displayed in the Lighting Audit Appendix at the end of this report. As long as the occupancy sensors are operational at the time of inspection, the measure will be deemed as performing. This information shall be utilized as the basis for the annual hours of operation agreed-upon according to IPMVP Option A.

ECM 2 – Street Lighting Retrofit

The proposed measurement and verification approach for this ECM is the IPMVP Option A.

The performance of the ECM shall be supported by the Measured Capacity data obtained before and after retrofit. A power meter will be utilized to measure the connected electrical load in Kilowatts, of representative types of fixtures. At least (3) measurements of each different type of fixture to be replaced/ retrofitted shall be made to obtain a statistical average. Fixtures that cannot be easily measured shall be stipulated. The measurements shall be taken one time and shall be stipulated for the remainder of the contract.

ECM 3 – Mechanical Upgrades

The proposed measurement and verification approach for this ECM is the IPMVP Option D.

CES shall commission the new equipment, associated controls and sequence of operations one time at the completion of construction. As long as the equipment and controls are maintained as per the manufacturer's instructions and the sequences remain unchanged, this ECM shall be deemed as performing.

ECM 4 – EMCS Upgrades

The proposed measurement and verification approach for this ECM is the IPMVP Option D.

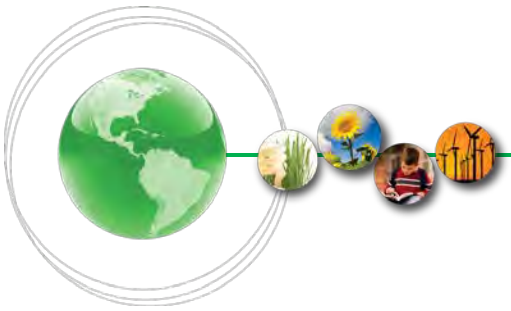
CES shall commission the new controls and sequence of operations, and calibrate CO2 sensors, set space temperature setpoints one time at the completion of construction. As long as the facility ensures that the CO2 sensors are calibrated and thermostat setpoints and schedules are maintained, this ECM will be deemed as performing.

ECM 5 – Ice Machine Heat Exchangers

The proposed measurement and verification approach for this ECM is the IPMVP Option D.

ECM 6 – Vending Machine Controls

The proposed measurement and verification approach for this ECM is the IPMVP Option D.



Utility Incentives

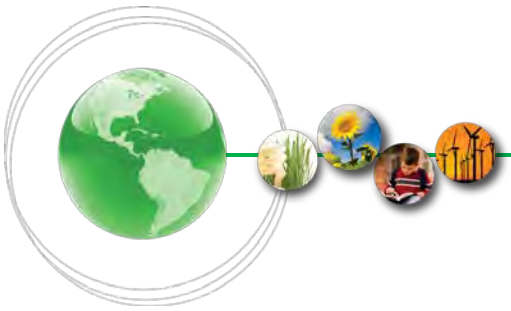
ConEdison *Solutions* contacted Florida Power & Light during the course of this investment grade audit in order to determine what utility incentives the City of Punta Gorda will qualify for as a result of implementing the recommended energy conservation measures. ConEdison *Solutions* project management team will provide all the necessary documentation and administrative support necessary to qualify and apply for FPL Energy Efficiency Programs and Incentives.

FPL incentives are available for the following ECMs in scope:

- Interior Lighting Improvements
- HVAC DX Equipment Replacement

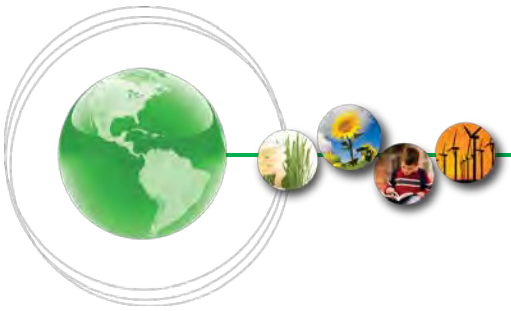
It is estimated that approximately $2,150 in existing rebate program incentives are currently available from FPL for implementing these ECMs. In addition to these standard rebates, ConEdison *Solutions* will apply for customized rebates from FPL for the Exterior Lighting, Herald Street Parking Garage Project and Street Lighting Project.

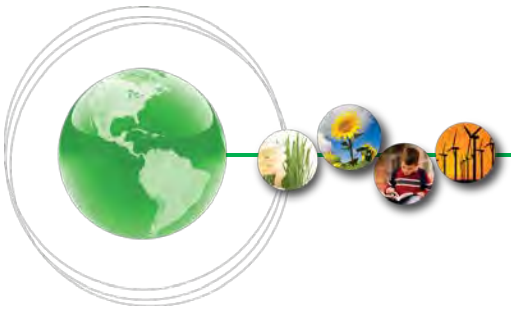
In as much as the incentives are provided by FPL, no guarantee is made by ConEdison *Solutions* that these estimated incentives and rebates will be in place following implementations of the ECMs, nor can the actual values be known until application is made. However, in calculating paybacks and the financial performance of the project, these funds are not assumed to exist. ConEdison Solutions will work with the City to maximize the amount of the then available rebates, the entire amount of which would be paid directly to the City by the utility.



Project Schedule

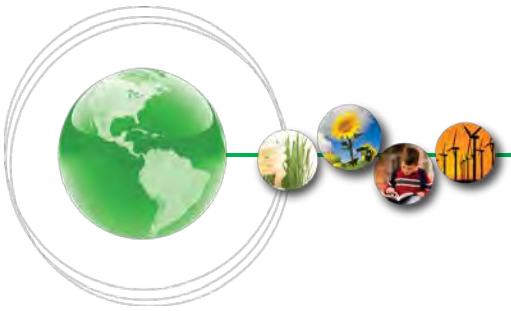
A project schedule will be provided when the final scope of work is determined by the City of Punta Gorda.





Financial Analysis

The table on the following page lists the proposed Energy Conservation Measures with associated costs and savings for the City of Punta Gorda. The utility savings are verified by the measurement and verification protocol as defined for each ECM. Operational savings are projected calculations with assumptions that have been agreed upon by the City and are not guaranteed.



ALL ENERGY CONSERVATION MEASURES
ECM Master*Plan*
City of Punta Gorda

ECM #	ECM DESCRIPTION	TOTAL PROJECT COST	ESTIMATED UTILITY REBATE	ANNUAL PROJECT SAVINGS	SIMPLE PAYBACK (YEARS)	TOTAL ANNUAL UTILITY SAVINGS	ANNUAL OPERATIONAL COST SAVINGS				AVERAGE ANNUAL CAPITAL AVOIDED COST	TOTAL ANNUAL OPER., SUB AND CAPITAL COST SAVINGS
							MATERIAL	SUBCONTRACTOR	LABOR			
									HRS	$		
Lighting Upgrades												
1.1	Lighting Upgrades- Interior Lighting All City Buildings	$118,125	$1,550	$15,358	9.2	$13,260	$2,099					$ 2,099
1.2	Lighting Upgrades- Exterior Lighting All City Buildings	$34,375		$3,534	11.8	$2,997	$537					$ 537
1.3	Lighting Upgrades- WTP & WWTP	$132,813	$600	$13,574	11.8	$11,214	$2,360					$ 2,360
1.4b	Lighting Upgrade- Herald Street Parking Garage- LED	$67,994		$10,796	7.6	$10,296	$500					$ 500
2.1b	Street & Park Lighting Improvements - LED Retrofit /Metered	$246,640		$16,128	18.5	$15,092	$1,036					$ 1,036
Mechanical & EMCS Upgrades												
3.1	HVAC Upgrades- City Hall	$79,338		$2,060	46.6	$2,060						
4.1	EMCS- City Hall	$11,375		$1,084	12.7	$1,084						
3.2	HVAC Upgrades- City Hall Annex	$86,188		$4,053	25.7	$4,053						
4.2	EMCS- City Hall Annex	$3,513			NA							
3.3	HVAC Upgrades- Fire Station 3	$21,088		$627	40.7	$627						
3.4	HVAC Upgrades & TAB Services- Public Safety Bldg	$124,125		$1,545	97.1	$1,545						
4.3	EMCS- Public Safety	$37,900		$2,401	19.1	$2,401						
4.4	EMCS- Bayfront Center	$8,438		$866	11.8	$866						
4.5	EMCS- Laishley Park Marina Bldg	$6,750		$130	62.8	$130						
4.6	EMCS- Cooper Street Recreation Center	$3,875		$378	12.4	$378						
4.7	EMCS- Public Works/Utilities	$3,375		$998	4.1	$998						
Ice Machines Heat Exchangers												
5	Ice Machines throughout the City	$4,028		$1,010	4.8	$1,010						
Vending Machines Controls												
6	Vending Machines- City Hall & Laishley Marina	$670		$447	1.8	$447						
Subtotal		$990,607										
Project Implementation												
	Contingency	$43,280										
	General Conditions	$22,232										
	Training	$10,400										
	Commissioning	$15,886										
	Project Management	$53,950										
	Engineering	$28,340										
	M & V	$15,600										
	Insurance & Bonds	$11,859										
	TOTALS	**$1,192,154**	**$2,150**	**$74,989**	**15.9**	**$68,458**	**$6,531**					**$ 6,531**

Appendix Table of Contents

This document was prepared for double-sided printing.

Appendix A - Lighting

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Fire Station 2	TRUCK BAY	TRUCK BAY	Truck Bay	1x4 Vapor Tight - T8	4	87	Relamp & reballast fixture with (3) 28w T8 lamps and LP Elec. Ballast	4	67	1,043	1,043	0.08	83.4	0.0	none
Facilities - Interior	Fire Station 2	TRUCK BAY	TRUCK BAY	Truck Bay	HID Metal Halide - Recessed Can	2	288	Retrofit fixture with 150w Induction Kit - fixture optics & lens to remain as is	2	163	1,043	1,043	0.25	260.7	0.0	none
Facilities - Interior	Fire Station 2	LAUNDRY	LAUNDRY	Fire Station Utility Areas	1x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	365	365	0.03	12.4	0.0	Existing Occ Sensors
Facilities - Interior	Fire Station 2	BUNKER RM	BUNKER RM	Fire Station Utility Areas	1x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	521	365	0.03	17.7	13.1	Wall Switch
Facilities - Interior	Fire Station 2	BUNKER RM	BUNKER RM	Fire Station Utility Areas	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 2	HALL	HALL	Fire Station Living Areas	2x4 Rec. Acrylic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	2,607	0.16	406.7	0.0	none
Facilities - Interior	Fire Station 2	W. RESTROOM	W. RESTROOM	Restrooms	1x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	1,825	1,825	0.02	31.0	0.0	Existing Occ Sensors
Facilities - Interior	Fire Station 2	M. RESTROOM	M. RESTROOM	Restrooms	1x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Fire Station 2	M. RESTROOM	M. RESTROOM	Restrooms	1x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	1,825	1,825	0.02	31.0	0.0	Existing Occ Sensors
Facilities - Interior	Fire Station 2	MECH	MECH	Elec / Mech	1X4 Strip - T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	3	42	521	521	0.05	26.6	0.0	none
Facilities - Interior	Fire Station 2	BUNK RM	BUNK RM	Fire Station Bunk Area	2x4 Rec. Acrylic - T8	1	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	1	48	1,460	1,460	0.04	56.9	0.0	none
Facilities - Interior	Fire Station 2	WATER HEATER	WATER HEATER	Elec / Mech	1X4 Strip - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	521	521	0.02	8.9	0.0	none
Facilities - Interior	Fire Station 2	WEIGHT ROOM	WEIGHT ROOM	Fire Station Living Areas	2x4 Rec. Acrylic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Ceiling/Corner
Facilities - Interior	Fire Station 2	WEIGHT ROOM	WEIGHT ROOM	Fire Station Living Areas	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 2	WEIGHT ROOM	WEIGHT ROOM	Fire Station Living Areas	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 2	STORAGE	STORAGE	Fire Station Storage	2x4 Rec. Acrylic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	521	365	0.08	40.7	15.0	Wall Switch
Facilities - Interior	Fire Station 2	STORAGE	STORAGE	Fire Station Storage	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 2	HALL	HALL	Hall / Corridor	2x4 Rec. Acrylic - T8	1	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	1	48	2,607	2,607	0.04	101.7	0.0	none
Facilities - Interior	Fire Station 2	LOUNGE	LOUNGE	Fire Station Living Areas	Compact Fluorescent - Rec Can 8	1	26	Exclude existing Compact Fluorescent fixture	1	26	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 2	HALL	HALL	Hall / Corridor	2x4 Rec. Acrylic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	2,607	0.08	203.4	0.0	none
Facilities - Interior	Fire Station 2	KITCHEN	KITCHEN	Fire Station Living Areas	2x4 Rec. Acrylic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	2,607	0.08	203.4	0.0	none
Facilities - Interior	Fire Station 2	HALL	HALL	Hall / Corridor	2x4 Rec. Acrylic - T8	1	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	1	48	2,607	2,607	0.04	101.7	0.0	none
Facilities - Interior	Fire Station 2	UNISEX RR	UNISEX RR	Restrooms	1x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	1,825	1,825	0.02	31.0	0.0	Existing Occ Sensors
Facilities - Interior	Fire Station 2	HALL	HALL	Hall / Corridor	2x2 Rec. Troffer - T8 F17	3	51	Relamp & Reballast fixture with (3) F17T8 lamps and Elec. Ballast	3	46	2,607	2,607	0.02	39.1	0.0	none
Facilities - Interior	Fire Station 2	DISPATCH	DISPATCH	Office / Admin Area	2x4 Rec. Acrylic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	2,607	0.08	203.4	0.0	none
Facilities - Interior	Fire Station 2	POLICE AREA	POLICE AREA	Open Area - rarely used	2x4 Rec. Acrylic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	521	365	0.16	81.3	30.0	Ceiling/Corner
Facilities - Interior	Fire Station 2	POLICE AREA	POLICE AREA	Open Area - rarely used	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 2	POLICE AREA	POLICE AREA	Open Area - rarely used	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 2	POLICE RR	POLICE RR	Open Area - rarely used	1x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	521	365	0.02	8.9	6.6	Wall Switch
Facilities - Interior	Fire Station 2	POLICE RR	POLICE RR	Open Area - rarely used	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	LOBBY	LOBBY	Lobby / Vestibule	2x4 Rec. Parabolic T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Public Works 3132	LOBBY	LOBBY	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	RECEPTION	RECEPTION	Office / Admin Area	2x2 Rec. Acrylic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	RECEPTION	RECEPTION	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	RECEPTION STR	RECEPTION STR	Storage / Closet	2x2 Rec. Parabolic - T8 (F17)	2	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	2	30	2,607	1,825	0.01	20.9	46.9	Wall Switch

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Works 3132	RECEPTION STR	RECEPTION STR	Storage / Closet	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	UTILITY DIR.	UTILITY DIR.	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	UTILITY DIR.	UTILITY DIR.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	CONF. RM	CONF. RM	Confernece	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	CONF. RM	CONF. RM	Confernece	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	WW SUPV	WW SUPV	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	WW SUPV	WW SUPV	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	PLAN AREA	PLAN AREA	Open Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Ceiling/Corner
Facilities - Interior	Public Works 3132	PLAN AREA	PLAN AREA	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	PLAN AREA	PLAN AREA	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	W.RESTROOM	W.RESTROOM	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Works 3132	W. RESTROOM	W. RESTROOM	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	M. RESTROOM	M. RESTROOM	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Works 3132	M. RESTROOM	M. RESTROOM	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Hall / Corridor	2x2 Rec. Parabolic - T8 (F17)	5	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	5	30	2,607	2,607	0.02	52.1	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	BREAK AREA	BREAK AREA	Break / Lounge	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Ceiling/Corner
Facilities - Interior	Public Works 3132	BREAK AREA	BREAK AREA	Break / Lounge	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	TRAINING RM	TRAINING RM	Classroom / Training Room	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Ceiling/Corner
Facilities - Interior	Public Works 3132	TRAINING RM	TRAINING RM	Classroom / Training Room	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	TRAINING RM	TRAINING RM	Classroom / Training Room	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	CLOSET	CLOSET	Storage / Closet	Compact Fluorecent	1	16	Exclude existing Compact Fluorescent fixture	1	16	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	TELE	TELE	Elec / Mech	2x2 Rec. Parabolic - T8 (F17)	1	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	1	30	521	521	0.00	2.1	0.0	none
Facilities - Interior	Public Works 3132	W.RESTROOM	W.RESTROOM	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Works 3132	W.RESTROOM	W.RESTROOM	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	M. RESTROOM	M. RESTROOM	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Works 3132	M. RESTROOM	M. RESTROOM	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Hall / Corridor	2x4 Rec. Parabolic T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	3	42	2,607	2,607	0.05	133.0	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Hall / Corridor	2x2 Rec. Acrylic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	2,607	0.02	41.7	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Exit / Emergency	Exit Sign - LED	2	3	Exclude LED Exit Sign	2	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	WT DIRECTOR	WT DIRECTOR	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	WT DIRECTOR	WT DIRECTOR	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	WT. PROJ.MAN	WT. PROJ.MAN	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	WT. PROJ.MAN	WT. PROJ.MAN	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	CONF. RM	CONF. RM	Confernece	2x4 Rec. Parabolic T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	Wall Switch

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Works 3132	CONF. RM	CONF. RM	Confernece	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	VACANT OFF.	VACANT OFF.	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	VACANT OFF.	VACANT OFF.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	W.DISTRB.SUPV.	W.DISTRB.SUPV.	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	W.DISTRB.SUPV.	W.DISTRB.SUPV.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	UTILITY OPS	UTILITY OPS	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	UTILITY OPS	UTILITY OPS	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	FILE RM	FILE RM	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	2	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	2	30	2,607	1,825	0.01	20.9	46.9	Wall Switch
Facilities - Interior	Public Works 3132	FILE RM	FILE RM	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Hall / Corridor	2x2 Rec. Parabolic - T8 (F17)	3	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	3	30	2,607	2,607	0.01	31.3	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	PRINTER	PRINTER	Open Area	2x2 Rec. Parabolic - T8 (F17)	3	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	3	30	2,607	2,607	0.01	31.3	0.0	none
Facilities - Interior	Public Works 3132	PRINTER	PRINTER	Open Area	Compact Fluorecent	2	32	Exclude existing Compact Fluorescent fixture	2	32	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	WW COLLECTION	WW COLLECTION	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3132	WW COLLECTION	WW COLLECTION	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Hall / Corridor	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	2,607	0.02	41.7	0.0	none
Facilities - Interior	Public Works 3132	HALL	HALL	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	103 OPEN	103 OPEN	Open Area	2x4 Rec. Parabolic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Ceiling/Corner
Facilities - Interior	Public Works 3132	103 OPEN	103 OPEN	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	103 OPEN	103 OPEN	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	103 OPEN	103 OPEN	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	103 RR	103 RR	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch
Facilities - Interior	Public Works 3132	103 RR	103 RR	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	104 OPEN	104 OPEN	Open Area	2x4 Rec. Acrylic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Ceiling/Corner
Facilities - Interior	Public Works 3132	104 OPEN	104 OPEN	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	104 OPEN	104 OPEN	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	104 W. LOCKER	104 W. LOCKER	Locker Room	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	DTS
Facilities - Interior	Public Works 3132	104 W. LOCKER	104 W. LOCKER	Locker Room	Compact Fluorecent	1	16	Exclude existing Compact Fluorescent fixture	1	16	2,607	1,825	0.00	0.0	12.5	DTS
Facilities - Interior	Public Works 3132	104 M. LOCKER	104 M. LOCKER	Locker Room	1X4 Wrap - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	DTS
Facilities - Interior	Public Works 3132	104 W. LOCKER	104 W. LOCKER	Locker Room	Compact Fluorecent	1	16	Exclude existing Compact Fluorescent fixture	1	16	2,607	1,825	0.00	0.0	12.5	DTS
Facilities - Interior	Public Works 3132	104 M. LOCKER	104 M. LOCKER	Locker Room	1X4 Wrap - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	DTS
Facilities - Interior	Public Works 3132	104 M. LOCKER	104 M. LOCKER	Locker Room	Wall Switch	1	0	Install Digital Timer	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	104 M. LOCKER	104 M. LOCKER	Locker Room	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	DTS
Facilities - Interior	Public Works 3132	105 OPEN	105 OPEN	Open Area	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Ceiling/Corner
Facilities - Interior	Public Works 3132	105 OPEN	105 OPEN	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Works 3132	105 OPEN	105 OPEN	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	104 W. LOCKER	104 W. LOCKER	Locker Room	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Public Works 3132	104 W. LOCKER	104 W. LOCKER	Locker Room	Compact Fluorecent	1	16	Exclude existing Compact Fluorescent fixture	1	16	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	104 M. LOCKER	104 M. LOCKER	Locker Room	1X4 Wrap - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Wall Switch
Facilities - Interior	Public Works 3132	104 M. LOCKER	104 M. LOCKER	Locker Room	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	104 M. LOCKER	104 M. LOCKER	Locker Room	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Public Works 3132	105 OPEN	105 OPEN	Open Area	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Ceiling/Corner
Facilities - Interior	Public Works 3132	105 OPEN	105 OPEN	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	105 OPEN	105 OPEN	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	105 OPEN	105 OPEN	Exit / Emergency	HID HPS	1	135	Exclude LED Exit Sign	1	3	8,760	8,760	0.13	1,156.3	0.0	none
Facilities - Interior	Public Works 3132	105 M. LOCKER	105 M. LOCKER	Locker Room	1X4 Wrap - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Wall Switch
Facilities - Interior	Public Works 3132	105 M. LOCKER	105 M. LOCKER	Locker Room	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	105 M. SHOWER	105 M. SHOWER	Locker Room	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	Wall Switch
Facilities - Interior	Public Works 3132	105 M. SHOWER	105 M. SHOWER	Locker Room	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	105 RR	105 RR	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	2,607	0.02	44.3	0.0	none
Facilities - Interior	Public Works 3132	106 OPEN	106 OPEN	Open Area	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Ceiling/Corner
Facilities - Interior	Public Works 3132	106 OPEN	106 OPEN	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	106 OPEN	106 OPEN	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	106 OPEN	106 OPEN	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	106 RR	106 RR	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Works 3132	106 RR	106 RR	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	107 POLICE/FIRE	107 POLICE/FIRE	Storage / Closet	2x4 Rec. Acrylic - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	DTS
Facilities - Interior	Public Works 3132	107 POLICE/FIRE	107 POLICE/FIRE	Storage / Closet	Wall Switch	1	0	Install Digital Timer	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	107 POLICE/FIRE	107 POLICE/FIRE	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	108 URBAN DES.	108 URBAN DES.	Storage / Closet	2x4 Rec. Acrylic - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	DTS
Facilities - Interior	Public Works 3132	108 URBAN DES.	108 URBAN DES.	Storage / Closet	Wall Switch	1	0	Install Digital Timer	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	108 URBAN DES.	108 URBAN DES.	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	109 UTILITY TR	109 UTILITY TR	Open Area	2x4 Rec. Acrylic - T8	8	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	8	48	2,607	1,825	0.31	813.4	300.3	Ceiling/Corner
Facilities - Interior	Public Works 3132	109 UTILITY TR	109 UTILITY TR	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	109 UTILITY TR	109 UTILITY TR	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	109 UTILITY TR	109 UTILITY TR	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	109 RR	109 RR	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	2,607	0.13	338.9	0.0	none
Facilities - Interior	Public Works 3132	GEN STR	GEN STR	Warehouse	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,868	2,008	0.17	487.5	361.4	DTS
Facilities - Interior	Public Works 3132	GEN STR	GEN STR	Warehouse	Wall Switch	1	0	Install Digital Timer	1	0	2,868	2,868	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	GEN STR	GEN STR	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Works 3132	POLICE EVIDENCE	POLICE EVIDENCE	Warehouse	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,868	2,008	0.17	487.5	361.4	DTS
Facilities - Interior	Public Works 3132	POLICE EVIDENCE	POLICE EVIDENCE	Warehouse	Wall Switch	1	0	Install Digital Timer	1	0	2,868	2,868	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	POLICE EVIDENCE	POLICE EVIDENCE	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	110	110	Storage / Closet	2x4 Rec. Acrylic - T8	8	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	8	42	2,607	1,825	0.14	354.6	262.8	DTS
Facilities - Interior	Public Works 3132	110	110	Storage / Closet	Wall Switch	1	0	Install Digital Timer	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	110	110	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	PARKS STORAGE	PARKS STORAGE	Warehouse	1x8 Strip - T8	8	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	8	84	2,868	2,008	0.27	780.1	578.2	DTS
Facilities - Interior	Public Works 3132	PARKS STORAGE	PARKS STORAGE	Warehouse	Wall Switch	1	0	Install Digital Timer	1	0	2,868	2,868	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	PARKS STORAGE	PARKS STORAGE	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	POLICE/FIRE	POLICE/FIRE	Warehouse	1x8 Strip - T8	8	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	8	84	2,868	2,008	0.27	780.1	578.2	DTS
Facilities - Interior	Public Works 3132	POLICE/FIRE	POLICE/FIRE	Warehouse	Wall Switch	1	0	Install Digital Timer	1	0	2,868	2,868	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	POLICE/FIRE	POLICE/FIRE	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	103	103	Warehouse	1x8 Strip - T8	8	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	8	84	2,868	2,868	0.27	780.1	0.0	none
Facilities - Interior	Public Works 3132	103	103	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	104	104	Warehouse	1x8 Strip - T8	7	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	7	84	2,868	2,868	0.24	682.6	0.0	none
Facilities - Interior	Public Works 3132	104	104	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	105	105	Shop	1x8 Strip - T8	7	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	7	84	2,607	1,825	0.24	620.5	459.9	Ceiling/Corner
Facilities - Interior	Public Works 3132	105	105	Shop	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	105	105	Shop	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	105	105	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3132	106	106	Warehouse	1x8 Strip - T8	8	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	8	84	2,868	2,868	0.27	780.1	0.0	none
Facilities - Interior	Public Works 3132	106	106	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall	COUNCIL RM	COUNCIL RM	Open Area	2X4 Rec. Parabolic	6	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	6	64	2,607	1,825	0.48	1,251.4	300.3	Ceiling/Corner
Facilities - Interior	City Hall	COUNCIL RM	COUNCIL RM	Open Area	Incandescent - Recessed Can Dim	17	75	Retrofit existing recessed can fixture with 10w LED Downlight Retrofit Kit 6"	17	10	2,607	1,825	1.11	2,880.9	133.0	Ceiling/Corner
Facilities - Interior	City Hall	COUNCIL RM	COUNCIL RM	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	COUNCIL RM	COUNCIL RM	Open Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	HALL	HALL	Hall / Corridor	2X2 Rec. Acrylic	6	72	Retrofit fixture with (2) 2' 17w lamps, Elec. Ballast and Reflector Kit	6	30	2,607	2,607	0.25	657.0	0.0	none
Facilities - Interior	City Hall	CONF. RM	CONF. RM	Confernece	2X4 Rec. Acrylic	4	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	4	64	2,607	2,607	0.30	771.7	0.0	none
Facilities - Interior	City Hall	CONF. RM	CONF. RM	Confernece	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	MENS RR	MENS RR	Restrooms	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	2	48	1,825	1,825	0.18	328.5	0.0	Existing Occ Sensors
Facilities - Interior	City Hall	CLOSET	CLOSET	Storage / Closet	1X4 Wrap	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	2,607	0.03	78.2	0.0	none
Facilities - Interior	City Hall	WOMENS RR	WOMENS RR	Restrooms	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	2	48	2,607	1,825	0.18	469.3	75.1	Wall Switch
Facilities - Interior	City Hall	WOMENS RR	WOMENS RR	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	COPY RM	COPY RM	Office / Admin Area	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	2	64	2,607	1,825	0.15	385.9	100.1	Wall Switch
Facilities - Interior	City Hall	COPY RM	COPY RM	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	City Hall	HALL	HALL	Hall / Corridor	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	2	48	2,607	2,607	0.18	469.3	0.0	none
Facilities - Interior	City Hall	MOTE AQ	MOTE AQ	Open Area	2X4 Rec. Acrylic	5	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	5	64	2,607	1,825	0.37	964.6	250.3	Ceiling/Corner
Facilities - Interior	City Hall	MOTE AQ	MOTE AQ	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	MOTE AQ	MOTE AQ	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	MOTE AQ #1	MOTE AQ #1	Office / Admin Area	2X4 Rec. Acrylic	2	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.06	156.4	65.7	Wall Switch
Facilities - Interior	City Hall	MOTE AQ #1	MOTE AQ #1	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	MOTE AQ #2	MOTE AQ #2	Office / Admin Area	2X4 Rec. Acrylic	3	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	3	64	2,607	1,825	0.22	578.8	150.2	Wall Switch
Facilities - Interior	City Hall	MOTE AQ #2	MOTE AQ #2	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	ENTRY	ENTRY	Open Area	2X4 Rec. Acrylic	3	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	3	64	2,607	1,825	0.22	578.8	150.2	Wall Switch
Facilities - Interior	City Hall	ENTRY	ENTRY	Open Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	VIDEO RM	VIDEO RM	Storage / Closet	Incandescent - Keyless	1	60	Relamp fixture with 15w CFL Screw In	1	15	2,607	2,607	0.05	117.3	0.0	none
Facilities - Interior	City Hall	MECH RM	MECH RM	Elec / Mech	1x4 Industrial - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	521	521	0.02	8.9	0.0	none
Facilities - Interior	City Hall	MAIL RM	MAIL RM	Office / Admin Area	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	2	64	2,607	1,825	0.15	385.9	100.1	Ceiling/Corner
Facilities - Interior	City Hall	MAIL RM	MAIL RM	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	MAIL RM	MAIL RM	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	BREAK RM	BREAK RM	Break / Lounge	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	2	48	2,607	1,825	0.18	469.3	75.1	Wall Switch
Facilities - Interior	City Hall	BREAK RM	BREAK RM	Break / Lounge	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	CITY CLERK	CITY CLERK	Open Area	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	2	64	2,607	1,825	0.15	385.9	100.1	Ceiling/Corner
Facilities - Interior	City Hall	CITY CLERK	CITY CLERK	Open Area	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	CITY CLERK	CITY CLERK	Open Area	Wall Switch	3	0	Install Occupancy Sensor Power Pack	3	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	VAULT	VAULT	Storage / Closet	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	2	48	2,607	2,607	0.18	469.3	0.0	none
Facilities - Interior	City Hall	CITY CLERK	CITY CLERK	Office / Admin Area	2X4 Rec. Acrylic	2	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	2	64	2,607	2,607	0.15	385.9	0.0	none
Facilities - Interior	City Hall	CITY CLERK	CITY CLERK	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	HALL	HALL	Hall / Corridor	2X4 Rec. Acrylic	1	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	1	48	2,607	2,607	0.09	234.6	0.0	none
Facilities - Interior	City Hall	MAP HALL	MAP HALL	Hall / Corridor	2X4 Rec. Acrylic	1	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	1	48	2,607	2,607	0.09	234.6	0.0	none
Facilities - Interior	City Hall	MARY KELLY	MARY KELLY	Office / Admin Area	2X4 Rec. Acrylic	3	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	3	64	2,607	1,825	0.22	578.8	150.2	Ceiling/Corner
Facilities - Interior	City Hall	MARY KELLY	MARY KELLY	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	MARY KELLY	MARY KELLY	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	CLERK OFFICE	CLERK OFFICE	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall	CLERK OFFICE	CLERK OFFICE	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	CLERK OFFICE	CLERK OFFICE	Office / Admin Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	1ST FLOOR LOBBY	1ST FLOOR LOBBY	Hall / Corridor	Compact Fluorescent - 3 lamp	3	39	Exclude existing Compact Fluorescent fixture	3	39	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	2ND FLOOR HALL	2ND FLOOR HALL	Hall / Corridor	Compact Fluorescent - 3 lamp	5	39	Exclude existing Compact Fluorescent fixture	5	39	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	STAIRS	STAIRS	Stairs	Compact Fluorescent - 3 lamp	1	39	Exclude existing Compact Fluorescent fixture	1	39	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall	MENS RR	MENS RR	Restrooms	Compact Fluorescent - 5 lamp	2	73	Exclude existing Compact Fluorescent fixture	2	23	2,607	2,607	0.10	260.7	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	City Hall	FINANCE	FINANCE	Open Area	Compact Fluorescent - 5 lamp	5	73	Exclude existing Compact Fluorescent fixture	5	23	2,607	2,607	0.25	651.8	0.0	none
Facilities - Interior	City Hall	DIRECTOR	DIRECTOR	Office / Admin Area	Compact Fluorescent - 5 lamp	6	73	Exclude existing Compact Fluorescent fixture	6	23	2,607	2,607	0.30	782.1	0.0	none
Facilities - Interior	City Hall	FINANCE	FINANCE	Open Area	Compact Fluorescent - 5 lamp	6	73	Exclude existing Compact Fluorescent fixture	6	23	2,607	2,607	0.30	782.1	0.0	none
Facilities - Interior	City Hall	TELE/FIRE	TELE/FIRE	Elec / Mech	2X4 Rec. Acrylic	1	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	1	48	521	521	0.09	46.9	0.0	none
Facilities - Interior	City Hall	WOMENS RR	WOMENS RR	Restrooms	Compact Fluorescent - 3 lamp	2	39	Exclude existing Compact Fluorescent fixture	2	39	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	DEBBIE JONES	DEBBIE JONES	Office / Admin Area	Compact Fluorescent - 5 lamp	4	73	Exclude existing Compact Fluorescent fixture	4	23	2,607	2,607	0.20	521.4	0.0	none
Facilities - Interior	City Hall	FINANCE ?	FINANCE ?	Office / Admin Area	Compact Fluorescent - 5 lamp	4	73	Exclude existing Compact Fluorescent fixture	4	23	2,607	2,607	0.20	521.4	0.0	none
Facilities - Interior	City Hall	FINANCE ?	FINANCE ?	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall	FINANCE "	FINANCE "	Office / Admin Area	Compact Fluorescent - 5 lamp	2	73	Exclude existing Compact Fluorescent fixture	2	23	2,607	2,607	0.10	260.7	0.0	none
Facilities - Interior	City Hall	HALL	HALL	Hall / Corridor	Compact Fluorescent - 5 lamp	2	73	Exclude existing Compact Fluorescent fixture	2	23	2,607	2,607	0.10	260.7	0.0	none
Facilities - Interior	City Hall	HALL	HALL	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall	HALL 2	HALL 2	Hall / Corridor	2x4 Rec. Acrylic - T8	1	112	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	1	48	2,607	2,607	0.06	166.9	0.0	none
Facilities - Interior	City Hall	RECORDS	RECORDS	Storage / Closet	2X4 Rec. Acrylic	6	108	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	6	48	2,607	1,825	0.36	938.6	225.3	Ceiling/Corner
Facilities - Interior	City Hall	RECORDS	RECORDS	Storage / Closet	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	RECORDS	RECORDS	Storage / Closet	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall	RECORDS STORAGE	RECORDS STORAGE	Storage / Closet	2X4 Rec. Acrylic	1	138	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	1	48	2,607	1,825	0.09	234.6	37.5	Wall Switch
Facilities - Interior	City Hall	RECORDS STORAGE	RECORDS STORAGE	Storage / Closet	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	IT STORAGE	IT STORAGE	Storage / Closet	1X4 Strip	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.03	78.2	32.9	Wall Switch
Facilities - Interior	City Hall Annex	IT STORAGE	IT STORAGE	Storage / Closet	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	LOBBY	LOBBY	Hall / Corridor	Compact Fluorecent	6	32	Exclude existing Compact Fluorescent fixture	6	32	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	LOBBY	LOBBY	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	STAIRS	STAIRS	Stairs	1X4 Wrap	4	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	4	42	8,760	8,760	0.12	1,051.2	0.0	none
Facilities - Interior	City Hall Annex	WOMENS RR	WOMENS RR	Restrooms	1X4 Strip	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.03	78.2	32.9	Ceiling/Corner
Facilities - Interior	City Hall Annex	WOMENS RR	WOMENS RR	Restrooms	Compact Fluorecent	2	32	Exclude existing Compact Fluorescent fixture	2	32	2,607	1,825	0.00	0.0	50.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	WOMENS RR	WOMENS RR	Restrooms	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	WOMENS RR	WOMENS RR	Restrooms	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BLDG & CODE OPEN	BLDG & CODE OPEN	Open Area	2X4 Rec. Parabolic	27	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	27	64	2,607	1,825	2.16	5,631.4	1,351.5	Ceiling/Corner
Facilities - Interior	City Hall Annex	BLDG & CODE OPEN	BLDG & CODE OPEN	Open Area	Wall Switch	4	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	4	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BLDG & CODE OPEN	BLDG & CODE OPEN	Open Area	Wall Switch	4	0	Install Occupancy Sensor Power Pack	4	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	TERRI TUBBS	TERRI TUBBS	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Wall Switch
Facilities - Interior	City Hall Annex	TERRI TUBBS	TERRI TUBBS	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PAYMENT AREA	PAYMENT AREA	Office / Admin Area	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	2	64	2,607	1,825	0.16	417.1	100.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	PAYMENT AREA	PAYMENT AREA	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PAYMENT AREA	PAYMENT AREA	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	COLLECTION SUPV.	COLLECTION SUPV.	Office / Admin Area	2X4 Rec. Parabolic	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	2,607	0.03	78.2	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	City Hall Annex	COLLECTION SUPV.	COLLECTION SUPV.	Office / Admin Area	2X4 Rec. Parabolic	1	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	1	64	2,607	1,825	0.08	208.6	50.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	COLLECTION SUPV.	COLLECTION SUPV.	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	COLLECTION SUPV.	COLLECTION SUPV.	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BLDG. INSPECTOR	BLDG. INSPECTOR	Office / Admin Area	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	2	64	2,607	1,825	0.16	417.1	100.1	Wall Switch
Facilities - Interior	City Hall Annex	BLDG. INSPECTOR	BLDG. INSPECTOR	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BLDG. DIRECTOR	BLDG. DIRECTOR	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Wall Switch
Facilities - Interior	City Hall Annex	BLDG. DIRECTOR	BLDG. DIRECTOR	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BLDG.DIRECTOR SEC	BLDG.DIRECTOR SEC	Office / Admin Area	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	2	64	2,607	1,825	0.16	417.1	100.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	BLDG.DIRECTOR SEC	BLDG.DIRECTOR SEC	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BLDG.DIRECTOR SEC	BLDG.DIRECTOR SEC	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BLDG. RECORDS	BLDG. RECORDS	Open Area	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	2	64	2,607	2,607	0.16	417.1	0.0	none
Facilities - Interior	City Hall Annex	BLDG. RECORDS	BLDG. RECORDS	Open Area	2X4 Rec. Parabolic	2	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	2,607	0.06	156.4	0.0	none
Facilities - Interior	City Hall Annex	HALL	HALL	Hall / Corridor	Compact Fluorecent	3	32	Exclude existing Compact Fluorescent fixture	3	32	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HALL	HALL	Exit / Emergency	Exit Sign - LED	4	3	Exclude LED Exit Sign	4	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	ELV. ROOM	ELV. ROOM	Elec / Mech	2X4 Rec. Parabolic	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	521	365	0.03	15.6	6.6	DTS
Facilities - Interior	City Hall Annex	ELV. ROOM	ELV. ROOM	Elec / Mech	Wall Switch	1	0	Install Digital Timer	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HUMAN RES. #1	HUMAN RES. #1	Office / Admin Area	2X4 Rec. Parabolic	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	2,607	0.03	78.2	0.0	none
Facilities - Interior	City Hall Annex	HUMAN RES. #1	HUMAN RES. #1	Office / Admin Area	2X4 Rec. Parabolic	1	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	1	64	2,607	2,607	0.08	208.6	0.0	none
Facilities - Interior	City Hall Annex	HUMAN RES. OPEN	HUMAN RES. OPEN	Open Area	2X4 Rec. Parabolic	4	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.12	312.9	131.4	Ceiling/Corner
Facilities - Interior	City Hall Annex	HUMAN RES.OPEN	HUMAN RES.OPEN	Open Area	2X4 Rec. Acrylic	3	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	3	64	2,607	1,825	0.22	578.8	150.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	HUMAN RES.OPEN	HUMAN RES.OPEN	Open Area	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HUMAN RES.OPEN	HUMAN RES.OPEN	Open Area	Wall Switch	4	0	Install Occupancy Sensor Power Pack	4	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HUMAN RES. #2	HUMAN RES. #2	Office / Admin Area	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	2	64	2,607	1,825	0.16	417.1	100.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	HUMAN RES. #2	HUMAN RES. #2	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HUMAN RES. #2	HUMAN RES. #2	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HUMAN RES.SUPV.	HUMAN RES.SUPV.	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	HUMAN RES.SUPV.	HUMAN RES.SUPV.	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HUMAN RES.SUPV.	HUMAN RES.SUPV.	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PROCOREMENT #1	PROCOREMENT #1	Open Area	2X4 Rec. Parabolic	6	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	6	64	2,607	1,825	0.48	1,251.4	300.3	Ceiling/Corner
Facilities - Interior	City Hall Annex	PROCOREMENT #1	PROCOREMENT #1	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PROCOREMENT #1	PROCOREMENT #1	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PRINTER RM	PRINTER RM	Office / Admin Area	2X4 Rec. Parabolic	2	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.06	156.4	65.7	Wall Switch
Facilities - Interior	City Hall Annex	PRINTER RM	PRINTER RM	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PROCOREMENT #2	PROCOREMENT #2	Open Area	2X4 Rec. Parabolic	4	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	2,607	0.12	312.9	0.0	none
Facilities - Interior	City Hall Annex	PROCOREMENT #2	PROCOREMENT #2	Open Area	2X4 Rec. Parabolic	13	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	13	64	2,607	1,825	1.04	2,711.4	650.7	Ceiling/Corner

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	City Hall Annex	PROCOREMENT #2	PROCOREMENT #2	Open Area	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PROCOREMENT #2	PROCOREMENT #2	Open Area	Wall Switch	4	0	Install Occupancy Sensor Power Pack	4	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	Incandescent	8	20	Relamp incandescent fixture with LED MR16	8	7	2,607	2,607	0.10	271.1	0.0	none
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BREAK RM	BREAK RM	Break / Lounge	2X4 Rec. Parabolic	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.03	78.2	32.9	Wall Switch
Facilities - Interior	City Hall Annex	BREAK RM	BREAK RM	Break / Lounge	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PROCOREMENT ASST.	PROCOREMENT ASST.	Office / Admin Area	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	2	64	2,607	1,825	0.16	417.1	100.1	Wall Switch
Facilities - Interior	City Hall Annex	PROCOREMENT ASST.	PROCOREMENT ASST.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PROCOREMENT DIR.	PROCOREMENT DIR.	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Wall Switch
Facilities - Interior	City Hall Annex	PROCOREMENT DIR.	PROCOREMENT DIR.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	FRONT LOBBY	FRONT LOBBY	Hall / Corridor	Compact Fluorecent	3	32	Exclude existing Compact Fluorescent fixture	3	32	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	FRONT LOBBY	FRONT LOBBY	Hall / Corridor	Incandescent	5	20	Relamp incandescent fixture with LED MR16	5	7	2,607	2,607	0.07	169.5	0.0	none
Facilities - Interior	City Hall Annex	FRONT LOBBY	FRONT LOBBY	Exit / Emergency	Exit Sign - Incandescent	1	30	Replace fixture with NEW LED Exit Sign - Battery Back Up	1	3	8,760	8,760	0.03	236.5	0.0	none
Facilities - Interior	City Hall Annex	MENS RR	MENS RR	Restrooms	1X4 Strip	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.03	78.2	32.9	Ceiling/Corner
Facilities - Interior	City Hall Annex	MENS RR	MENS RR	Restrooms	Compact Fluorecent	2	32	Exclude existing Compact Fluorescent fixture	2	32	2,607	1,825	0.00	0.0	50.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	MENS RR	MENS RR	Restrooms	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	MENS RR	MENS RR	Restrooms	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HALL	HALL	Hall / Corridor	Compact Fluorecent	3	32	Exclude existing Compact Fluorescent fixture	3	32	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	HALL	HALL	Exit / Emergency	Exit Sign - LED	2	3	Exclude LED Exit Sign	2	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	STAIRS	STAIRS	Hall / Corridor	1X4 Wrap	2	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	2,607	0.06	156.4	0.0	none
Facilities - Interior	City Hall Annex	WOMENS RR	WOMENS RR	Restrooms	Compact Fluorecent	3	32	Exclude existing Compact Fluorescent fixture	3	32	2,607	1,825	0.00	0.0	75.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	WOMENS RR	WOMENS RR	Restrooms	1X4 Strip	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.03	78.2	32.9	Ceiling/Corner
Facilities - Interior	City Hall Annex	WOMENS RR	WOMENS RR	Restrooms	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	WOMENS RR	WOMENS RR	Restrooms	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	JANITOR	JANITOR	Storage / Closet	1X4 Strip	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	2,607	0.03	78.2	0.0	none
Facilities - Interior	City Hall Annex	ELV. LOBBY	ELV. LOBBY	Hall / Corridor	Compact Fluorecent	4	32	Exclude existing Compact Fluorescent fixture	4	32	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	URBAN DESIGN	URBAN DESIGN	Open Area	2X4 Rec. Parabolic	8	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	8	42	2,607	2,607	0.24	625.7	0.0	none
Facilities - Interior	City Hall Annex	URBAN DESIGN	URBAN DESIGN	Open Area	2X4 Rec. Parabolic	11	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	11	64	2,607	2,607	0.88	2,294.3	0.0	none
Facilities - Interior	City Hall Annex	URBAN DESIGN	URBAN DESIGN	Open Area	2X2 Rec. Parabolic	1	72	Retrofit fixture with (2) 2' 17w lamps, Elec. Ballast and Reflector Kit	1	30	2,607	2,607	0.04	109.5	0.0	none
Facilities - Interior	City Hall Annex	SUPPLY CLOSET	SUPPLY CLOSET	Storage / Closet	2X2 Rec. Parabolic	1	72	Retrofit fixture with (2) 2' 17w lamps, Elec. Ballast and Reflector Kit	1	30	2,607	1,825	0.04	109.5	23.5	Wall Switch
Facilities - Interior	City Hall Annex	SUPPLY CLOSET	SUPPLY CLOSET	Storage / Closet	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	OFFICE #1	OFFICE #1	Office / Admin Area	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	2	64	2,607	1,825	0.16	417.1	100.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	OFFICE #1	OFFICE #1	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	OFFICE #1	OFFICE #1	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	City Hall Annex	MANAGER	MANAGER	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	MANAGER	MANAGER	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	MANAGER	MANAGER	Office / Admin Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	DESIGN SUPV.	DESIGN SUPV.	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	DESIGN SUPV.	DESIGN SUPV.	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	DESIGN SUPV.	DESIGN SUPV.	Office / Admin Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PLANNER OFFICE	PLANNER OFFICE	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	PLANNER OFFICE	PLANNER OFFICE	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PLANNER OFFICE	PLANNER OFFICE	Office / Admin Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PARKS EVENTS	PARKS EVENTS	Office / Admin Area	2X4 Rec. Parabolic	2	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.06	156.4	65.7	Ceiling/Corner
Facilities - Interior	City Hall Annex	PARKS EVENTS	PARKS EVENTS	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PARKS EVENTS	PARKS EVENTS	Office / Admin Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PARKS EVENTS	PARKS EVENTS	Office / Admin Area	Compact Fluorecent	1	32	Exclude existing Compact Fluorescent fixture	1	32	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	PARKS EVENTS	PARKS EVENTS	Office / Admin Area	Incandescent - Recessed Can	5	75	Retrofit existing recessed can fixture with 10w LED Downlight Retrofit Kit 6"	5	10	2,607	2,607	0.33	847.3	0.0	none
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	Incandescent - Recessed Can	7	75	Retrofit existing recessed can fixture with 10w LED Downlight Retrofit Kit 6"	7	10	2,607	2,607	0.46	1,186.3	0.0	none
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	BREAK RM	BREAK RM	Break / Lounge	2X4 Rec. Parabolic	2	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.06	156.4	65.7	Wall Switch
Facilities - Interior	City Hall Annex	BREAK RM	BREAK RM	Break / Lounge	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	MANAGER OPEN	MANAGER OPEN	Open Area	2X4 Rec. Parabolic	6	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	6	64	2,607	2,607	0.48	1,251.4	0.0	none
Facilities - Interior	City Hall Annex	MANAGER OPEN	MANAGER OPEN	Open Area	2X4 Rec. Parabolic	4	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.12	312.9	131.4	Ceiling/Corner
Facilities - Interior	City Hall Annex	MANAGER OPEN	MANAGER OPEN	Open Area	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	MANAGER OPEN	MANAGER OPEN	Open Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	MANAGER OPEN	MANAGER OPEN	Exit / Emergency	Exit Sign - LED	2	3	Exclude LED Exit Sign	2	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	MANAGER OPEN	MANAGER OPEN	Exit / Emergency	Exit Sign - Incandescent	1	30	Replace fixture with NEW LED Exit Sign - Battery Back Up	1	3	8,760	8,760	0.03	236.5	0.0	none
Facilities - Interior	City Hall Annex	IT	IT	Open Area	2X4 Rec. Parabolic	5	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	5	64	2,607	1,825	0.40	1,042.9	250.3	Ceiling/Corner
Facilities - Interior	City Hall Annex	IT	IT	Open Area	2X4 Rec. Parabolic	3	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	3	64	2,607	1,825	0.24	625.7	150.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	IT	IT	Open Area	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	IT	IT	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	SYS ANALYST	SYS ANALYST	Office / Admin Area	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	2	64	2,607	1,825	0.16	417.1	100.1	Ceiling/Corner
Facilities - Interior	City Hall Annex	SYS ANALYST	SYS ANALYST	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	SYS ANALYST	SYS ANALYST	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	IT MANAGER	IT MANAGER	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	IT MANAGER	IT MANAGER	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	City Hall Annex	IT MANAGER	IT MANAGER	Office / Admin Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	SERVER RM	SERVER RM	Elec / Mech	2X4 Rec. Parabolic	3	144	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	3	48	521	365	0.29	150.2	22.5	Ceiling/Corner
Facilities - Interior	City Hall Annex	SERVER RM	SERVER RM	Elec / Mech	2X4 Rec. Parabolic	2	144	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	521	365	0.19	100.1	15.0	Ceiling/Corner
Facilities - Interior	City Hall Annex	SERVER RM	SERVER RM	Elec / Mech	2x2 Rec. Parabolic - T8	1	59	Retrofit fixture with (3) F17T8 lamps, Elec. Ballast and Reflector Kit	1	46	521	365	0.01	6.8	7.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	SERVER RM	SERVER RM	Elec / Mech	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	SERVER RM	SERVER RM	Elec / Mech	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	SERVER ANALYST	SERVER ANALYST	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	SERVER ANALYST	SERVER ANALYST	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	SERVER ANALYST	SERVER ANALYST	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	CITY ATTORNEY	CITY ATTORNEY	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	CITY ATTORNEY	CITY ATTORNEY	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	CITY ATTORNEY	CITY ATTORNEY	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	CITY MANAGER	CITY MANAGER	Office / Admin Area	2X4 Rec. Parabolic	4	144	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit - Power feed must be relocated to	4	64	2,607	1,825	0.32	834.3	200.2	Ceiling/Corner
Facilities - Interior	City Hall Annex	CITY MANAGER	CITY MANAGER	Office / Admin Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	CITY MANAGER	CITY MANAGER	Office / Admin Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	2X4 Rec. Acrylic	3	138	Retrofit fixture with (2) 28w T8 lamps, HP Elec. Ballast and Reflector Kit	3	64	2,607	2,607	0.22	578.8	0.0	none
Facilities - Interior	City Hall Annex	CONF. RM	CONF. RM	Confernece	Incandescent - Recessed Can	8	75	Retrofit existing recessed can fixture with 10w LED Downlight Retrofit Kit 6"	8	10	2,607	2,607	0.52	1,355.7	0.0	none
Facilities - Interior	City Hall Annex	LOBBY	LOBBY	Hall / Corridor	Compact Fluorecent	8	32	Exclude existing Compact Fluorescent fixture	8	32	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	LOBBY	LOBBY	Exit / Emergency	Exit Sign - LED	4	3	Exclude LED Exit Sign	4	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	City Hall Annex	TELE RM	TELE RM	Elec / Mech	2X4 Rec. Parabolic	1	72	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	521	521	0.03	15.6	0.0	none
Facilities - Interior	City Hall Annex	STAIRS	STAIRS	Stairs	1X4 Wrap	6	72	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	6	42	8,760	8,760	0.18	1,576.8	0.0	none
Facilities - Interior	City Hall Annex	PARKING GARAGE	PARKING GARAGE	Parking Garage	1x4 Vapor Tight - T8	18	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	18	42	8,760	8,760	0.31	2,680.6	0.0	none
Facilities - Interior	City Hall Annex	PARKING GARAGE	PARKING GARAGE	Exit / Emergency	Exit Sign - LED	2	3	Exclude LED Exit Sign	2	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Truck Bay	Truck Bay	Truck Bay	1X8 Vapor Tight	7	140	Retrofit 1x8 fixture with (4) T8 lamps, LP Elec. Ballast and Reflector Kit (VT Kit)	7	84	1,043	1,043	0.39	408.8	0.0	none
Facilities - Interior	Fire Station 3	Fitness Rm	Fitness Rm	Truck Bay	2x4 Rec. Acrylic - T8	5	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	5	48	1,043	730	0.20	203.4	75.1	Ceiling/Corner
Facilities - Interior	Fire Station 3	Fitness Rm	Fitness Rm	Fire Station Living Areas	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Fitness Rm	Fitness Rm	Fire Station Living Areas	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Gen. Rm	Gen. Rm	Fire Station Utility Areas	1x8 Vapor Tight - 8' T8	1	118	Retrofit 1x8 fixture with (4) T8 lamps, LP Elec. Ballast and Reflector Kit (VT Kit)	1	84	521	365	0.03	17.7	13.1	DTS
Facilities - Interior	Fire Station 3	Gen. Rm	Gen. Rm	Fire Station Utility Areas	Wall Switch	1	0	Install Digital Timer	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Storage	Storage	Fire Station Storage	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	521	521	0.02	8.9	0.0	none
Facilities - Interior	Fire Station 3	Stairs	Stairs	Stairs	Compact Fluorescent - Rec Can 8	2	52	Exclude existing Compact Fluorescent fixture	2	52	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Stairs	Stairs	Stairs	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	8,760	8,760	0.03	297.8	0.0	none
Facilities - Interior	Fire Station 3	Lounge	Lounge	Fire Station Living Areas	2x4 Rec. Acrylic - T8	8	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	8	42	2,607	1,825	0.14	354.6	262.8	Ceiling/Corner
Facilities - Interior	Fire Station 3	Lounge	Lounge	Fire Station Living Areas	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Lounge	Lounge	Fire Station Living Areas	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Fire Station 3	Dining Area	Dining Area	Fire Station Living Areas	2x4 Rec. Acrylic - T8	6	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	6	42	2,607	1,825	0.10	265.9	197.1	Ceiling/Corner
Facilities - Interior	Fire Station 3	Dining Area	Dining Area	Fire Station Living Areas	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Dining Area	Dining Area	Fire Station Living Areas	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Hall	Hall	Fire Station Living Areas	2x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Fire Station 3	Laundry	Laundry	Fire Station Living Areas	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Fire Station 3	Laundry	Laundry	Fire Station Living Areas	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Women Lockers	Women Lockers	Fire Station Living Areas	2x4 Rec. Acrylic - T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	3	42	2,607	2,607	0.05	133.0	0.0	none
Facilities - Interior	Fire Station 3	Women Lockers	Women Lockers	Fire Station Living Areas	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	2,607	0.02	44.3	0.0	none
Facilities - Interior	Fire Station 3	Women Lockers	Women Lockers	Fire Station Living Areas	Compact Fluorescent - Rec Can 8	2	52	Exclude existing Compact Fluorescent fixture	2	52	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Mens Lockers	Mens Lockers	Fire Station Living Areas	2x4 Rec. Acrylic - T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	3	42	2,607	2,607	0.05	133.0	0.0	none
Facilities - Interior	Fire Station 3	Mens Lockers	Mens Lockers	Fire Station Living Areas	1x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Fire Station 3	Mens Lockers	Mens Lockers	Fire Station Living Areas	Compact Fluorescent - Rec Can 8	2	52	Exclude existing Compact Fluorescent fixture	2	52	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Mens RR	Mens RR	Restrooms	2x4 Rec. Acrylic - T8	1	112	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	1	48	2,607	1,825	0.06	166.9	37.5	Wall Switch
Facilities - Interior	Fire Station 3	Mens RR	Mens RR	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Capt. Office	Capt. Office	Office / Admin Area	2x4 Rec. Acrylic - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Wall Switch
Facilities - Interior	Fire Station 3	Capt. Office	Capt. Office	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Elec. Rm.	Elec. Rm.	Elec / Mech	2x4 Rec. Acrylic - T8	1	112	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	1	48	521	365	0.06	33.4	7.5	DTS
Facilities - Interior	Fire Station 3	Elec. Rm.	Elec. Rm.	Elec / Mech	Wall Switch	1	0	Install Digital Timer	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	Fire Station 3	Bunk Area	Bunk Area	Fire Station Bunk Area	2x4 Rec. Acrylic - T8	6	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	6	42	1,460	1,460	0.10	148.9	0.0	none
Facilities - Interior	Public Safety	1	1	Storage / Closet	2x4 Rec. Acrylic - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	2,607	0.07	177.3	0.0	none
Facilities - Interior	Public Safety	2	2	Storage / Closet	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	2	2	Open Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	3	3	Open Area	2x4 Rec. Parabolic - T8	15	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	15	48	2,607	1,825	0.59	1,525.2	563.1	Ceiling/Corner
Facilities - Interior	Public Safety	3	3	Open Area	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	3	3	Open Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	4	4	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	4	4	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	5	5	Hall / Corridor	2x2 Rec. Acrylic - T8 (F17)	15	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	15	30	2,607	1,825	0.06	156.4	352.0	Ceiling/Corner
Facilities - Interior	Public Safety	5	5	Hall / Corridor	Wall Switch	3	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	3	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	5	5	Hall / Corridor	Wall Switch	3	0	Install Occupancy Sensor Power Pack	3	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	5	5	Hall / Corridor	2x4 Rec. Parabolic T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	2,607	0.02	44.3	0.0	none
Facilities - Interior	Public Safety	5	5	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	6	6	Police Evidence Area	1x4 Rec. Acrylic - T8	7	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	7	42	2,607	2,607	0.12	310.3	0.0	none
Facilities - Interior	Public Safety	6A	6A	Police Evidence Area	1X4 Wrap - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Wall Switch
Facilities - Interior	Public Safety	6A	6A	Police Evidence Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Safety	6B	6B	Police Evidence Area	1X4 Wrap - T8	6	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	6	42	2,607	1,825	0.10	265.9	197.1	Wall Switch
Facilities - Interior	Public Safety	6B	6B	Police Evidence Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	6C	6C	Police Armory	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	1,043	730	0.03	35.5	26.3	Wall Switch
Facilities - Interior	Public Safety	6C	6C	Police Armory	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	1,043	1,043	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	7	7	Restrooms	1X4 Strip - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Public Safety	7	7	Open Area	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	7	7	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	7A	7A	Locker Room	2x4 Rec. Acrylic - T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	2,607	0.07	177.3	0.0	none
Facilities - Interior	Public Safety	7A	7A	Locker Room	Compact Fluorescent - Rec. Can 6	2	40	Exclude existing Compact Fluorescent fixture	2	36	2,607	2,607	0.01	20.9	0.0	none
Facilities - Interior	Public Safety	8	8	Locker Room	1X4 Strip - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	2,607	0.02	44.3	0.0	none
Facilities - Interior	Public Safety	8A	8A	Locker Room	2x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Public Safety	8A	8A	Locker Room	Compact Fluorescent - Rec. Can 6	1	40	Exclude existing Compact Fluorescent fixture	1	36	2,607	2,607	0.00	10.4	0.0	none
Facilities - Interior	Public Safety	9	9	Open Area	2x4 Rec. Parabolic - T8	12	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	12	48	2,607	1,825	0.47	1,220.1	450.5	Ceiling/Corner
Facilities - Interior	Public Safety	9	9	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	9	9	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	10	10	Office / Admin Area	2x4 Rec. Parabolic - T8	1	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	1	48	2,607	1,825	0.04	101.7	37.5	Wall Switch
Facilities - Interior	Public Safety	10	10	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	11	11	Office / Admin Area	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	11	11	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	12	12	Office / Admin Area	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	12	12	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	13	13	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	13	13	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	14	14	Restrooms	2X4 Rec. Acrylic	2	108	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	2	48	2,607	2,607	0.12	312.9	0.0	none
Facilities - Interior	Public Safety	15	15	Restrooms	2X4 Rec. Acrylic	2	108	Retrofit fixture with (2) 28w T8 lamps, Elec. ballast and Reflector Kit	2	48	2,607	2,607	0.12	312.9	0.0	none
Facilities - Interior	Public Safety	16	16	Open Area	2x4 Rec. Acrylic - T8	6	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	6	42	2,607	1,825	0.10	265.9	197.1	Wall Switch
Facilities - Interior	Public Safety	16	16	Open Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	17	17	Open Area	2x4 Rec. Parabolic - T8	3	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	3	48	2,607	1,825	0.12	305.0	112.6	Ceiling/Corner
Facilities - Interior	Public Safety	17	17	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	17	17	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	17	17	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	18	18	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	18	18	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	18A	18A	Storage / Closet	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	18A	18A	Storage / Closet	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Safety	19	19	Storage / Closet	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	DTS
Facilities - Interior	Public Safety	19	19	Storage / Closet	Wall Switch	1	0	Install Digital Timer	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	20	20	Confernece	2x4 Rec. Acrylic - T8	5	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	5	42	2,607	1,825	0.09	221.6	164.3	Ceiling/Corner
Facilities - Interior	Public Safety	20	20	Confernece	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	20	20	Confernece	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	A/C Attic	A/C Attic	Elec / Mech	1x4 Industrial - T8	12	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	12	42	521	521	0.20	106.4	0.0	none
Facilities - Interior	Public Safety	21	21	Storage / Closet	2x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	DTS
Facilities - Interior	Public Safety	21	21	Storage / Closet	Wall Switch	1	0	Install Digital Timer	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	22	22	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	2,607	0.08	203.4	0.0	none
Facilities - Interior	Public Safety	24	24	Break / Lounge	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	DTS
Facilities - Interior	Public Safety	24	24	Break / Lounge	Wall Switch	1	0	Install Digital Timer	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	23	23	Open Area	2x4 Rec. Acrylic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Ceiling/Corner
Facilities - Interior	Public Safety	23	23	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	23	23	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	23A	23A	Open Area	2x4 Rec. Acrylic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Ceiling/Corner
Facilities - Interior	Public Safety	23A	23A	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	23A	23A	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	23B	23B	Open Area	2x2 Rec. Acrylic - T8 (F17)	2	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	2	30	2,607	2,607	0.01	20.9	0.0	none
Facilities - Interior	Public Safety	25	25	Office / Admin Area	2x4 Rec. Acrylic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	25	25	Office / Admin Area	Wall Switch	0	0	Install Wall Switch Occupancy Sensor	0	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	26A	26A	Open Area	2x4 Rec. Parabolic - T8	1	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	1	48	2,607	2,607	0.04	101.7	0.0	none
Facilities - Interior	Public Safety	26A	26A	Open Area	2x2 Rec. Acrylic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	2,607	0.02	41.7	0.0	none
Facilities - Interior	Public Safety	26A	26A	Open Area	Compact Fluorescent - Rec Can 6	7	26	Exclude existing Compact Fluorescent fixture	7	26	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	26	26	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	26	26	Office / Admin Area	Wall Switch	0	0	Install Wall Switch Occupancy Sensor	0	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	27	27	Office / Admin Area	2x4 Rec. Parabolic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Wall Switch
Facilities - Interior	Public Safety	27	27	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	28	28	Office / Admin Area	2x4 Rec. Parabolic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Wall Switch
Facilities - Interior	Public Safety	28	28	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	29	29	Office / Admin Area	2x4 Rec. Parabolic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Wall Switch
Facilities - Interior	Public Safety	29	29	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	30	30	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	30	30	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	31	31	Confernece	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	31	31	Confernece	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Safety	33	33	Police Dispatch - rarely on	2x4 Rec. Parabolic - T8	6	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	6	48	521	521	0.23	122.0	0.0	none
Facilities - Interior	Public Safety	33	33	Police Dispatch - rarely on	Incandescent - Track Dim	9	150	Exclude existing Dimming Incandescent fixture	9	150	521	521	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	34	34	Police Dispatch - rarely on	2x4 Rec. Acrylic - T8	1	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	1	48	521	521	0.04	20.3	0.0	none
Facilities - Interior	Public Safety	33A	33A	Restrooms	2x2 Rec. Parabolic - T8	1	59	Retrofit fixture with (3) F17T8 lamps, Elec. Ballast and Reflector Kit	1	46	2,607	2,607	0.01	33.9	0.0	none
Facilities - Interior	Public Safety	33B	33B	Office / Admin Area	2x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Public Safety	35	35	Elec / Mech	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	521	365	0.08	40.7	15.0	DTS
Facilities - Interior	Public Safety	35	35	Elec / Mech	Wall Switch	1	0	Install Digital Timer	1	0	521	521	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	36	36	Hall / Corridor	2x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	Wall Switch
Facilities - Interior	Public Safety	36	36	Hall / Corridor	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	37	37	Open Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	2,607	0.08	203.4	0.0	none
Facilities - Interior	Public Safety	37	37	Open Area	Compact Fluorescent - Rec Can 6	10	26	Exclude existing Compact Fluorescent fixture	10	26	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	38	38	Storage / Closet	Compact Fluorescent - Rec Can 6	1	26	Exclude existing Compact Fluorescent fixture	1	26	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	39	39	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	39	39	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	39A	39A	Storage / Closet	2x2 Rec. Acrylic - T8 (F17)	1	34	Retrofit fixture with (3) F17T8 lamps, Elec. Ballast and Reflector Kit	1	46	2,607	2,607	-0.01	-31.3	0.0	none
Facilities - Interior	Public Safety	40	40	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	40	40	Open Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	41	41	Office / Admin Area	2x4 Rec. Acrylic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Safety	41	41	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	42	42	Open Area	2x4 Rec. Acrylic - T8	14	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	14	42	2,607	1,825	0.24	620.5	459.9	Ceiling/Corner
Facilities - Interior	Public Safety	42	42	Open Area	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	42	42	Open Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	43	43	Storage / Closet	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	43	43	Storage / Closet	2x2 Rec. Acrylic - T8 (F17)	1	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	1	30	2,607	1,825	0.00	10.4	23.5	Wall Switch
Facilities - Interior	Public Safety	43	43	Storage / Closet	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	44	44	Office / Admin Area	2x2 Rec. Acrylic - T8 (F17)	1	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	1	30	2,607	1,825	0.00	10.4	23.5	Wall Switch
Facilities - Interior	Public Safety	44	44	Office / Admin Area	2x4 Rec. Acrylic - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	44	44	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	45	45	Office / Admin Area	2x4 Rec. Acrylic - T8	4	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	4	48	2,607	1,825	0.16	406.7	150.2	Wall Switch
Facilities - Interior	Public Safety	45	45	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	47	47	Locker Room	2x4 Rec. Acrylic - T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	3	42	2,607	1,825	0.05	133.0	98.6	Wall Switch
Facilities - Interior	Public Safety	47	47	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	48	48	Restrooms	2x4 Rec. Acrylic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	2,607	0.08	203.4	0.0	none
Facilities - Interior	Public Safety	49	49	Storage / Closet	1x4 Wrap - T8	2	112	Retrofit fixture with (2) T8 lamps, Elec. Ballast and Reflector Kit	2	48	2,607	2,607	0.13	333.7	0.0	none
Facilities - Interior	Public Safety	50	50	Storage / Closet	1x4 Wrap - T8	2	112	Retrofit fixture with (2) T8 lamps, Elec. Ballast and Reflector Kit	2	48	2,607	2,607	0.13	333.7	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Safety	51	51	Storage / Closet	1x4 Vapor Tight - T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	3	42	2,607	2,607	0.05	133.0	0.0	none
Facilities - Interior	Public Safety	52	52	Storage / Closet	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	52	52	Storage / Closet	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	53	53	Storage / Closet	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	2,607	1,825	0.02	44.3	32.9	Wall Switch
Facilities - Interior	Public Safety	53	53	Storage / Closet	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	54	54	Storage / Closet	Compact Fluorescent - 3 lamp	1	39	Exclude existing Compact Fluorescent fixture	1	39	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	55	55	Storage / Closet	1X4 Wrap - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	2	42	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Public Safety	ME22	ME22	Storage / Closet	1x4 Industrial - T8	8	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	8	42	2,607	2,607	0.14	354.6	0.0	none
Facilities - Interior	Public Safety	Front Lobby	Front Lobby	Hall / Corridor	Compact Fluorescent - Rec Can 8	23	52	Exclude existing Compact Fluorescent fixture	23	52	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Safety	Truck Bay	Truck Bay	Truck Bay	1x4 Vapor Tight - T8	36	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	36	42	1,043	1,043	0.61	638.2	0.0	none
Facilities - Interior	Public Works 3130	Entry	Entry	Hall / Corridor	2x4 Rec. Parabolic T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	Wall Switch
Facilities - Interior	Public Works 3130	Entry	Entry	Hall / Corridor	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Entry	Entry	Exit / Emergency	Exit Sign - LED	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Reception	Reception	Open Area	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Wall Switch
Facilities - Interior	Public Works 3130	Reception	Reception	Open Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Exec. Dir.	Exec. Dir.	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3130	Exec. Dir.	Exec. Dir.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	DPW Dir.	DPW Dir.	Office / Admin Area	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Wall Switch
Facilities - Interior	Public Works 3130	DPW Dir.	DPW Dir.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	DPW Conf.	DPW Conf.	Confernece	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3130	DPW Conf.	DPW Conf.	Confernece	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Cont. Office	Cont. Office	Office / Admin Area	2x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	Wall Switch
Facilities - Interior	Public Works 3130	Cont. Office	Cont. Office	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Womens RR	Womens RR	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	1,825	1,825	0.02	31.0	0.0	Existing Occ Sensors
Facilities - Interior	Public Works 3130	Mens RR	Mens RR	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	1,825	1,825	0.02	31.0	0.0	Existing Occ Sensors
Facilities - Interior	Public Works 3130	Janitor	Janitor	Storage / Closet	2x2 Rec. Parabolic - T8 (F17)	1	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	1	30	2,607	2,607	0.00	10.4	0.0	none
Facilities - Interior	Public Works 3130	Break Area	Break Area	Break / Lounge	2x4 Rec. Parabolic T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	3	42	2,607	2,607	0.05	133.0	0.0	none
Facilities - Interior	Public Works 3130	Break Area	Break Area	Exit / Emergency	Exit Sign - LED w/battery & lights	1	3	Exclude LED Exit Sign	1	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Hall	Hall	Hall / Corridor	2x2 Rec. Parabolic - T8 (F17)	5	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	5	30	2,607	2,607	0.02	52.1	0.0	none
Facilities - Interior	Public Works 3130	Hall	Hall	Exit / Emergency	Exit Sign - LED w/battery & lights	2	3	Exclude LED Exit Sign	2	3	8,760	8,760	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Mail Rm	Mail Rm	Open Area	2x4 Rec. Parabolic T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	3	42	2,607	1,825	0.05	133.0	98.6	Ceiling/Corner
Facilities - Interior	Public Works 3130	Mail Rm	Mail Rm	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Mail Rm	Mail Rm	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Main Conf.	Main Conf.	Confernece	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	2,607	1,825	0.07	177.3	131.4	Wall Switch
Facilities - Interior	Public Works 3130	Main Conf.	Main Conf.	Confernece	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Works 3130	Women's RR	Women's RR	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	1,825	1,825	0.02	31.0	0.0	Existing Occ Sensors
Facilities - Interior	Public Works 3130	Men's RR	Men's RR	Restrooms	1X4 Wrap - T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	1	42	1,825	1,825	0.02	31.0	0.0	Existing Occ Sensors
Facilities - Interior	Public Works 3130	Printer	Printer	Open Area	2x4 Rec. Parabolic T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	2,607	2,607	0.02	44.3	0.0	none
Facilities - Interior	Public Works 3130	Project Manager	Project Manager	Open Area	2x4 Rec. Parabolic T8	9	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	9	42	2,607	2,607	0.15	398.9	0.0	none
Facilities - Interior	Public Works 3130	Server Rm	Server Rm	Server Room	2x4 Rec. Parabolic T8	4	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	4	42	1,043	730	0.07	70.9	52.6	Wall Switch
Facilities - Interior	Public Works 3130	Server Rm	Server Rm	Server Room	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	1,043	1,043	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Foyer	Foyer	Server Room	2x4 Rec. Parabolic T8	1	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	1	42	1,043	1,043	0.02	17.7	0.0	none
Facilities - Interior	Public Works 3130	Dock Storage	Dock Storage	Storage / Closet	1x8 Strip - T8	1	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	1	84	2,607	2,607	0.03	88.6	0.0	none
Facilities - Interior	Public Works 3130	Road Supv.	Road Supv.	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3130	Road Supv.	Road Supv.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Canal Supv.	Canal Supv.	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3130	Canal Supv.	Canal Supv.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Head Eng.	Head Eng.	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3130	Head Eng.	Head Eng.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Fac/Park Supv	Fac/Park Supv	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3130	Fac/Park Supv	Fac/Park Supv	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	Sanitation Supv.	Sanitation Supv.	Office / Admin Area	2x2 Rec. Parabolic - T8 (F17)	4	34	Relamp & Rebalast fixture with (2) F17T8 lamps and Elec. Ballast	4	30	2,607	1,825	0.02	41.7	93.9	Wall Switch
Facilities - Interior	Public Works 3130	Sanitation Supv.	Sanitation Supv.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	202	202	Warehouse	1x8 Strip - T8	3	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	3	84	2,868	2,008	0.10	292.5	216.8	Ceiling/Corner
Facilities - Interior	Public Works 3130	202	202	Warehouse	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,868	2,868	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	202	202	Warehouse	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,868	2,868	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	202	202	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch
Facilities - Interior	Public Works 3130	202	202	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	203	203	Shop	1x8 Strip - T8	4	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	4	84	2,607	1,825	0.14	354.6	262.8	Ceiling/Corner
Facilities - Interior	Public Works 3130	203	203	Shop	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	203	203	Shop	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	203	203	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Works 3130	203	203	Open Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	203	203	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch
Facilities - Interior	Public Works 3130	203	203	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	204	204	Shop	1x8 Strip - T8	4	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	4	84	2,607	1,825	0.14	354.6	262.8	Ceiling/Corner
Facilities - Interior	Public Works 3130	204	204	Office / Admin Area	2x4 Rec. Acrylic - T8	2	59	Relamp & Reballast fixture with (2) 28w T8 lamps and Low Power Elec. Ballast	2	42	2,607	1,825	0.03	88.6	65.7	Wall Switch
Facilities - Interior	Public Works 3130	204	204	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch
Facilities - Interior	Public Works 3130	204	204	Shop	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	204	204	Shop	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Works 3130	204	204	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	205/212	205/212	Shop	1x8 Strip - T8	10	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	10	84	2,607	1,825	0.34	886.4	657.0	Ceiling/Corner
Facilities - Interior	Public Works 3130	205/212	205/212	Restrooms	Incandescent	2	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	2	30	2,607	1,825	0.26	677.9	46.9	Wall Switch
Facilities - Interior	Public Works 3130	205/212	205/212	Shop	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	205/212	205/212	Shop	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	205/212	205/212	Restrooms	Wall Switch	2	0	Install Wall Switch Occupancy Sensor	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	206	206	Shop	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,607	1,825	0.17	443.2	328.5	Ceiling/Corner
Facilities - Interior	Public Works 3130	206	206	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch
Facilities - Interior	Public Works 3130	206	206	Shop	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	206	206	Shop	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	206	206	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	207	207	Shop	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,607	1,825	0.17	443.2	328.5	Ceiling/Corner
Facilities - Interior	Public Works 3130	207	207	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch
Facilities - Interior	Public Works 3130	207	207	Shop	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	207	207	Shop	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	207	207	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208	208	Open Area	2x4 Rec. Acrylic - T8	8	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	8	48	2,607	1,825	0.31	813.4	300.3	Ceiling/Corner
Facilities - Interior	Public Works 3130	208	208	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208	208	Open Area	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208 Closet	208 Closet	Storage / Closet	Compact Fluorecent	1	16	Exclude existing Compact Fluorescent fixture	1	16	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208 Locker	208 Locker	Locker Room	1X4 Wrap - T8	3	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	3	42	2,607	1,825	0.05	133.0	98.6	DTS
Facilities - Interior	Public Works 3130	208 Locker	208 Locker	Locker Room	Compact Fluorecent	4	16	Exclude existing Compact Fluorescent fixture	4	16	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208 Locker 2	208 Locker 2	Locker Room	1X4 Wrap - T8	6	59	Relamp & Reballast fixture with (2) 28w T8 lamps and LP Elec. Ballast	6	42	2,607	1,825	0.10	265.9	197.1	DTS
Facilities - Interior	Public Works 3130	208 Locker2	208 Locker2	Locker Room	Compact Fluorecent	4	16	Exclude existing Compact Fluorescent fixture	4	16	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	209A	209A	Storage / Closet	1x8 Strip - T8	3	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	3	84	2,607	1,825	0.10	265.9	197.1	Ceiling/Corner
Facilities - Interior	Public Works 3130	209A	209A	Storage / Closet	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	209A	209A	Storage / Closet	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	209	209	Open Area	2x4 Rec. Acrylic - T8	6	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	6	48	2,607	1,825	0.23	610.1	225.3	Ceiling/Corner
Facilities - Interior	Public Works 3130	209	209	Open Area	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	209	209	Open Area	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208 Supv.	208 Supv.	Office / Admin Area	2x4 Rec. Acrylic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Works 3130	208 Supv.	208 Supv.	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208 Warehouse	208 Warehouse	Shop	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,607	1,825	0.17	443.2	328.5	Ceiling/Corner
Facilities - Interior	Public Works 3130	208 Warehouse	208 Warehouse	Shop	1x8 Strip 4' - T8	5	112	Relamp & Reballast fixture with (4) 28w T8 lamps and Low Power Elec. Ballast	5	84	2,607	1,825	0.14	365.0	328.5	Ceiling/Corner
Facilities - Interior	Public Works 3130	208 Warehouse	208 Warehouse	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch

Facility Name	Building Name	Floor	Map ID / Room	Room Description/ Function	Existing Fixture	Exist. Fixt. Qty (QFE)	Exist. Fixture Watts (FWE)	ECM Description	ECM Qty. (QFN)	ECM Watts (FWN)	Existing Annual Hrs (OHE)	Occ. Sensor Annual Hrs (OHN)	kW Savings	kWh Savings	Occ. Sensor kWh Savings	Type of Controls
Facilities - Interior	Public Works 3130	208 Warehouse	208 Warehouse	Shop	Wall Switch	2	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208 Warehouse	208 Warehouse	Shop	Wall Switch	2	0	Install Occupancy Sensor Power Pack	2	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	208 Warehouse	208 Warehouse	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	211	211	Shop	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,607	1,825	0.17	443.2	328.5	Ceiling/Corner
Facilities - Interior	Public Works 3130	211	211	Shop	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	211	211	Shop	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	211	211	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch
Facilities - Interior	Public Works 3130	211	211	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	215	215	Shop	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,607	1,825	0.17	443.2	328.5	Ceiling/Corner
Facilities - Interior	Public Works 3130	215	215	Shop	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	215	215	Shop	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	215	215	Office / Admin Area	2x4 Rec. Parabolic - T8	2	87	Retrofit fixture with (2) 28w T8 lamps, Elec. Ballast and Reflector Kit - Power feed must be relocated to center	2	48	2,607	1,825	0.08	203.4	75.1	Wall Switch
Facilities - Interior	Public Works 3130	215	215	Office / Admin Area	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	214	214	Shop	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,607	1,825	0.17	443.2	328.5	Ceiling/Corner
Facilities - Interior	Public Works 3130	214	214	Shop	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	214	214	Shop	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	214	214	Restrooms	Incandescent	1	160	Relamp Incandescent fixture with (2) 13w Compact Fluorescent Spiral	1	30	2,607	1,825	0.13	338.9	23.5	Wall Switch
Facilities - Interior	Public Works 3130	214	214	Restrooms	Wall Switch	1	0	Install Wall Switch Occupancy Sensor	1	0	2,607	2,607	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	213	213	Warehouse	1x8 Strip - T8	5	118	Retrofit 1x8 fixture with (4) 28w T8 lamps, LP Elec. Ballast and Reflector Kit	5	84	2,868	2,008	0.17	487.5	361.4	Ceiling/Corner
Facilities - Interior	Public Works 3130	213	213	Warehouse	Wall Switch	1	0	Install Ceiling/Corner Occupancy Sensor - Dual Tech	1	0	2,868	2,868	0.00	0.0	0.0	none
Facilities - Interior	Public Works 3130	213	213	Warehouse	Wall Switch	1	0	Install Occupancy Sensor Power Pack	1	0	2,868	2,868	0.00	0.0	0.0	none
TOTALS						**1,602**	**29,098**		**1,602**	**16,429**			**42.27**	**109,213**	**28,384**	

sensorswitch®

CM PDT 10

EXTENDED RANGE 360º SENSOR
CEILING MOUNT • LOW VOLTAGE • DUAL TECHNOLOGY (PDT)

SPECIFICATIONS

FEATURES
100% Digital PIR Detection,
Excellent RF Immunity
360º Coverage Pattern
Patented Dual Technology with
PIR / Microphonics Detection
Push-Button Programmable
Adjustable Time Delays
Convenient Test Mode
No Field Calibration or Sensitivity
Adjustments Required
100 hr Lamp Burn-in Timer
Green LED Indicator

LAMPMAXIMIZER® TECHNOLOGY
- Protects Lamp Life while Maximizing Energy Savings
- Minimum On Timer (15 min default)
- Occ. Time Delay (10 min defatult)
- LampMaximizer+ Mode - Optimizes Lamp Life & Energy Savings (disabled by default)
- Switch Counter (in 1000's)
- Total Lamp On Time (in khrs)

PHYSICAL SPECS
SIZE 4.55" Dia. (11.56 cm)
1.55" Deep (3.94 cm)
WEIGHT 6 oz
MOUNTING
Ceiling Tile Surface
3.5" Octagon Box
Single Gang Handy Box
COLOR White

ELECTRICAL SPECS
OPERATING VOLTAGE
12-24 VAC/VDC
CURRENT DRAW
Standard, 4 mA
w/ R option, 16 mA
DIMMING LOAD Sinks < 20mA;
~40 Ballasts @ .5mA each
RECOMMENDED POWER PACK
PP20

ENVIRONMENTAL SPECS
OPERATING TEMP
14º to 160º F (-10º to 71º C)
STORAGE TEMP
-14º to 160º F (-26º to 71º C)
RELATIVE HUMIDITY
20 to 90% non-condensing
SILICONE FREE
ROHS COMPLIANT

OVERVIEW
Classrooms are ideal applications for the **CM PDT 10** Series Extended Range 360º occupancy sensor. When mounted at 9 ft (2.74 m), this sensor provides line of sight Passive Infrared (PIR) detection of walking type motions up to 28 ft (8.53 m) in all directions. Additionally, the **CM PDT 10** provides overlapping Microphonics™ technology to detect smaller motions and occupant movements that occur behind obstructions. This is important for classrooms filled with obstructions like shelving or hanging projects. When comparing small motion detection, the **CM PDT 10** far out performs dual technology sensors that are specified with 2,000 ft² of coverage. Spaces with low ceiling heights are also best covered by the **CM PDT 10**. For example, when mounted at the 7 ft (2.13 m) ceiling height of many distribution center pick aisles, the **CM PDT 10** provides a 32 ft (9.75 m) diameter pattern of coverage. Additionally, the **CM PDT 10** may be used in combination with other sensors to customize coverage for very large or irregularly shaped spaces.

SENSOR OPERATION
Sensors with Passive Dual Technology (PDT) first see motion using 100% digital Passive Infrared (PIR) detection and then engage Microphonics™ to hear sounds that indicate continued occupancy. This patented technology uses Automatic Gain Control (AGC) to dynamically self adapt a sensor to its environment by filtering out constant background noise and registering only noises typical of human activity. When occupancy is detected, a DC output goes high and can drive up to 200 mA of connected load. If needed, a 10 second grace period also allows the lights to be voice reactivated after shutting off. The sensor is powered with 12-24 VAC/VDC and typically operates with a **PP20** or **MP20** power pack, enabling complete 20 Amp circuits to be controlled.

LAMPMAXIMIZER®
This sensor also contains patent pending LampMaximizer technology that allows users to aggressively target energy savings while still protecting lamp life. A minimum on timer, factory set at 15 minutes, helps preserve lamp life by eliminating all lamp cycles shorter than lamp warranties specify. A standard occupancy time delay is also present that ensures lights turn off (assuming minimum on timer has elapsed) if no occupancy is detected. This timer is factory set at 10 minutes to promote energy savings, but is adjustable between 30 seconds and 20 minutes. These adjustments can be done manually, through the units push-button, or automatically every two weeks through an advanced mode, called LampMaximizer+, that determines the optimum time delay in order to maximize both lamp life and energy savings. Additionally, this sensor maintains statistics on total lamp on time and number of cycles.

OPTIONS

LOW VOLTAGE RELAY (R)
- Enables sensors to interface with other systems (e.g., BMS, lighting panels)
- Provides dry contact closure via a SPDT, 1 Amp, 40 Volt relay
- Only one relay needed per zone
- Changes state when all connected sensors register unoccupied
- Relay requires sensor power to function

OCCUPANCY CONTROLLED DIMMING (D)
- Provides dimming output to control 0-10 VDC dimmable ballasts
- Provides a second occupancy time-out period that enables the lights to go to a dim setting before turning off
- Adjustable max/min dim setting
- Only one sensor per zone needs to have dimming output

PHOTOCELL (P)
- Auto set-point calibration
- Two selectable modes of operation
- On/Off mode: Photocell has full control during periods of occupancy
- Inhibit mode: Photocell can prevent lights from turning on if adequate daylight is available, but cannot turn lights off

PHOTOCELL W/ DIMMING (ADC)
- Photocell within sensor maintains total room light level by controlling levels of 0-10 VDC dimmable ballasts
- Photocell also has full on/off control during periods of occupancy
- Provides a second occupancy time-out period that enables the lights to go to a dim setting before turning off

Note: LampMaximizer+ features not available with ADC option

LOW TEMP/HIGH HUMIDITY (LT)
- Sensor is corrosion resistant to moisture
- Operates down to -4º F (-20º C)

c UL US LISTED

TITLE 24
MADE in U.S.A.
5 YEAR WARRANTY

ORDERING INFO

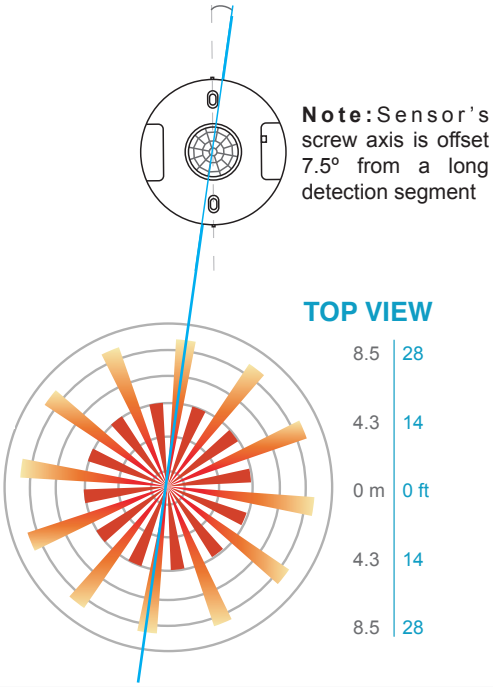
CM PDT 10 [RELAY] [DIMMING/PHOTOCELL] [TEMP/HUMIDITY]

RELAY	DIMMING / PHOTOCELL *CHOOSE ONE ONLY*	TEMP/HUMIDITY
Blank = None	Blank = None	Blank = Standard
R = Low Voltage Relay	D = Occupancy Controlled Dimming	LT = Low Temp
	P = Photocell	
	ADC = Photocell w/ Dimming	

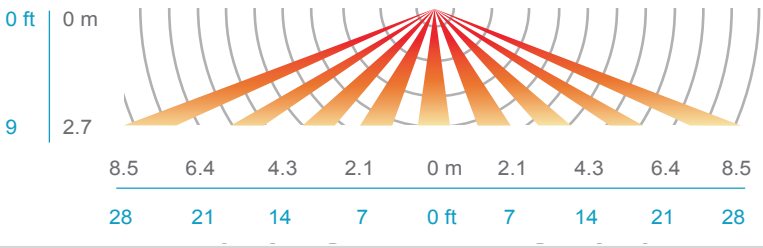
COVERAGE PATTERN

10 EXTENDED RANGE 360° LENS WITH MICROPHONICS™

- Best choice for large motion (e.g. walking) detection
- Viewing angle of 67° in a 360° conical shaped pattern
- Provides 28 ft (8.53 m) radial coverage when mounted to standard 9 ft (2.74 m) ceiling
- 7 to 15 ft (2.13 to 4.57 m) mounting heights provide 16 to 36 ft (4.88 to 10.97 m) radial coverage
- Microphonics™ provides overlapping detection of human activity over the complete PIR coverage area. Advanced filtering is also utilized to prevent non-occupant noises from keeping the lights on.



SIDE VIEW



WIRING (DO NOT WIRE HOT)

STANDARD WIRING

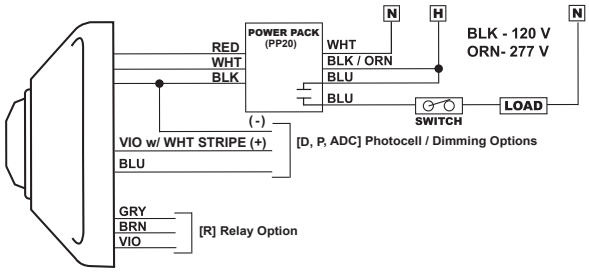
RED - Power Input (12-24 VAC/VDC)
BLACK - Common
WHITE - Occupancy State (high VDC for occupied)

PHOTOCELL/DIMMING OPTIONS (D, P, ADC)

BLUE - Direct output to power pack for providing photocell control and/or secondary dim time out. Output is high VDC with occupancy & low light. Output also held high during secondary dim time out. For multi-level control, use two power packs and connect White wire to primary load and Blue to daylight load.

VIOLET w/ WHITE STRIPE - Connect to 0-10 VDC control wire (typically Violet) from 0-10 VDC dimmable ballast

GRAY from Ballast - Connect to sensor Black wire

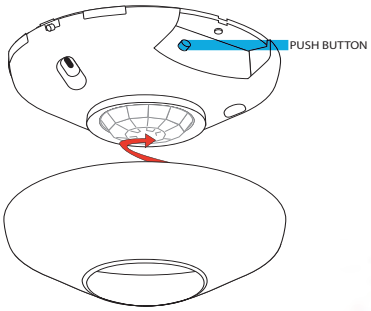


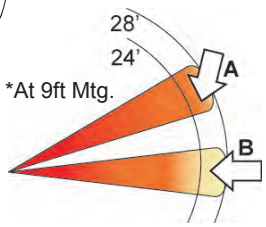
RELAY OPTION (R)

GRAY / BROWN - Connected during occupied state
VIOLET / BROWN - Connected during unoccupied state
Note: Relay is energized during unoccupied state

INSTALLATION

- Mount sensor directly to a ceiling tile or a metallic grid (two self-tapping screws provided).
- Sensor's mounting holes also align with 3.5" octagon or single gang handy box (screws not provided).
- Sensor will detect motions crossing segments more effectively than motions parallel to beams.
- For optimal detection, position sensor such that segments are crossed upon entrance and unable to view outside the space.
- For maximum Microphonics™ sensitivity, avoid locating sensor near HVAC air diffusers.





A: When walking across beam, detection will occur at approximately 28 ft (8.53 m)
B: When walking into beam, detection will occur at approximately 24 ft (7. 32 m)

PROGRAMMING

Refer to instruction card IC7.001 for default settings and directions on programming the sensor via the push-button.

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120/277 VOLT MINI POWER PACKS AND SLAVE PACKS

TECHNICAL DATA

TYPICAL APPLICATIONS

- Used with Low Voltage Sensors
- Multiple Sensors
- Multiple Loads

POWER PACK HIGHLIGHTS

- Dual Voltage Transformer
- Self-Contained Relay
- Powers up to 14 sensors

SPECIFICATIONS

- Size:(1/2" inch chase nipple not inc.) MP-20 & MSP-20: $2^{1}/_{4}$" x 3" x $1^{7}/_{8}$"
- Mounting: 1/2" inch chase nipple
- Operating Voltage: 120, 240, or 277 VAC
- Each Relay: 20 Amps
- 1 HP Motor Load
- Output Voltage: 15 VDC, 150 mA
- Class II: 18 AWG, up to 2,000 ft.
- Plenum Rated
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14º to 160º F
- Storage Temp: -14º to 160º F
- UL and CUL Listed
- 5 Year Warranty
- Made in U.S.A.

LOW TEMP/HI HUMIDITY(-LT)

- Conformally Coated PCB
- Operates down to -40º F
- Corrosion resistant from moisture

PLENUM CONSIDERATIONS

Most local codes allow for small plastic controls in Return Air Plenums; *Some Do Not!* To meet local code, the Power Pack can be mounted inside an adjacent (Deep) junction box as shown below.

MP-20
MSP-20

Plenum Rated

Mini Power Packs are the heart of the Low Voltage Sensor System. The *MP-20* transforms 120, 240 or 277 Volts to class II 15 VDC to power the remote sensors. Although Plenum Rated, the elongated mounting nipple allows for the *MP-20* to be mounted either directly thru a 1/2" inch knockout in a junction box, or to be located inside an adjacent box for specific local code requirements. Up to 14 sensors may be connected to one *MP-20*. Multi-circuit control can be handled by multiple *MP-20's* and Slave Packs (*MSP-20*) may be configured. *MP-20's* can be wired continuously hot (line side), or on the switch leg (load side) without nuisance delays upon turn "On".

MINI POWER PACK OPERATION

The Mini Power Pack consists of a transformer and a relay. The tranformer has a dual primary high voltage input, accepting 120, 240, or 277 VAC. The secondary voltage provides power to Sensor Switch low voltage heads. When the sensor head detects motion, they electronically signal the power pack to close the relay(s) connected to the lighting system.

LOW VOLTAGE OPERATION AND TEST

The Low Voltage Wires are color coded Red (15 VDC), Black (Common), and White (Occupancy Signal). With no sensors connected, touch the Red wire to the White. The lights should turn "On". Remove the connection and the lights should turn "Off". With the sensors connected, the Red and Black wires provide DC power to the remote sensors, and when there is occupancy detected, the White wire produces a 15 VDC signal from the sensor to the power pack initiating the lights to "On". Upon initial power up, the Sensors automatically send an "On" signal until the sensors have stabilized and "Timed Out".

SIZING OF THE SYSTEM - VARIOUS COMBINATIONS

Combining Power Packs provides for additional power to drive remote devices. Maximum numbers of remote sensors are shown below based on the Power Pack/ Slave Pack being used: *Maximum number of "Relays" is 30.*

	Sensors	Sensors with Relay
1 MP-20	14	8
1 MP-20 w/MSP-20	7	6
2 MP-20	28	16

Note 1: Only three relays may be controlled with one Mini Power Pack. If more than three circuits are required, multiple MiniPower Packs must be used.

Note 2: Only one "Sensor with Relay" is required in most cases. See Technical Data on Low Voltage Sensors and SPDT EMS Interface Option.

SYSTEMS CONSIDERATIONS

The local override switch may be upstream or downstream of an *MP-20*. However, if an *MSP-20* Auxiliary Relay controller is being used, the switch(es) should be downstream on the load side of the relay. If power is disconnected to the Power Pack all subsequent relays will open, turning off all of the loads. If wiring the local switches before the Power Pack and Slave Pack, use multiple *MP-20's*, one for each circuit. This will allow for one circuit to remain powered, keeping the system operational when the other is turned off. When controlling a dimming circuit, *MP-20* must be wired before dimmer, or *MSP-20* may be wired after dimmer.

CATALOG INFORMATION

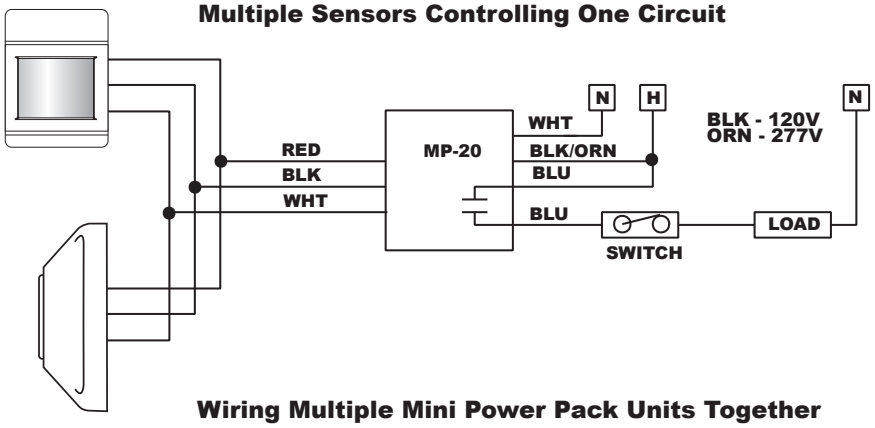
MODEL#	DESCRIPTION	OUTPUT VOLTAGE	OUTPUT CURRENT
MP-20	Power Pack with 20 Amp Relays	15 to 24 VDC	70 to 110 mA
MSP-20	Slave Pack with 20 Amp Relays	N/A	40 mA(consumption)

**Add suffix -LT for Low Temp/Hi Humidity

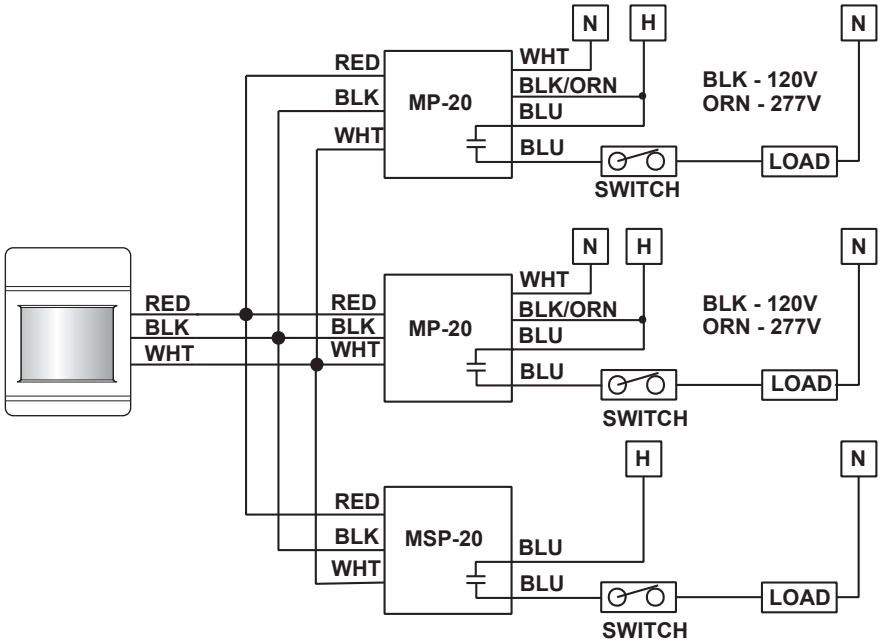
TYPICAL WIRING DIAGRAMS - DO NOT WIRE HOT

NOTE: The Power Pack must be connected to a single phase Hot and Neutral System. For 120 VAC, connect the Black wire to Hot, White wire to Neutral, and Cap off the Orange wire. For 240-277 VAC, connect the Orange to Hot, White to Neutral, and Cap off the Black wire. *Never connect both the Black and Orange wires!* Low Voltage wire can be 18 to 22 AWG; shielding is not necessary.

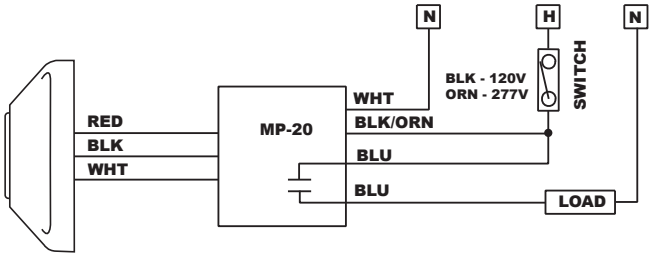
Multiple Sensors Controlling One Circuit



Wiring Multiple Mini Power Pack Units Together



One Sensor Controlling One Circuit



WARRANTY: Sensor Switch, Inc. warrants these products to be free of defects in manufacture and workmanship for a period of sixty months. Sensor Switch, Inc., upon prompt notice of such defect will, at its option, provide a Returned Material Authorization number and a replacement product.

LIMITATIONS AND EXCLUSIONS: This Warranty is in full lieu of all other representation and expressed and implied warranties (including the implied warranties of merchantability and fitness for use) and under no circumstances shall Sensor Switch, Inc. be liable for any incidental or consequential property damages or losses.

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revised 7/8/2005

PTS 60
PTS 720

PROGRAMMABLE (INTERVAL) TIMER SWITCH
LINE VOLTAGE • DECORATOR STYLE

SPECIFICATIONS

APPLICATIONS
- Fluorescent/Incandescent/LED Lighting in Meeting rooms, Library Aisles, Stock Rooms, & Mechanical Rooms
- Exhaust Fans

FEATURES
- Self-Contained Relay
- Interchangeable Hot & Load Wires - Impossible to Wire Backwards
- No Neutral Connection Required
- Self-Grounding Mounting Strap
- No Minimum Load Requirement
- Push-Button Programmable w/o Removing Switch Plate
- Fixed or Adjustable Preset Times
- Optional Audible Timeout Warning at 45, 30, and 15 sec
- Optional Flicker Timeout Warning at 2 and 1 min
- Continous LED Flash for Last 30 sec of Button's Time Setting
- Green On/Off Switch Status LED
- Green LED Time Indicators

PHYSICAL SPECS
- SIZE 4.2"H x 1.8"W x 1.5"D (10.67cm x 4.57cm x 3.81cm)
- WEIGHT 5 oz
- MOUNTING Single Gang Switch Box
- COLORS White, Ivory, Gray, Lt Almond

ELECTRICAL SPECS
- MAXIMUM LOAD
  - 800 W @ 120 VAC
  - 1200 W @ 277 VAC
  - 1500 W @ 347 VAC
- MINIMUM LOAD None
- MOTOR LOAD 1/4 HP
- FREQUENCY 50/60 Hz

ENVIRONMENTAL SPECS
- OPERATING TEMP
  - 14° to 160° F (-10° to 71° C)
- STORAGE TEMP
  - -14° to 160° F (-26° to 71° C)
- RELATIVE HUMIDITY
  - 20 to 90% non-condensing
- ROHS COMPLIANT
- SILICONE FREE

OTHER
- ETL Listed
- ASHRAE 90.1 Compliant (PTS 60)
- IECC Compliant (PTS 60)
- Title 24 Compliant (PTS 60)
- 5 Year Warranty
- Assembled in the U.S.A.

The **PTS 60** and **PTS 720 Series** Electronic Auto Shut-off Timer Switches provide a simple to use and simple to apply lighting control alternative to wall switch occupancy sensors. These elegant decorator style wall stations each provide six preset countdown timer selections as well as an on/off push-button. The **PTS 60** and **PTS 720** units are powered from 120/277 VAC (optional 347 VAC) and are intended to switch a line voltage lighting load or small motor load (see specifications). Additionally, the **PTS 60** and **PTS 720** can be applied without requiring a neutral wiring connection, making them ideal for retrofit applications.

TIMER OPERATION

When the unit's on/off button is pressed, the self-contained relay closes, turning the connected load on. The LED on the button of the last time selected will also turn on, indicating the time remaining before the unit turns the lights off. Optionally, this default timer setting can be fixed. If a different timer selection is required, the user simply presses the button labeled with the time of their choice. If desired, a maximum timer setting can also be programmed into the switch. Once time has elapsed below the point of the next lowest time option, the LED on that button will light and the original time selection's LED will turn off.

At the two and one minute remaining point, the unit will issue a flicker warning to occupants indicating that the lights will shut off if another time selection is not chosen. Additionally, an audible beep warning is issued at 45, 30 and 15 seconds. Both warning indicators can be disabled if desired. Finally, a button's LED will flash continuously during the last 30 seconds of its time setting.

OPTIONS

TIME SCALE [60 / 720]
- 60, 30, 15, 10, 5, 2 min
- 12 hr, 8 hr, 4 hr, 2 hr, 60 min, 30 min

347 VAC (347)
- Allows sensor to be powered from and switch 347 VAC
- Wall plate provided (White/Ivory only)

COLOR
- White, Ivory, Gray, Lt. Almond
- Wall plate provided
- Must be specified

LOW TEMP/HIGH HUMIDITY (LT)
- Sensor is corrosion resistant
- Operates down to -40° F/C

ORDERING INFO

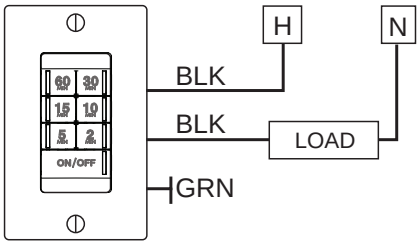
PTS [TIME SCALE] [VOLTAGE] [COLOR] [TEMP/HUMIDITY]

TIME SCALE	VOLTAGE	COLOR	TEMP/HUMIDITY
60 = 60 min max	**Blank = 120/277 VAC**	**WH = White**	**Blank = Standard**
720 = 12 hr max	**347 = 347 VAC**	**IV = Ivory**	**LT = Low Temp**
		GY = Gray	
		AL = Lt. Almond	

WIRING (DO NOT WIRE HOT)

STANDARD WIRING
BLACK* - Line Input
BLACK* - Load Output } *BLACK wires can be reversed
GREEN SCREW - Ground (required connection)

347 VAC OPTION (347)
Black wires are replaced w/ Red wires



Note: Connection to Ground required for sensor to function

PROGRAMMING INSTRUCTIONS **(PLEASE READ ALL 7 STEPS BEFORE PROGRAMMING)**

1. Enter programming mode by pressing & holding upper left button until LED flashes rapidly. Release button.
2. Enter a specific programming function by pressing button the number of times as the desired function number from the tables on the following pages (e.g., for a PTS 60, press five times for function 5, *Max Time Allowable*).
3. The selected function's current setting will then be read out in a sequence of LED flashes (e.g., one flash for 60 min). To change setting, proceed to step 4 before sequence repeats 10 times.
4. While the switch is flashing back current setting, interrupt it by pressing button the number of times for the new desired setting as indicated in the particular function's detailed table (e.g., press twice for 30 min). Switch will begin to flash new setting as confirmation.
5. Next, while the switch is flashing back new setting, interrupt it by pressing and holding button until LED flashes rapidly. Release button.
6. As final confirmation and activation of the new setting, re-enter the programming function number that was changed (e.g., press five times for function 5, *Max Time Allowable*).
7. LED will flash twice indicating acceptance of new setting. If two flashes are not seen, repeat 7 step process.

Note: To exit programming mode without saving or to change to a different function, wait for blink back sequence to repeat 10 times then return to step 1.

Function Number	Function Name	Settings (*indicates default setting)		
2	Blink Warning	1. Enabled 2 min & 1 min*	3. Enabled 1 min	
		2. Disabled	4. Enabled 2 min	
3	Beep Warning	1. Enabled*	2. Disabled	
4	Status Tick	1. Enabled (ticks every 1 sec)	2. Disabled*	3. Enabled, (ticks every 0.5 sec)
5	Max Time Allowable (model # PTS 60)	1. 60 min*	3. 15 min	5. 5 min
		2. 30 min	4. 10 min	6. 2 min
5	Max Time Allowable (model # PTS 720)	1. 12 hr*	3. 4 hr	5. 60 min
		2. 8 hr	4. 2 hr	6. 30 min
6	Default Time - when on/off button pressed (model # PTS 60)	1. 60 min	4. 10 min	7. Last time selected*
		2. 30 min	5. 5 min	
		3. 15 min	6. 2 min	
6	Default Time - when on/off button pressed (model # PTS 720)	1. 12 hr	4. 2 hr	7. Last time selected*
		2. 8 hr	5. 60 min	
		3. 4 hr	6. 30 min	
9	Factory Defaults	1. Maintain current*	2. Restore defaults	

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WSD

WALL SWITCH DECORATOR SENSOR
LINE VOLTAGE • PASSIVE INFRARED (PIR)

SPECIFICATIONS

FEATURES
- PIR Occupancy Detection
- Self-Contained Relay - No Power Pack Needed
- Interchangeable Hot & Load Wires - Impossible to Wire Backwards
- No Neutral Required / No Minimum Load
- Small Motion Detection to 20 ft (6.10 m)
- Self-Grounding Mounting Strap
- Compatible w/ Electronic & Magnetic Ballasts, CFLs, & Incandescents
- Push-Button Programmable w/o Removing the Switch Plate
- Adjustable Time Delay
- LampMaximizer® Minimum On Time (disabled by default)
- Non-Volatile Settings Memory
- Green LED Indicator

PHYSICAL SPECS
SIZE (not including mounting strap)
2.74"H x 1.68"W x 1.63"D
(6.96cm x 4.27cm x 4.14cm)
WEIGHT 5 oz
MOUNTING Single Gang Switch Box
MOUNTING HEIGHT 30-48 in
(76.2-121.9 cm)
COLORS White, Ivory, Gray
Lt. Almond, Black

ELECTRICAL SPECS
MAXIMUM LOAD
800 W @ 120 VAC
1200 W @ 277 VAC
1500 W @ 347 VAC
MINIMUM LOAD None
MOTOR LOAD 1/4 HP
FREQUENCY 50/60 Hz
(timers are 1.2x for 50 Hz)

ENVIRONMENTAL SPECS
OPERATING TEMP
14º to 160º F (-10º to 71º C)
RELATIVE HUMIDITY
20 to 90% non-condensing
SILICONE FREE
ROHS COMPLIANT

OVERVIEW
The **WSD** is a stylish, easy to install, and simple to use Wall Switch Decorator style Passive Infrared (PIR) sensor. It is ideal for private offices, copy rooms, closets, or any small enclosed space without obstructions. A user programmable time delay ensures that once the room is vacated the sensor will time out and turn off the lights. Additionally, the **WSD** sensor has several On Modes and Switch Modes that can be programmed using the front push-button. For rooms with obstructions, the Dual Technology **WSD PDT** Series sensor is recommended.

SENSOR OPERATION
The sensor detects changes in the infrared energy given off by occupants as they move within the field-of-view. When occupancy is detected, the relay switches the connected load on as dictated by the sensor's operational settings.

An internal timer keeps the lights on during brief periods of inactivity and turns the lights off when it expires. The default time delay is 10 minutes. This timer is programmable from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected. Patent pending LampMaximzer technology is also present in this sensor, providing an additional minimum on time (disabled by default) to be used if desired. This state-of-the-art design requires no field calibration or sensitivity adjustments.

ON MODES
AUTOMATIC ON **(default)** - Lights come on when occupancy is detected.
MANUAL ON - Requires the occupant manually turn on lights via the push-button.
REDUCED TURN ON - Sensor is initially set to only detect large motions, effectively ignoring PIR signals reflected off of surfaces, while still sensing occupants when they enter the room. Once lights are on, the sensor returns to maximum sensitivity.

SWITCH MODES
PREDICTIVE OFF MODE **(default)** - This mode allows occupants to turn lights off via the switch without losing the convenience of having the lights automatically turn on when they re-enter the room. Pressing the switch turns the lights off and temporarily disables the occupancy detection in the sensor. After a short exit time delay, the occupancy detection reactivates and monitors for an additional grace period. If no occupancy is detected, the zone will remain in Automatic On operation. If occupancy is detected, the zone will go to a Permanent Off mode, requiring the switch to be pressed again in order to turn the lights on and restore the sensor to Automatic On operation.
PERMANENT OFF - Pressing the switch turns the lights and the sensor off. Lights will not come on until switch is pressed again.
SWITCH DISABLE - Prevents user from manually turning off the lights via the push-button. Button can still be utilized for programming.

OPTIONS

VANDAL-RESISTANT LENS (V)
- Ideal for high abuse or public areas
- Decreases detection range by 50%

INHIBIT PHOTOCELL (P)
- Auto set-point calibration
- Photocell prevents lights from turning on if adequate daylight is available, but does not turn lights off

347 VAC (347)
- Allows sensor to be powered from and switch 347 VAC
- Wall plate provided (Ivory & White only)

COLOR
- White, Ivory, Gray, Lt. Almond, Black
- Wall plate provided
- Must be specified when ordered

LOW TEMP/HIGH HUMIDITY (LT)
- Sensor electronics are coated for corrosion resistance
- Operates down to -40º F/C
- Required for bathroom & cooler/freezer applications

c UL us LISTED

TITLE 24
ASSEMBLED in U.S.A.
5 YEAR WARRANTY

ORDERING INFO

WSD [LENS] [PHOTOCELL] [VOLTAGE] [COLOR] [TEMP/HUMIDITY]

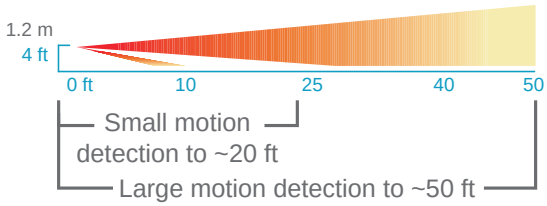
LENS	PHOTOCELL	VOLTAGE	COLOR	TEMP/HUMIDITY
Blank = Standard	**Blank = None**	**Blank = 120/277 VAC**	**WH = White**	**Blank = Standard**
V = Vandal Resistant	**P = Photocell**	**347 = 347 VAC**	**IV = Ivory**	**LT = Low Temp**
			GY = Gray	
			AL = Lt. Almond	
			BK = Black	

COVERAGE PATTERN

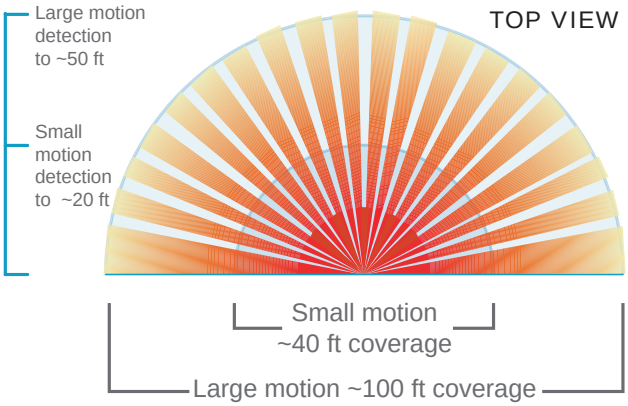
WALL SWITCH DECORATOR LENS

- Small motion (e.g. hand movements) detection up to 20 ft (6.10 m)
- Large motion (e.g. walking) detection up to 50 ft (15.24 m), ~3925 ft^2
- 180º wall-to-wall coverage

SIDE VIEW



TOP VIEW



WIRING (DO NOT WIRE HOT)

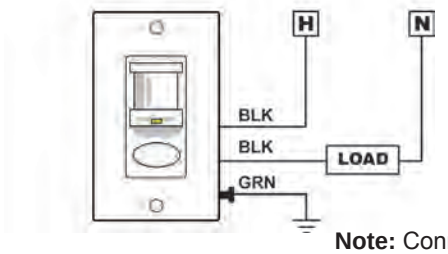
STANDARD WIRING

BLACK* - Line Input
BLACK* - Load Output
} *BLACK wires can be reversed
GREEN SCREW - Ground (required connection)

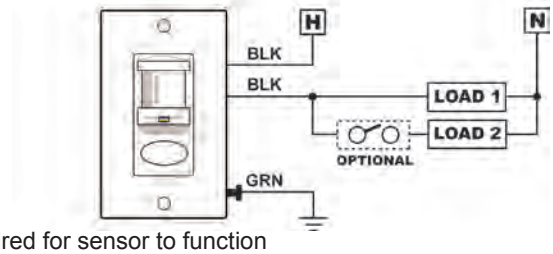
347 VAC OPTION (347)

Black wires are replaced w/ Red wires

STANDARD CONFIGURATION



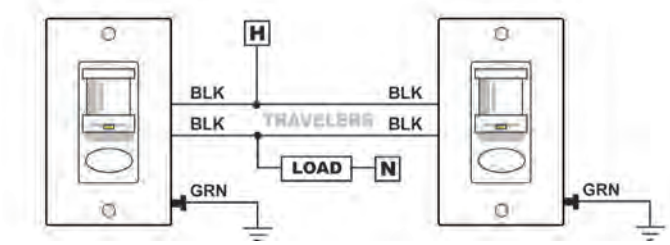
BI-LEVEL CONFIGURATION

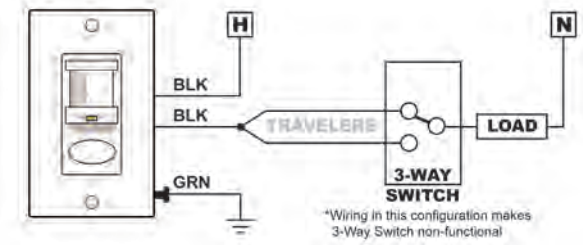


Note: Connection to Ground required for sensor to function

3-WAY CONFIGURATIONS

Travelers are used to wire sensors (or sensor and 3-way switch) in parallel.





Note: Connection to Ground required for sensor to function

PROGRAMMING

Refer to included instruction card IC2.002 for default settings and directions on programming the sensor via the push-button.

WARNING

Fire Hazard Caution: Maximum Lamps 1500 Watts, Type 347 VAC.
Attention: Risque d'incendie : Pauissance Maximales Des Lampes 1500 Watts, Type 347 VAC.
Warning: The units are intended to be installed by a qualified person with properly rated branch circuit protectors as per applicable local and national regulations (CEC, NEC).

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WV PDT 16

WIDE VIEW SENSOR
CORNER MOUNT • LOW VOLTAGE • DUAL TECHNOLOGY (PDT)

SPECIFICATIONS

FEATURES
- PIR Occupancy Detection
- 120° by 40 ft (12.19 m) Coverage for Small Motion
- Adjustable Time Delay
- 100 Hr. Lamp Burn-In Timer Mode
- Green LED Indicator

PHYSICAL SPECS
- SIZE 3.0" H x 3.6" W x 1.75" D (7.62 cm x 9.14 cm x 4.45 cm)
- WEIGHT 5 oz
- MOUNTING Directly to corner or to ceiling using **WV BR** bracket
- COLOR White

ELECTRICAL SPECS
- OPERATING VOLTAGE 12-24 VAC/VDC
- CURRENT DRAW Standard, 4 mA w/ **R** option, 16 mA
- RECOMMENDED POWER PACK PP20

ENVIRONMENTAL SPECS
- OPERATING TEMP 14° to 160° F (-10° to 71° C)
- STORAGE TEMP -14° to 160° F (-26° to 71° C)
- RELATIVE HUMIDITY 20 to 90% non-condensing

OTHER
- UL and CUL Listed
- Title 24 Compliant
- 5 Year Warranty
- Made in the U.S.A.

Classrooms are the ideal application for the **WV PDT 16** Dual Technology Wide View Sensor. Installed in the corner of the room along the entrance wall, this inconspicuous sensor provides line of sight PIR detection of small movements up to 40 ft (12.19 m) away, and combines overlapping Microphonics™ for detection around obstructions. Many classrooms are filled with shelving, projects, or lab benches. Total coverage of the room is always maintained no matter how cluttered the space becomes. The **WV PDT 16** is also used in corridors due to its ability to view up to 70 ft (21.34 m) for walking motions, or large open storage areas where obstructions may block the PIR's ability to view. For large lecture halls, multiple **WV PDT 16**s may be wired together, or along with any other low voltage sensors.

SENSOR OPERATION

The sensor has Passive Dual Technology (PDT), which first sees motion using Passive Infrared (PIR), and then engages Microphonics™ to hear sounds that indicate continued occupancy. This patented technology uses Automatic Gain Control (AGC) to dynamically self-adapt the sensor to its environment by filtering out constant background noise and detecting only noises typical of human activity. When occupancy is detected, a DC output goes high and can drive up to 200 mA of connected load. The sensor is powered with 12-24 VAC/VDC and typically operates with a **PP20** or **MP20** power pack, enabling complete 20 Amp circuits to be controlled. An internal timer, factory set at 10 minutes, keeps the lights on during brief periods of inactivity. This timer is push-button programmable from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected. This state-of-the-art sensor requires no field calibration or adjustment.

OPTIONS

LOW VOLTAGE RELAY (R)
- Enables sensors to interface with other systems (e.g., BMS, lighting panels)
- Provides dry contact closure via a SPDT, 1 Amp, 40 Volt relay
- Only one relay needed per zone
- Changes state when all connected sensors register unoccupied
- Relay requires sensor power to function

PHOTOCELL (P)
- Auto set-point calibration
- Two selectable modes of operation
- On/Off mode: Photocell has full control during periods of occupancy
- Inhibit mode: Photocell can prevent lights from turning on if adequate daylight is available, but cannot turn lights off

LOW TEMP/HIGH HUMIDITY (LT)
- Sensor is corrosion resistant to moisture
- Operates down to -4° F/ 20° C

ORDERING INFO

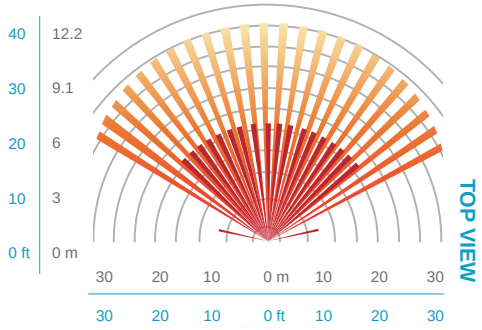
WV PDT 16 [RELAY] [PHOTOCELL] [TEMP/HUMIDITY]

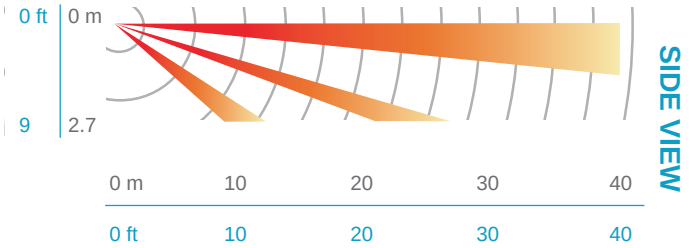
RELAY	PHOTOCELL	TEMP/HUMIDITY
Blank = None	**Blank = None**	**Blank = Standard**
R = Low Voltage Relay	**P = Photocell**	**LT = Low Temp**

COVERAGE PATTERN

16 WIDE VIEW LENS WITH MICROPHONICS™

- Small motion (e.g. hand movements) detection up to 40 ft (12.19 m).
- Large motion (e.g. walking) detection up to 70 ft (21.34 m).
- Designed for 8 to 10 ft (2.44 to 3.05 m) high mounting in room corner.
- Microphonics™ provides overlapping detection of human activity over the complete PIR coverage area. Advanced filtering is also utilized to prevent non-occupant noises from keeping the lights on.

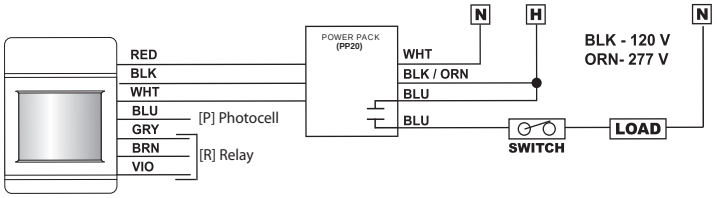




WIRING (DO NOT WIRE HOT)

STANDARD WIRING

RED - Power Input (12-24 VAC/VDC)
BLACK - Common
WHITE - Output (high VDC for occupancy)



RELAY OPTION (R)

GRAY/BROWN - Connected during occupied state
VIOLET/BROWN - Connected during unoccupied state
Note: Relay is energized during unoccupied state.

PHOTOCELL OPTION (P)

BLUE - Use in place of White ouput wire. Photocell output is high VDC with occupancy & low light. For multi-level control, use two power packs and connect White to primary load and Blue to daylight load.

INSTALLATION

- Sensor has rear enclosure, which is beveled so as to be corner mounted at 8-10 ft (2.44-3.05 m); see tilt settings below.
- Mount in corner above entrance door or in a corner along the same wall as the entrance. .
- For mounting heights above 10 ft (3.05 m), use the **WV BR** and mount sensor to angled side to provide an intial 30° look down.

TILT ADJUSTMENT
Mounting Height Position

7' - 8'	Vertical
8' - 9'	Center
9' - 10'	Forward
Above 10'	Use **WV BR**

CEILING MOUNT BRACKET (WV BR)

The **WV BR** Ceiling Mount Bracket allows the **WV PDT 16** to be mounted in the corner of the area from the ceiling for conditions where mounting to the wall is not possible.

PROGRAMMING

Refer to included instruction card for default settings and directions on programming the sensor via the push-button.

sensorswitch®
An AcuityBrands Company

T069-004P

900 Northrop Road, Wallingford, CT 06492 • 1.800.PASSIVE • FX 203.269.9621 • www.sensorswitch.com

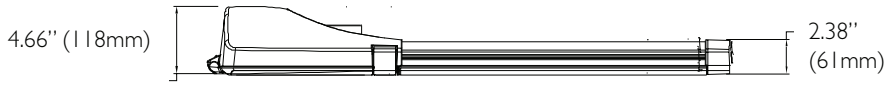
Print Form

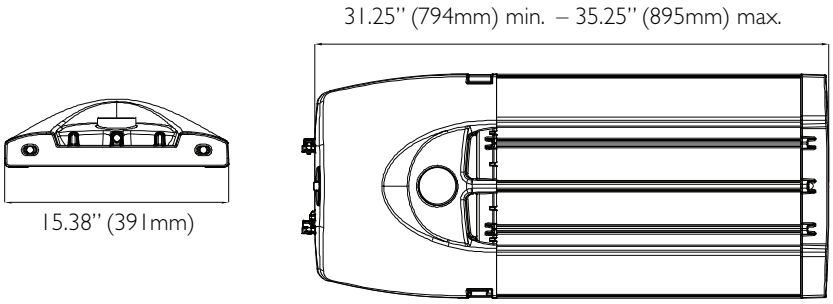
Project name		Type	
Date		Prepared by	

RVM					
Luminaire	Lamp	Optical system	Voltage	Options	Finish

RoadView LED Series

RVM





RVM
Weight: 34 to 37 lbs
(15.4 to 16.8 kg)

Lamps

LUMINAIRE PERFORMANCE DATA (Nominal 4000K CCT)												
							Weight		Length		EPA	
	Lamp	LEDs	Drive Current	Luminaire Lumens*	System Watts	Max. system current (amps)	lb.	kg.	in.	mm.	sq. ft.	sq. m.
☐	110W96LED4K	96	350	10516	105	0.88	34	15.4	31.25	794	0.71	0.066
☐	160W96LED4K	96	530	15196	160	1.33	34	15.4	31.25	794	0.71	0.066
☐	215W96LED4K	96	700	18646	208	1.73	34	15.4	31.25	794	0.71	0.066
☐	125W112LED4K	112	350	12589	120	1.00	34	15.4	31.25	794	0.71	0.066
☐	190W112LED4K	112	530	18193	183	1.53	34	15.4	31.25	794	0.71	0.066
☐	145W128LED4K	128	350	14150	137	1.14	34	15.4	31.25	794	0.71	0.066
☐	215W128LED4K	128	530	20448	209	1.74	34	15.4	31.25	794	0.71	0.066
☐	160W144LED4K	144	350	15559	154	1.28	37	16.8	35.25	895	0.78	0.072
☐	245W144LED4K	144	530	22484	235	1.96	37	16.8	35.25	895	0.78	0.072
☐	180W160LED4K	160	350	16370	170	1.42	37	16.8	35.25	895	0.78	0.072
☐	270W160LED4K	160	530	23657	260	2.17	37	16.8	35.25	895	0.78	0.072

**For Type III distribution. See photometric files for other distributions.*

PHILIPS

Optical systems / LED

- ☐ **LE2** TYPE II / Asymmetrical distribution
- ☐ **LE3** TYPE III / Asymmetrical distribution
- ☐ **LE4** TYPE IV / Asymmetrical distribution

Voltage

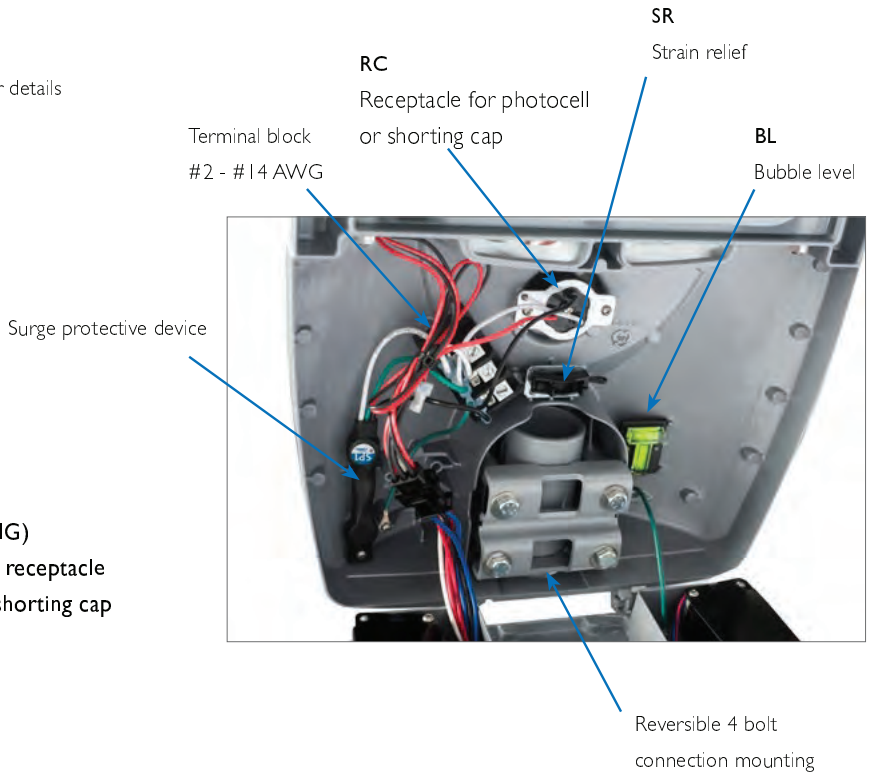
☐ UNIV (120-277) ☐ 347 ☐ 480

Driver options**

- ☐ **AST** Driver pre-programmed with progressive lamp starting*
- ☐ **CDMG** Dynadimmer standard dimming program*
- ☐ **CDMGP** Dynadimmer custom dimming program*
- ☐ **CLO** Constant Light Output, driver pre-programmed to achieve the same light intensity for the duration of the lifespan of the lamp*
- ☐ **DALI** Driver compatible with DALI control systems*
- ☐ **DMG** Dimmable driver 0-10 volt
- ☐ **OTL** Over The Life, driver pre-programmed to signal the end of lamp life*
- ☐ **OVR** Dynadimmer override function for use with motion detector or other switching device

*Only available with 120 - 277 volts.

** For all programmable options please consult the factory for details



Luminaire options

- ☐ **API** ANSI/NEMA wattage label
- ☐ **BL** Bubble level
- ☐ **OSL3W** Motion detector (requires DMG or CDMG)
- ☐ **PH8** Photoelectric cell, twistlock type includes receptacle
- ☐ **RC** Receptacle for a twist-lock photocell or shorting cap
- ☐ **SR** Strain relief

Specifications subject to change without notice.
Consult factory for full details.

Finish options

- ☐ **GY3** Gray
- ☐ **WH** White
- ☐ **BR** Bronze
- ☐ **BK** Black

☐ **EXP** Extrusion painted to match cast housing color selected above (standard extrusion color is anodized aluminum).

Additional colors are available. Consult factory for complete specifications.

LEDGINE

PHILIPS

Lamp
Composed of high performance white LEDs. ANSI Nominal CCT of 4000K, minimum 70 CRI. Ambient operating temperature range -40C (-40F) to +40C (104F). L70 lumen maintenance projected to be greater than 100,000 hours.

Optical system
Composed of high performance lenses, protected by a flat tempered glass lens. System is rated IP66. Photometric performance is tested according to IES LM-79.

Surge protector
Surge protective device provides all phases protection for line-ground, line-neutral, and neutral-ground in accordance with IEEE / ANSI C62.41.2 C High. Surge rating 10 kV, 10 kA and DOE Model Specification for Roadway Luminaires Elevated requirements per Appendix D. Surge protection is standard for all product models 120-480v.

Driver
Electronic driver, operating range 50-60 Hz. Auto-adjusting to input voltage between 120-277 volt AC, or 347-480 volt AC. Minimum power factor 0.90, max THD 20%. UL recognized component. 100,000 hours expected life. Optional dimming (0-10v) and digital driver features available.

Housing
The upper and lower parts of the housing are made of die cast A360 aluminum alloy. The 4-bolt mounting system includes a reversible bracket made of zinc plated steel. Fits on a 1.66" to 2.375" OD by 5" long tenon, fixed by 3/8-16 UNC steel zinc plated bolts. An integral part of the housing permits an adjustment of +/- 5° by steps of 2.5°.

Power door
The housing is complete with a tool-less removable power door including quick disconnects for ease of service. A tool free latch assembly on the power door allows for easy access to the electrical compartment.

Heat sink
The extruded heat sink is made of A6063 aluminum alloy, and is shaped to draw heat away from the LEDs. Product does not use any cooling device with moving parts (has passive cooling device).

LED platform
The LEDGINE LED platform consist of two LED boards with 48, 64, or 80 LUXEON Rebel LEDs each, as required to provide total LEDs from 96 - 160. The LED boards are removable and replaceable.

Wiring
Luminaire wiring is done using a terminal block located inside the housing. Terminal block accepts three wires (#2-14 AWG).

Hardware and seals
All hardware shall be stainless steel or corrosion resistant. All seals and sealing devices are lined with silicone.

Finish
Application of a polyester powder coat paint. (4 mils/100 microns). The chemical composition provides a highly durable UV and salt spray resistant finish in accordance with the ASTM-B117 standard and humidity proof in accordance with the ASTM-D2247 standard. The specially formulated Lumital powder coat finish is available in standard gray. Additional colors are available. Consult factory for complete specifications.

Vibration resistance
Meets the ANSI C136.31-2001 table 2, American National Standard for Roadway Luminaire Vibration specifications for Bridge/overpass applications (3G).

Certifications and Compliance
CSA, UL or cUL. ISO 9001-2008. All electrical components are RoHS compliant. Listed on Design Lights Consortium (DLC) Qualified Products List (QPL).

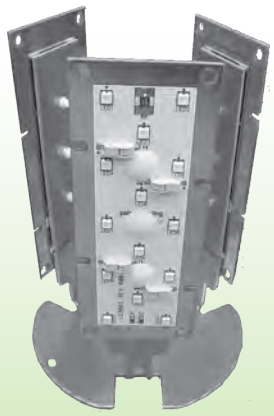
Document order number: RVMTS100R02

Philips Roadway Lighting
10275 W. Higgins Road
Rosemont IL 60018
Tel: 847-390-5111 Fax: 847-332-0305
Customer Support/Technical Service: 847-390-5111
www.philips.com/roadwaylighting
A Division of Genlyte Thomas Group LLC

XtraLight MANUFACTURING

PROJECT INFORMATION	
Project Name	Type
Catalog #	Date

LED ACORN RETROFIT KIT

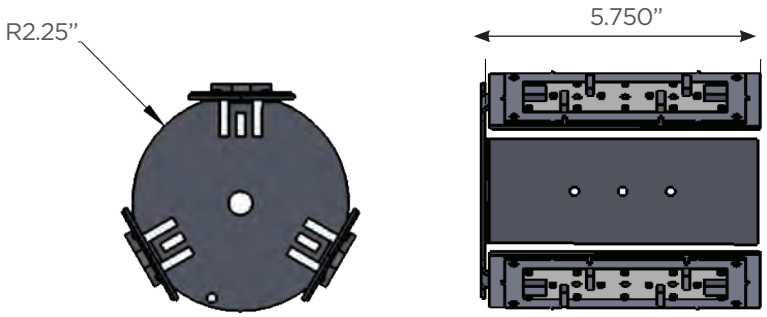


3-card model shown

FEATURES

- High energy efficiency
- Exceptional Light Quality

DIMENSIONAL DATA



APPLICATION

- Decorative post top retrofit for commercial and retail installations where significant energy reduction and extended life is required.

CONSTRUCTION

- High grade aluminum body with field-adjustable arms for optimum light distribution.
- Replaceable, RoHS-compliant LED modules heat sunk to body for enhanced life.

ELECTRICAL

- LED Module - Three or four LEDLinX rectangular modules.
- Driver - 24V dc electronic power supply factory calibrated to LED modules.
- Life - >50,000 hour rated life at 70% initial lumens (L70).
- Wiring - Internal factory wiring and pre-installed LED module.
- Approvals - Complies with UL Std1598/CSA 22.2 Suitable for wet locations.

WARRANTY

- 5 year warranty on solid state components.
- Consult factory for warranty details.

ORDER LOGIC

ARK	LED					
	LED	Length (in feet)	# LinX	Wattage	Optics	CCT
		01	03	030	N-Normal	3-3500K
			04	040	S-Spread	4-4100K (std.)
					D-Diffuse	5-5200K

Assembled in USA

BS100LED

INDUSTRIAL

Type: _____

Project: _____

The **ILLUMINA®** BS100LED features eight (8) closure clips that securely and evenly seal the luminaire

The **ILLUMINA®** BS100LED is corrosion, flame and vandal resistant

Unique three piece design that allows effortless assembly without any tools

DIFFUSER: The UV stabilized polycarbonate diffuser eliminates glare and is integrated with crystals that assist in the enhancement of even light distribution. (clear lens optional).

The **ILLUMINA®** BS100LED is ideal for low bay, linear, surface, suspended, outdoor, indoor, retail, industrial, parking garage, carport, parking structures, warehouses, breezeways, canopies schools and much more.

CONFIGURATIONS

MODEL	LENGTH	OPERATION	POWER	LED/PERFORMANCE	INPUT	MOUNTING	OPTIONS
BS100LED	**4** (4ft)	**HT** (AC only)	**50W**	**WT30** (3000K)	**120/277V**	**AC_**[2] (aviation cable)	**CL** (clear lens)
BS100LED-RK[1]			**80W**	**WT41** (4100K)	**347V**	**SPK_**[3] (single pendant kit)	**SS** (stainless steel clips)
				WT57 (5700K)	**480V**	**DPK_**[3] (double pendant kit)	**OS** (occupancy sensor)
						CH_[3] (chain hang kit)	**OSW**[5] (occupancy sensor-wet)
						TM_[3] (trunion mount)	**FP** (fuse protection)
						JM[4] (direct mount to j-box)	**SL** (sanitation listed)
						MM (magnetic mount)	**TP**[6] (tamper proof screws)
						PM (pivot mount)	

NOTE[1]: RK=Retro Fit Kit; Mounting options DO NOT apply to BS100LED-RK unit.

NOTE[2]: specify length for AC: 72", 150", 250" fully adjustable; NOTE[3]: SPK, DPK, CH & TM options, min 6". Note[4]: JM option - the unit is no longer wet location / IP66 rated.

NOTE[5]: wet location OC; NOTE[6]: TP-tamper proof screws require a special bit (TPB), order as needed.

HOUSING: 100% UV stabilized polycarbonate, liquid silicone perimeter gasket with memory retention, integrated stainless steel mounting brackets.

REFLECTOR: Flat, steel reflector system finished in durable powder coat white. LED boards are secured to the reflector using a spotted slot system. The reflector system holds all electrical components.

ELECTRICAL: Each 4ft fixture utilizes two high-efficiency LED boards. Available in 3000K, 4100K or 5700K color temperatures as standard, High efficiency driver operates 100V through 277V, 347V through 480V, 50-60HZ. Fuse protection (FP) option available. Drivers used: 50W and 80W. Dimming capabilities standard (0-10V). L70 up to 100,000 hours. (see next page for more info.)

MOUNTING: Surface mount configuration as standard. Additional mounting systems are available: including aviation cable, pendants, chain, trunion, magnetic, pivot and direct to junction box configurations. Suspension height is to be specified when ordering any suspension mount units: AC, SPK, DPK, CH & TM. (JM configuration mounts directly to the j-box; no longer complies with IP66 wet location rating. Fixture will be suitable for damp environments only.)

POWER LINE/FEED: 3-wire, solid type 18awg, pre-stripped 12" leads for quick in-field connection and hot load disconnect feature.

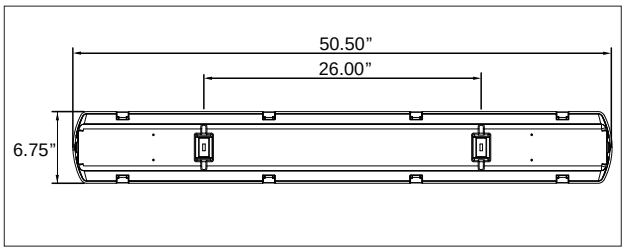
DIMMING: 0 - 10V dimming is standard.

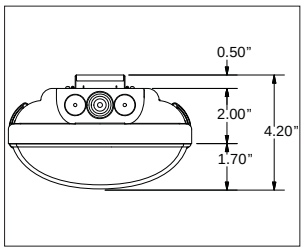
WEIGHT: 10 lbs. / 4.5 kilo.

OPERATING TEMPERATURE: -30˚C to 50˚C

RETROFIT KIT (BS100LED-RK): A quick upgrade system for your existing fluorescent BS100 units. Designed to easily snap into the existing BS100 housing. Engineered to save you time and labor. Includes the polycarbonate diffuser, the steel reflector, LED module and driver.

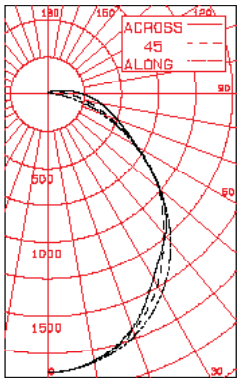
WARRANTY: 5 year warranty, see website for full warranty details.





BS100LED-4HT-80W-WT41-120/277V

CANDELA DISTRIBUTION



INTENSITY(CANDLEPOWER)				SUMMARY		OUTPUT LUMENS
ANGLE	ALONG	22.5	45	67.5	ACROSS	
0	2334	2334	2334	2334	2334	
5	2305	2323	2320	2327	2327	224
15	2214	2221	2208	2205	2207	622
25	2035	2021	1991	1970	1962	916
35	1762	1742	1684	1648	1646	1059
45	1413	1389	1354	1391	1401	1065
55	1025	1007	1040	1050	1045	922
65	647	655	689	707	714	678
75	318	347	408	474	498	435
85	74	129	219	303	332	237
90	29	69	153	233	260	
95	25	38	107	177	196	120
105	16	16	51	93	105	59
115	8	7	20	42	50	25
125	4	3	6	15	19	8
135	1	0	1	4	5	2
145	0	0	0	0	0	0
155	0	0	0	0	0	0

Tested in accordance with IESN9 LM-79-2012

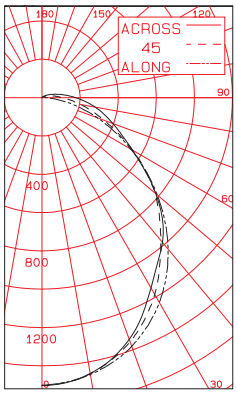
Max Candela:	2334	CIE Class:	Direct
Efficiency Total:	100%	Lumen Rating:	6373
Efficacy Total:	91.8 lm/W	Input Wattage:	69.5W

ZONAL LUMEN SUMMARY

ZONE	LUMENS	% LAMP	% LUMINAIRE
0-30	1760	27.63	27.63
0-40	2819	44.25	44.25
0-60	4806	75.43	75.43
0-90	6158	96.63	96.63
40-90	3338	52.39	52.39
60-90	1351	21.20	21.20
90-180	214	3.37	3.37
0-180	6373	100.00	100.00

BS100LED-4-HT-50W-WT30-120/277V

CANDELA DISTRIBUTION



INTENSITY(CANDLEPOWER)				SUMMARY		OUTPUT LUMENS
ANGLE	ALONG	22.5	45	67.5	ACROSS	
0	1502	1502	1502	1502	1502	
5	1490	1496	1490	1493	1493	144
15	1431	1429	1417	1412	1412	399
25	1314	1301	1277	1256	1249	587
35	1138	1119	1077	1057	1057	680
45	912	893	871	892	894	684
55	664	650	667	664	659	590
65	421	426	441	457	464	439
75	210	228	270	319	338	290
85	52	88	150	208	228	163
90	19	48	106	161	176	
95	16	27	75	121	132	82
105	10	10	36	62	69	40
115	5	4	13	28	33	17
125	2	2	4	10	12	5
135	0	0	0	2	3	1
145	0	0	0	0	0	0

Tested in accordance with IESN9 LM-79-2012

Max Candela:	1502	CIE Class:	Direct
Efficiency Total:	100%	Lumen Rating:	4120
Efficacy Total:	88.0 lm/W	Input Wattage:	46.8W

ZONAL LUMEN SUMMARY

ZONE	LUMENS	% LAMP	% LUMINAIRE
0-30	1129	27.43	27.43
0-40	1809	43.93	43.93
0-60	3083	74.85	74.85
0-90	3974	96.48	96.48
40-90	2164	52.55	52.55
60-90	891	21.63	21.63
90-180	145	3.52	3.52
0-180	4120	100.00	100.00

ENERGY COMPARISON CHART

LAMP	LENGTH	EFFICACY	CONSUMPTION WATTAGE	LUMEN OUTPUT	CRI	mAmps (per board)	AMBIENT TEMP	L70 (hrs.)
BS100LED-30W-WT41	4FT	98 lm/W	29.7	2900	85+	525	50˚C	100,000
BS100LED-50W-WT30	4FT	88 lm/W	46.8	4100	80+	525	50˚C	100,000
BS100LED-50W-WT41	4FT	96 lm/W	47.8	4600	80+	525	50˚C	100,000
BS100LED-80W-WT30	4FT	84 lm/W	70.0	5900	80	750	50˚C	75,000
BS100LED-80W-WT41	4FT	92 lm/W	69.0	6400	85+	750	50˚C	75,000

Each fixture utilizes 2 (two) high-efficiency LED boards.

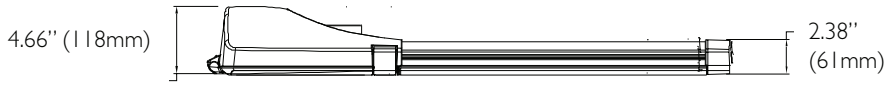
Print Form

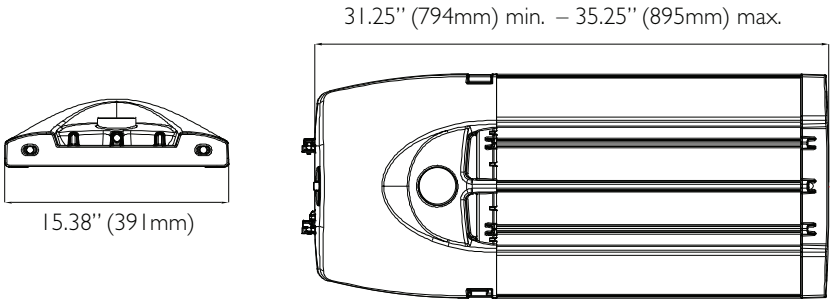
Project name		Type	
Date		Prepared by	

RVM					
Luminaire	Lamp	Optical system	Voltage	Options	Finish

RoadView LED Series

RVM





RVM
Weight: 34 to 37 lbs
(15.4 to 16.8 kg)

Lamps

LUMINAIRE PERFORMANCE DATA (Nominal 4000K CCT)												
							Weight		Length		EPA	
	Lamp	LEDs	Drive Current	Luminaire Lumens*	System Watts	Max. system current (amps)	lb.	kg.	in.	mm.	sq. ft.	sq. m.
☐	110W96LED4K	96	350	10516	105	0.88	34	15.4	31.25	794	0.71	0.066
☐	160W96LED4K	96	530	15196	160	1.33	34	15.4	31.25	794	0.71	0.066
☐	215W96LED4K	96	700	18646	208	1.73	34	15.4	31.25	794	0.71	0.066
☐	125W112LED4K	112	350	12589	120	1.00	34	15.4	31.25	794	0.71	0.066
☐	190W112LED4K	112	530	18193	183	1.53	34	15.4	31.25	794	0.71	0.066
☐	145W128LED4K	128	350	14150	137	1.14	34	15.4	31.25	794	0.71	0.066
☐	215W128LED4K	128	530	20448	209	1.74	34	15.4	31.25	794	0.71	0.066
☐	160W144LED4K	144	350	15559	154	1.28	37	16.8	35.25	895	0.78	0.072
☐	245W144LED4K	144	530	22484	235	1.96	37	16.8	35.25	895	0.78	0.072
☐	180W160LED4K	160	350	16370	170	1.42	37	16.8	35.25	895	0.78	0.072
☐	270W160LED4K	160	530	23657	260	2.17	37	16.8	35.25	895	0.78	0.072

**For Type III distribution. See photometric files for other distributions.*

PHILIPS

Optical systems / LED

- ☐ **LE2** TYPE II / Asymmetrical distribution
- ☐ **LE3** TYPE III / Asymmetrical distribution
- ☐ **LE4** TYPE IV / Asymmetrical distribution

Voltage

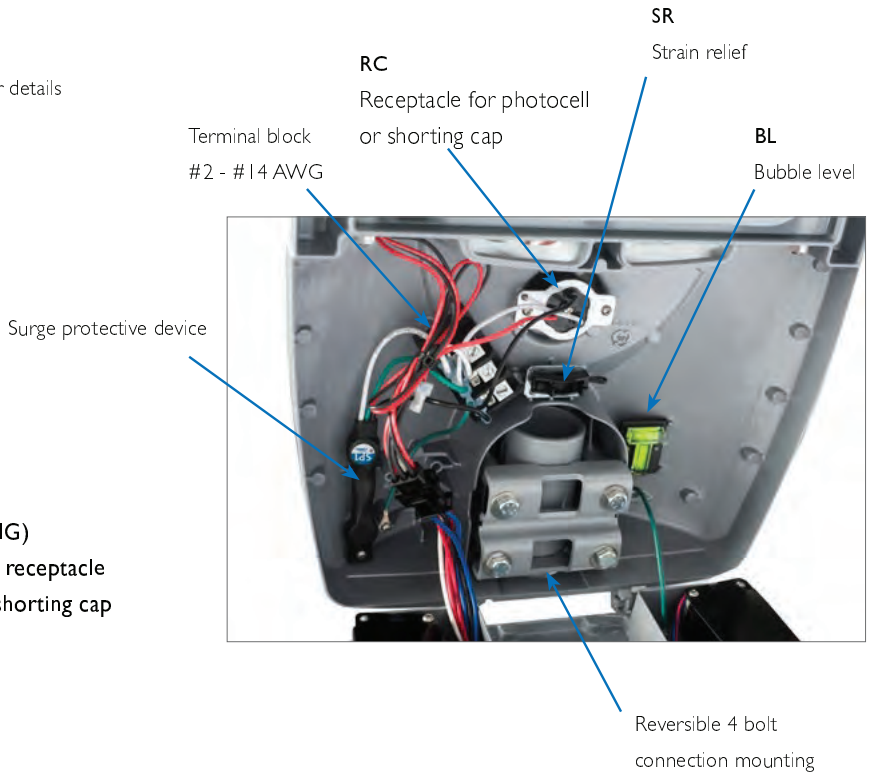
☐ UNIV (120-277) ☐ 347 ☐ 480

Driver options**

- ☐ **AST** Driver pre-programmed with progressive lamp starting*
- ☐ **CDMG** Dynadimmer standard dimming program*
- ☐ **CDMGP** Dynadimmer custom dimming program*
- ☐ **CLO** Constant Light Output, driver pre-programmed to achieve the same light intensity for the duration of the lifespan of the lamp*
- ☐ **DALI** Driver compatible with DALI control systems*
- ☐ **DMG** Dimmable driver 0-10 volt
- ☐ **OTL** Over The Life, driver pre-programmed to signal the end of lamp life*
- ☐ **OVR** Dynadimmer override function for use with motion detector or other switching device

*Only available with 120 - 277 volts.

** For all programmable options please consult the factory for details



Luminaire options

- ☐ **API** ANSI/NEMA wattage label
- ☐ **BL** Bubble level
- ☐ **OSL3W** Motion detector (requires DMG or CDMG)
- ☐ **PH8** Photoelectric cell, twistlock type includes receptacle
- ☐ **RC** Receptacle for a twist-lock photocell or shorting cap
- ☐ **SR** Strain relief

Specifications subject to change without notice.
Consult factory for full details.

Finish options

- ☐ **GY3** Gray
- ☐ **WH** White
- ☐ **BR** Bronze
- ☐ **BK** Black

☐ **EXP** Extrusion painted to match cast housing color selected above (standard extrusion color is anodized aluminum).

Additional colors are available. Consult factory for complete specifications.

LEDGINE

PHILIPS

Lamp
Composed of high performance white LEDs. ANSI Nominal CCT of 4000K, minimum 70 CRI. Ambient operating temperature range -40C (-40F) to +40C (104F). L70 lumen maintenance projected to be greater than 100,000 hours.

Optical system
Composed of high performance lenses, protected by a flat tempered glass lens. System is rated IP66. Photometric performance is tested according to IES LM-79.

Surge protector
Surge protective device provides all phases protection for line-ground, line-neutral, and neutral-ground in accordance with IEEE / ANSI C62.41.2 C High. Surge rating 10 kV, 10 kA and DOE Model Specification for Roadway Luminaires Elevated requirements per Appendix D. Surge protection is standard for all product models 120-480v.

Driver
Electronic driver, operating range 50-60 Hz. Auto-adjusting to input voltage between 120-277 volt AC, or 347-480 volt AC. Minimum power factor 0.90, max THD 20%. UL recognized component. 100,000 hours expected life. Optional dimming (0-10v) and digital driver features available.

Housing
The upper and lower parts of the housing are made of die cast A360 aluminum alloy. The 4-bolt mounting system includes a reversible bracket made of zinc plated steel. Fits on a 1.66" to 2.375" OD by 5" long tenon, fixed by 3/8-16 UNC steel zinc plated bolts. An integral part of the housing permits an adjustment of +/- 5° by steps of 2.5°.

Power door
The housing is complete with a tool-less removable power door including quick disconnects for ease of service. A tool free latch assembly on the power door allows for easy access to the electrical compartment.

Heat sink
The extruded heat sink is made of A6063 aluminum alloy, and is shaped to draw heat away from the LEDs. Product does not use any cooling device with moving parts (has passive cooling device).

LED platform
The LEDGINE LED platform consist of two LED boards with 48, 64, or 80 LUXEON Rebel LEDs each, as required to provide total LEDs from 96 - 160. The LED boards are removable and replaceable.

Wiring
Luminaire wiring is done using a terminal block located inside the housing. Terminal block accepts three wires (#2-14 AWG).

Hardware and seals
All hardware shall be stainless steel or corrosion resistant. All seals and sealing devices are lined with silicone.

Finish
Application of a polyester powder coat paint. (4 mils/100 microns). The chemical composition provides a highly durable UV and salt spray resistant finish in accordance with the ASTM-B117 standard and humidity proof in accordance with the ASTM-D2247 standard. The specially formulated Lumital powder coat finish is available in standard gray. Additional colors are available. Consult factory for complete specifications.

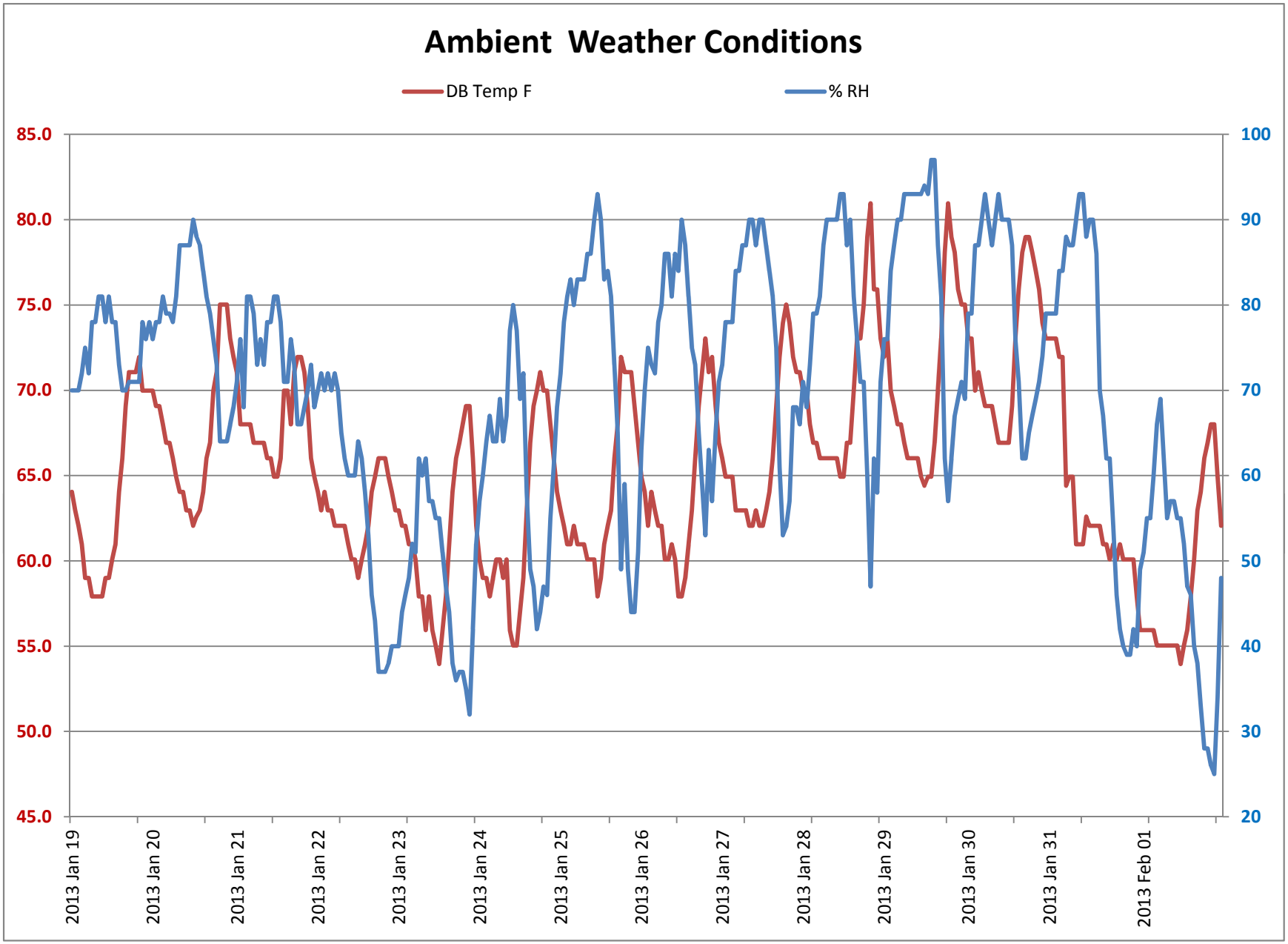
Vibration resistance
Meets the ANSI C136.31-2001 table 2, American National Standard for Roadway Luminaire Vibration specifications for Bridge/overpass applications (3G).

Certifications and Compliance
CSA, UL or cUL. ISO 9001-2008. All electrical components are RoHS compliant. Listed on Design Lights Consortium (DLC) Qualified Products List (QPL).

Document order number: RVMTS100R02

Philips Roadway Lighting
10275 W. Higgins Road
Rosemont IL 60018
Tel: 847-390-5111 Fax: 847-332-0305
Customer Support/Technical Service: 847-390-5111
www.philips.com/roadwaylighting
A Division of Genlyte Thomas Group LLC

Appendix B – Temperature and Humidity **Samples**


Ambient Weather Conditions
DB Temp F
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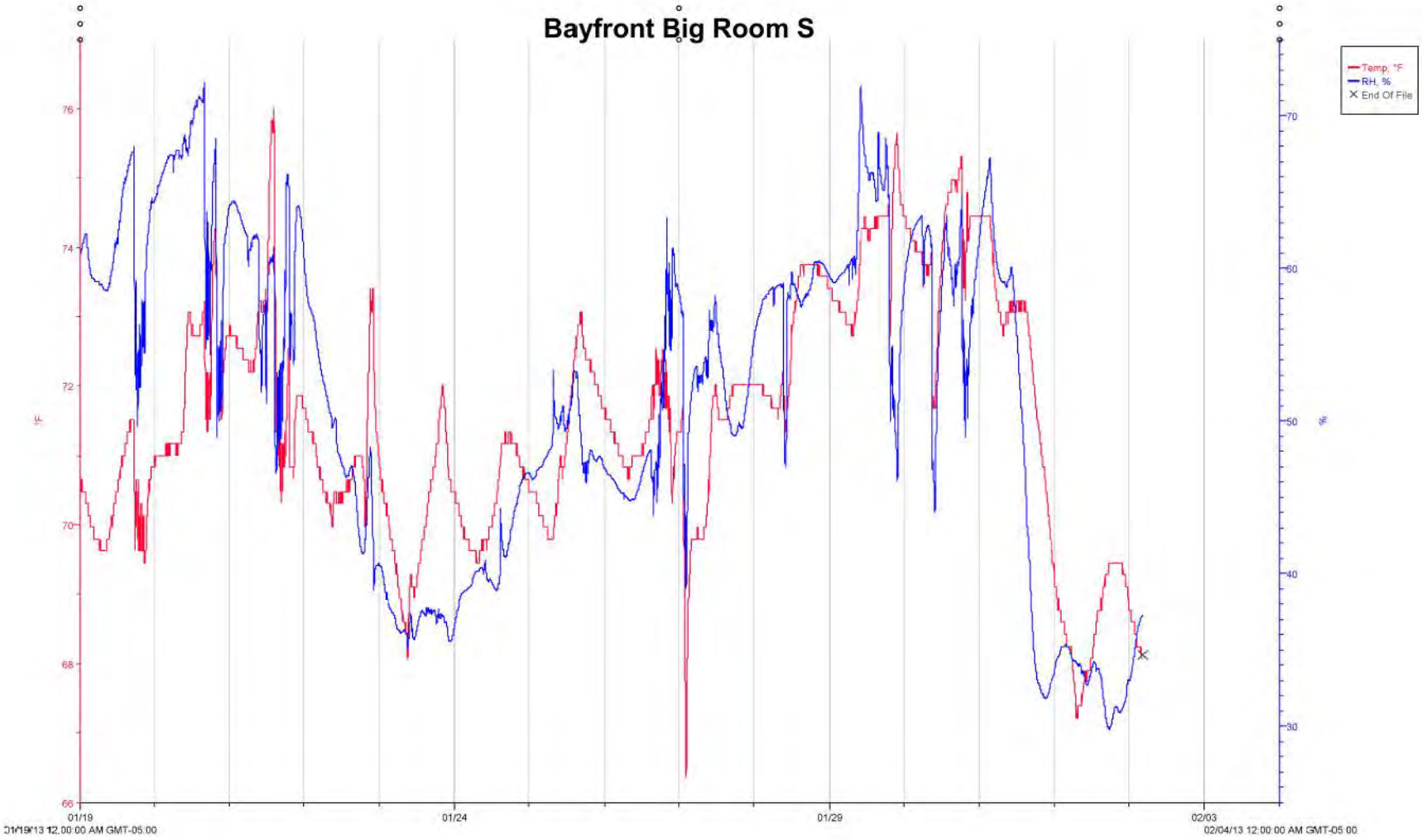
2013 Feb 01


Bayfront Big Room S
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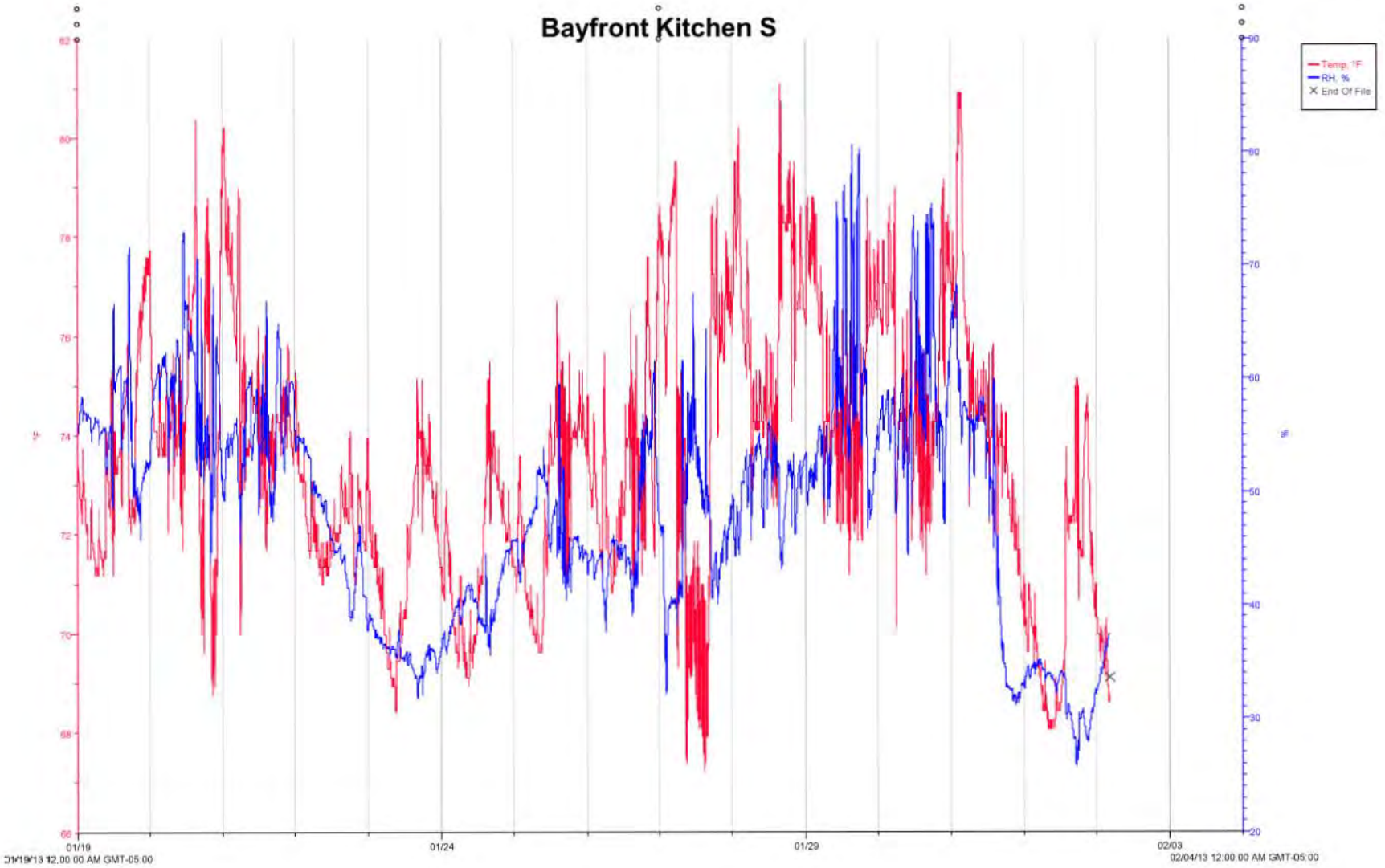
02/04/13 12:00:00 AM GMT-05:00


Bayfront Kitchen S
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RH, %
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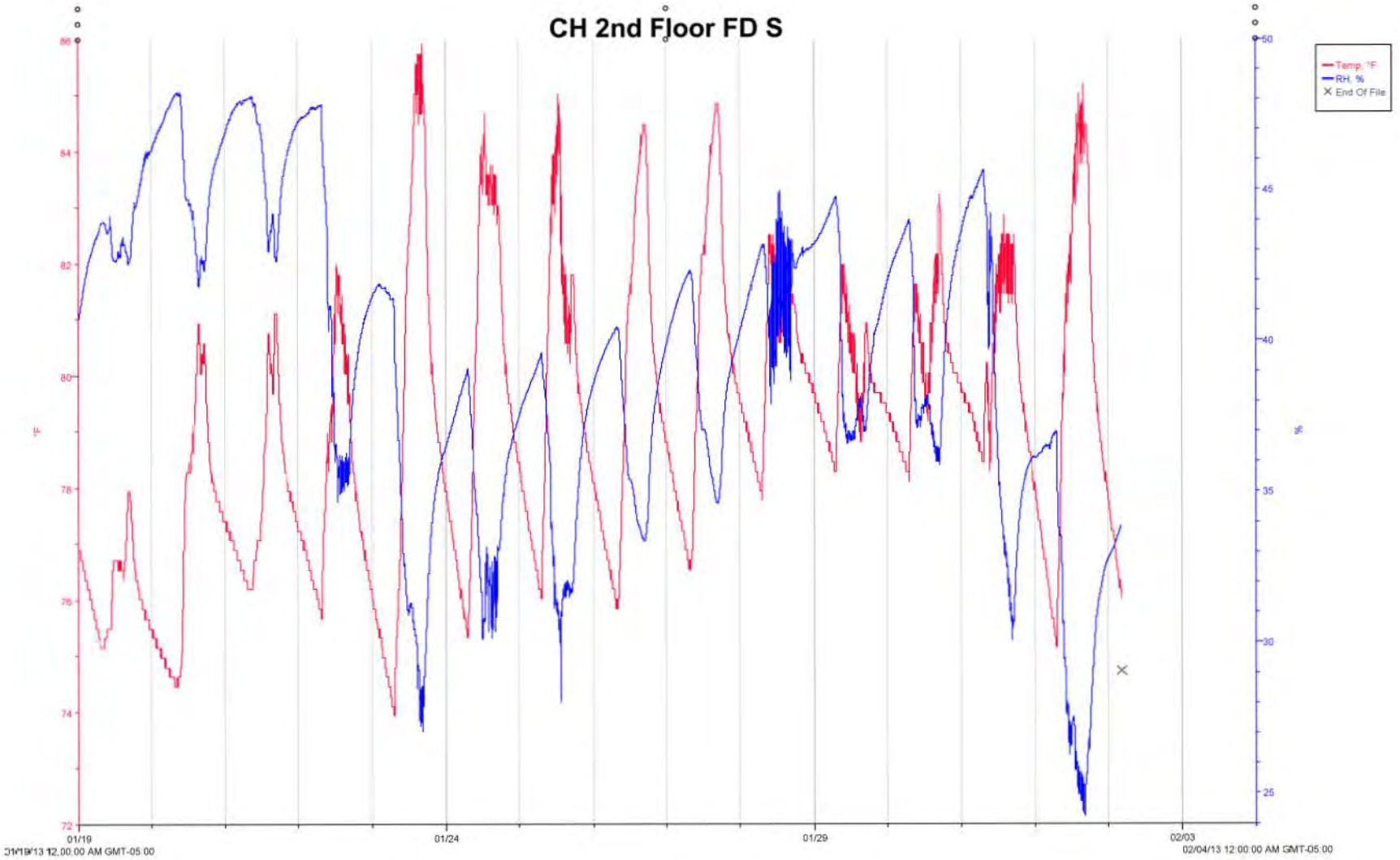
CH 2nd Floor FD S
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RH, %
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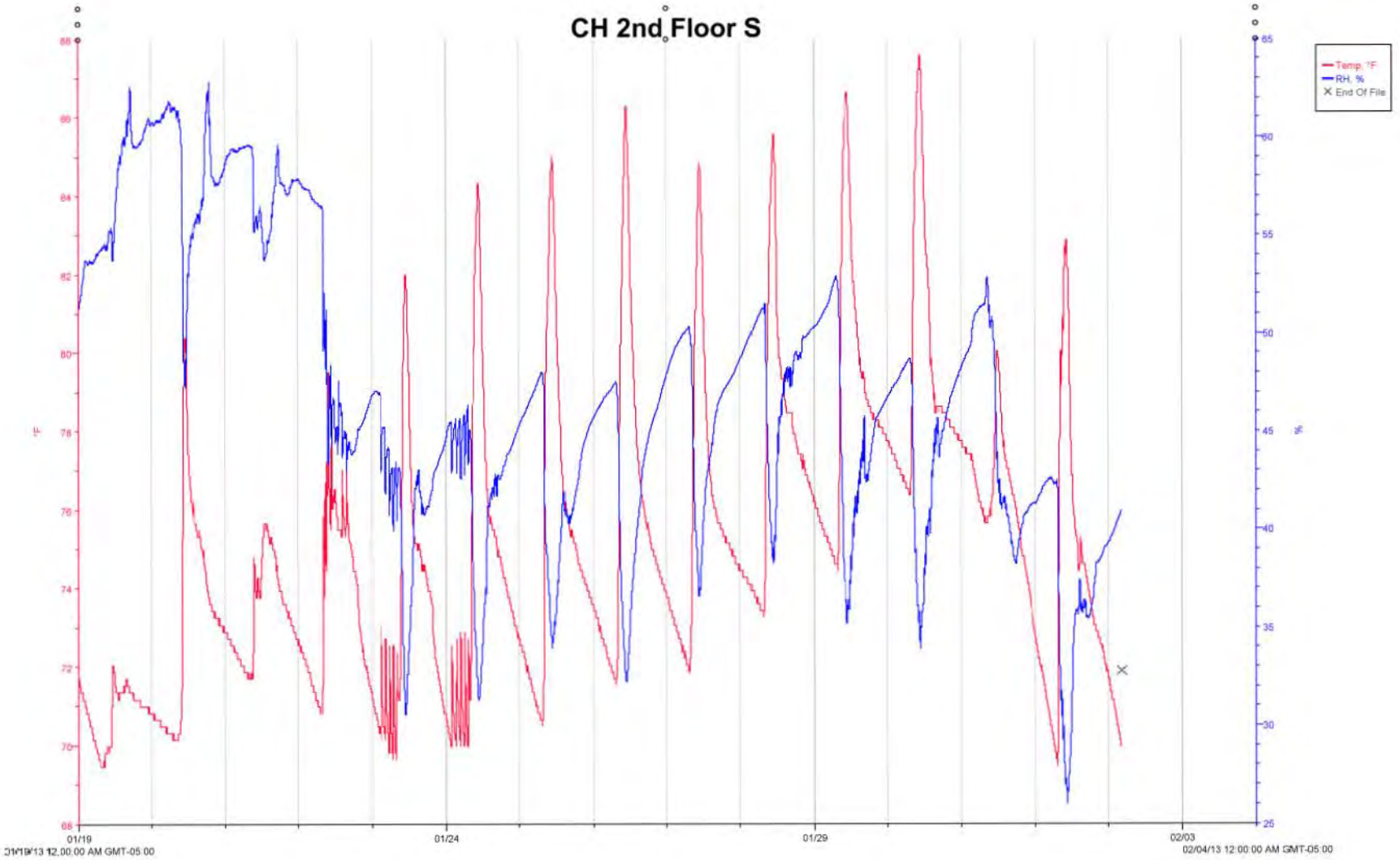
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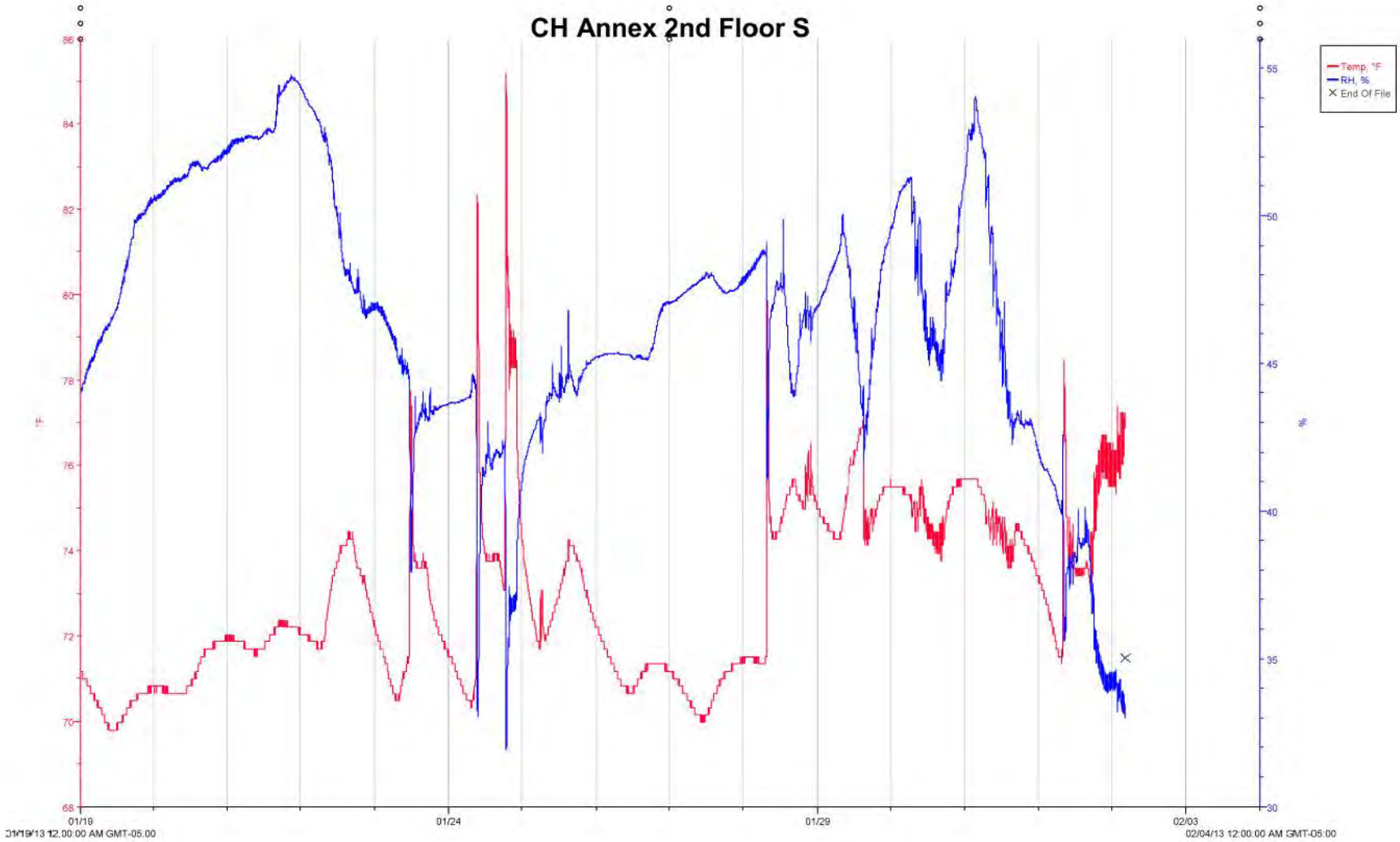
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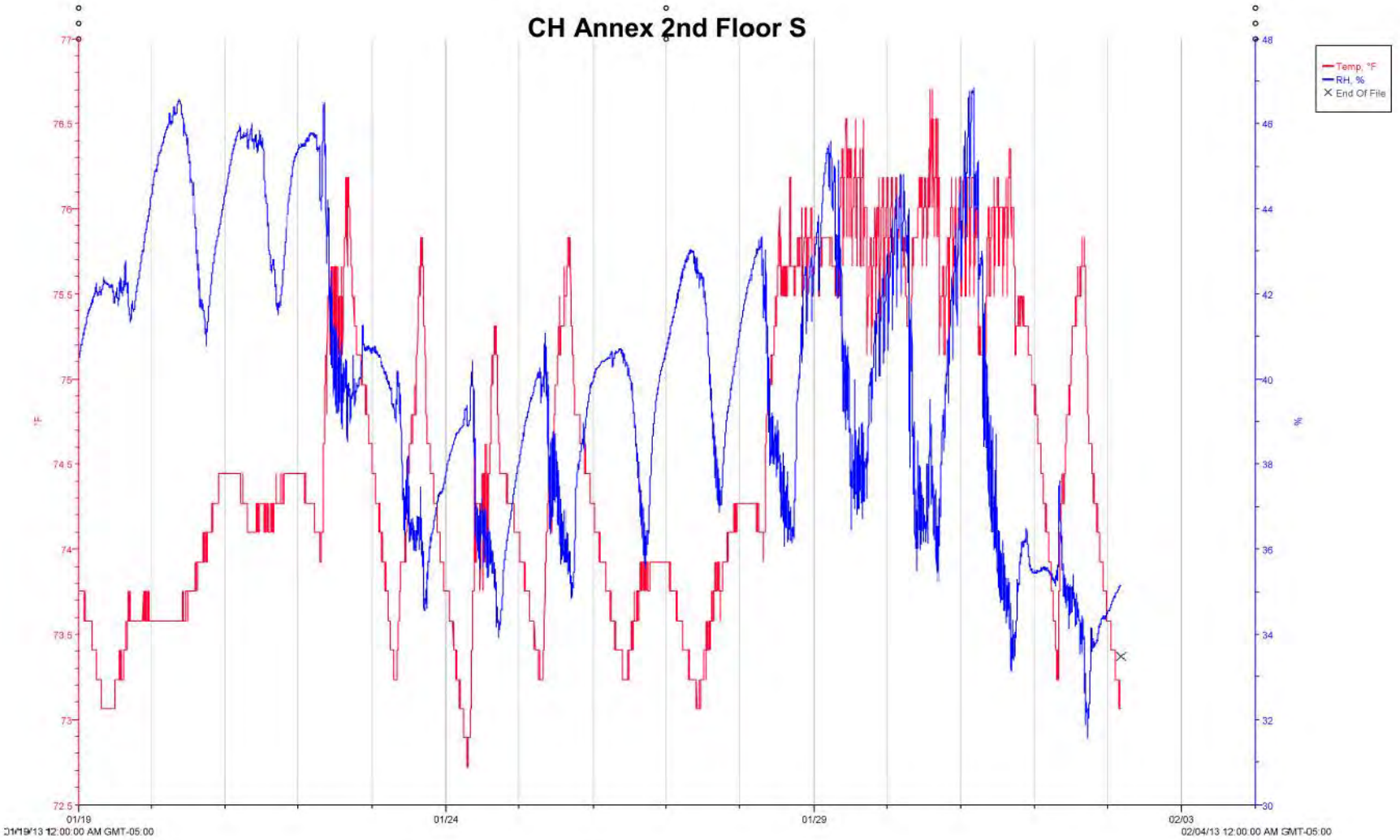
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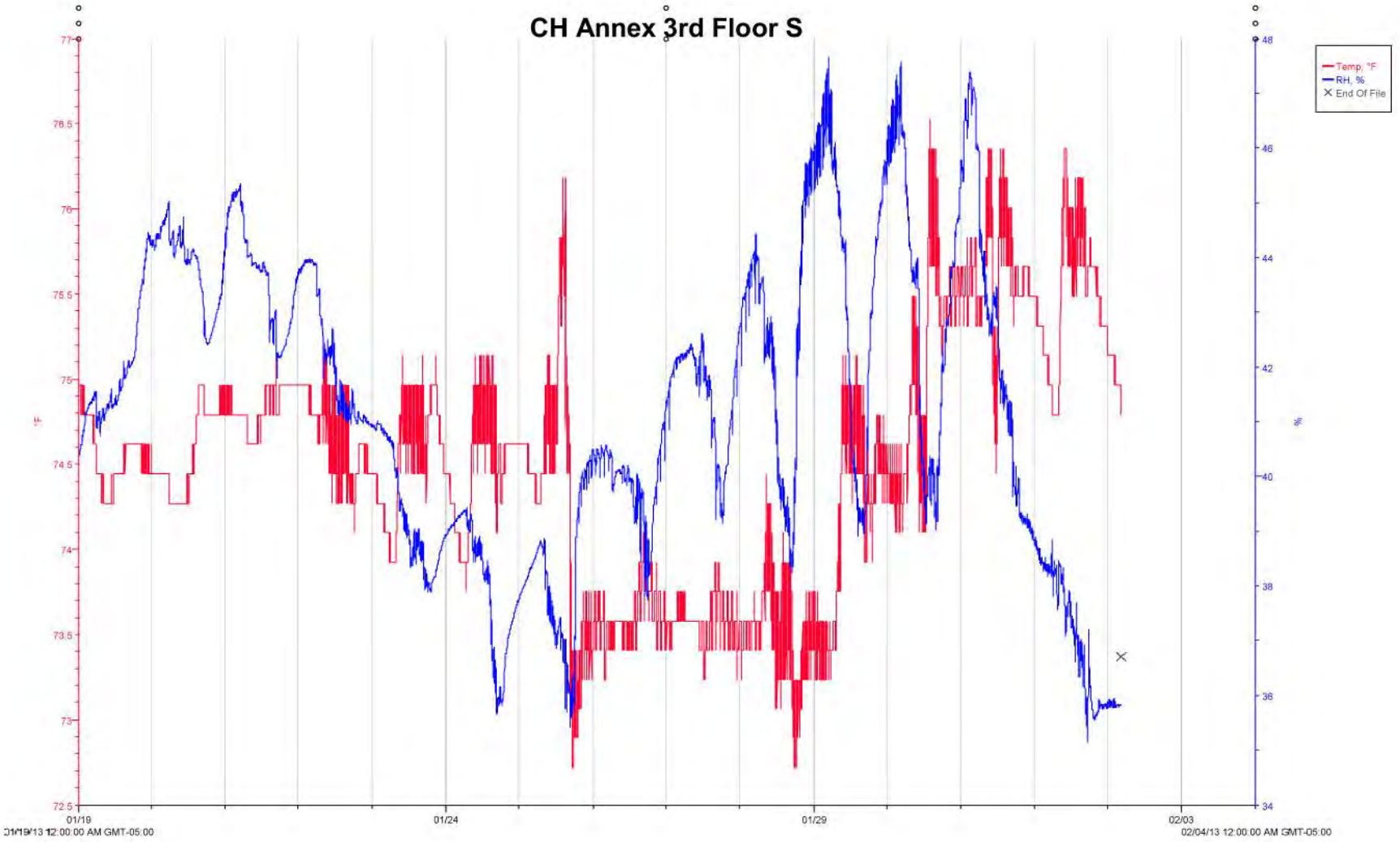
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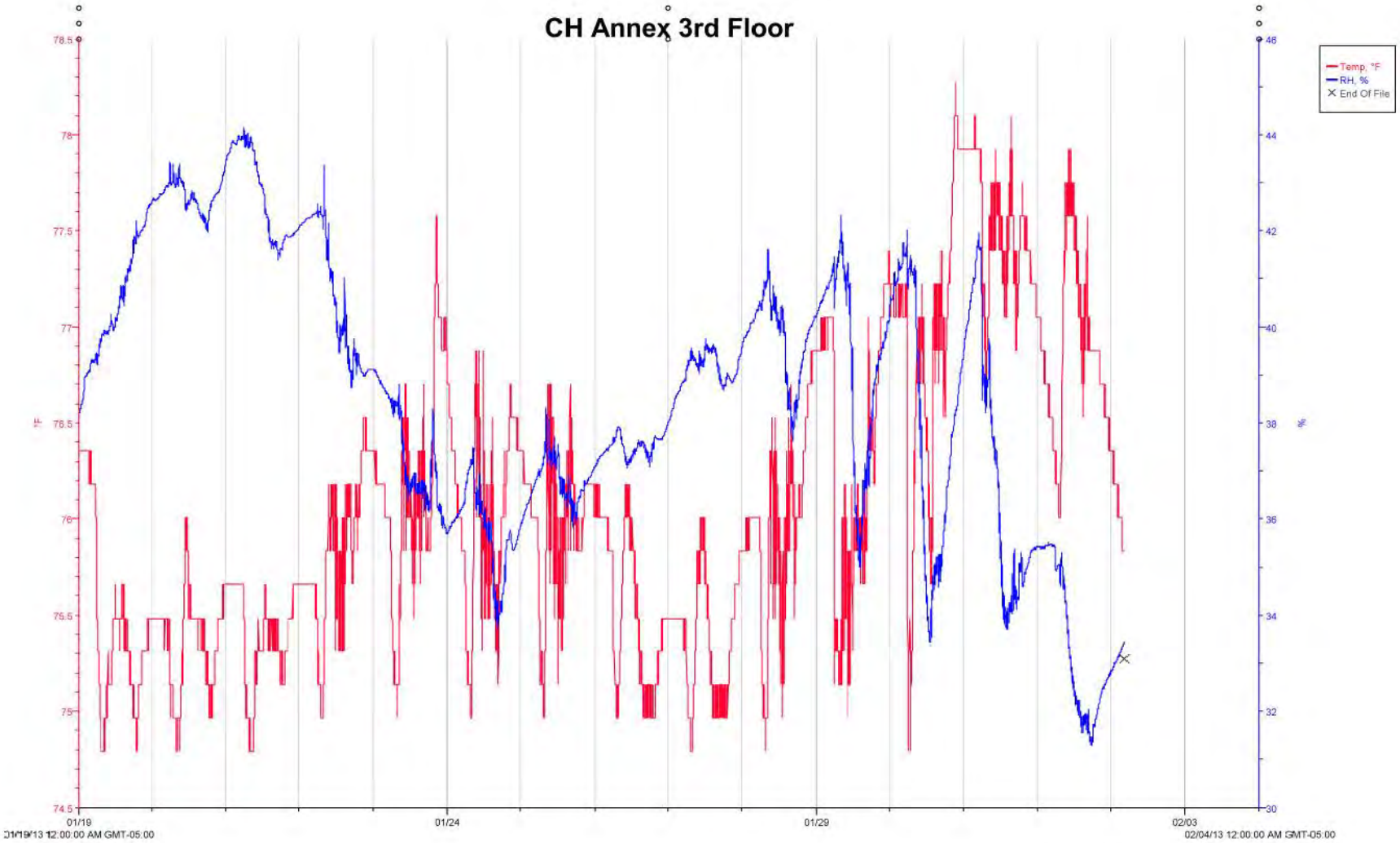
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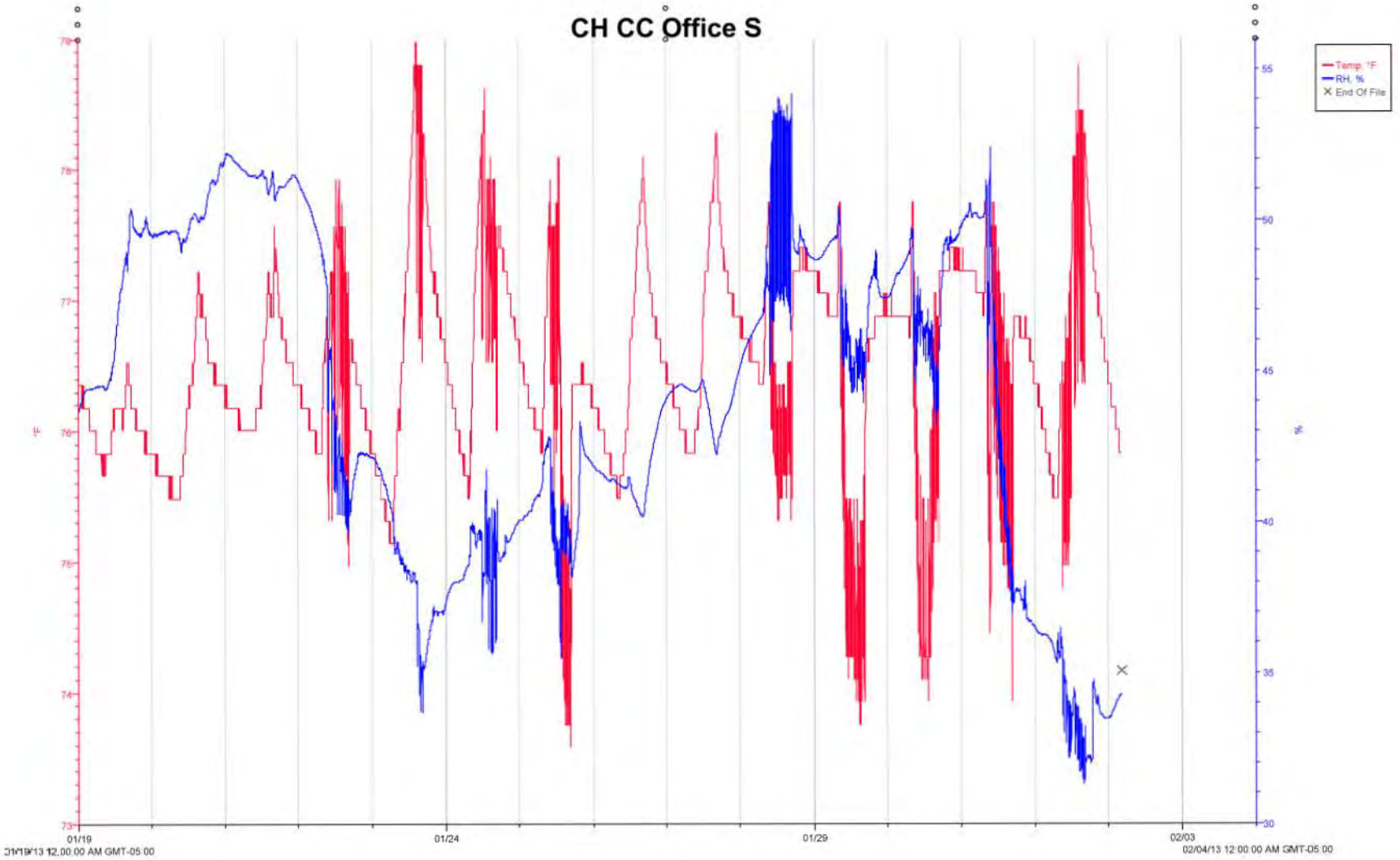
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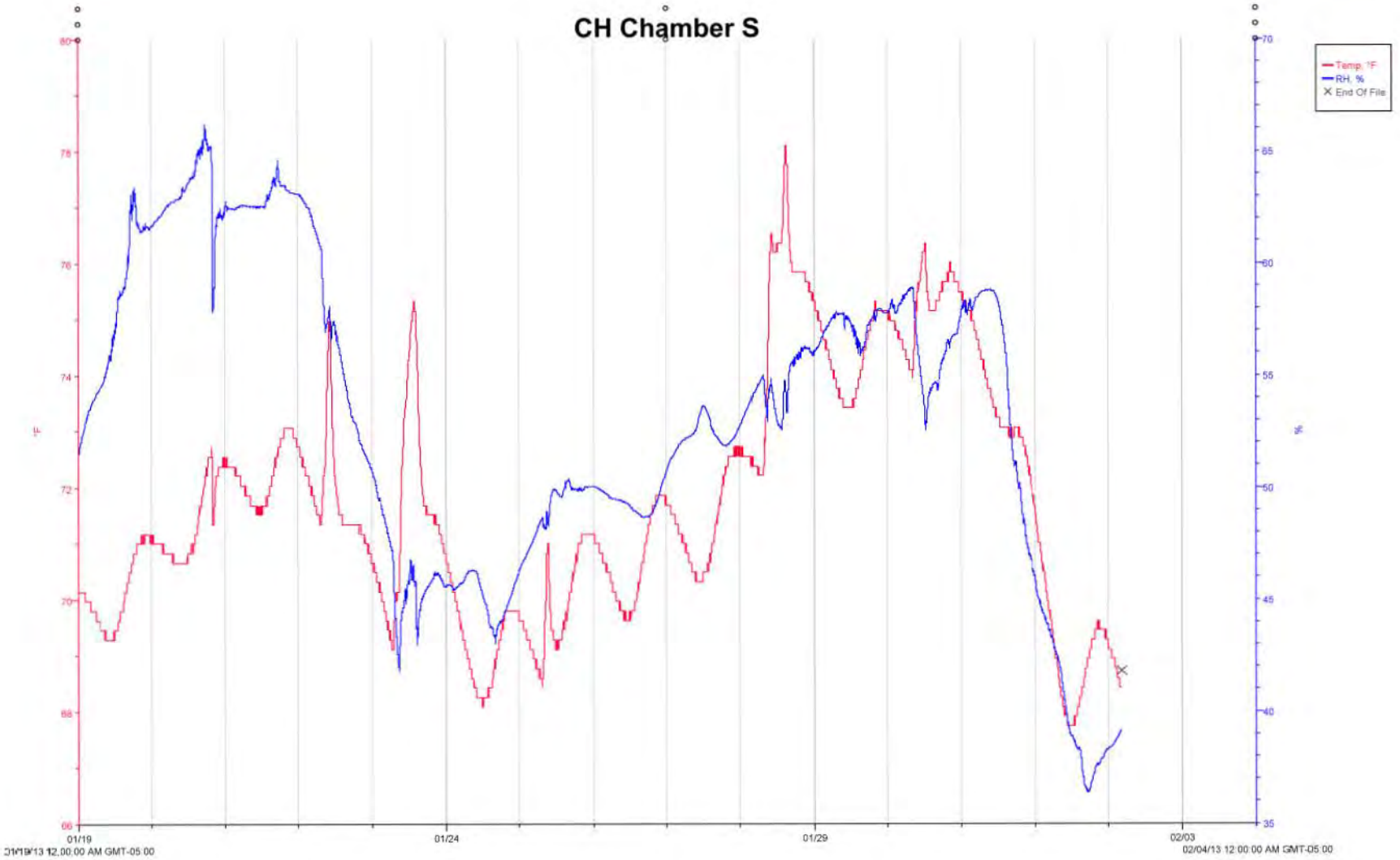
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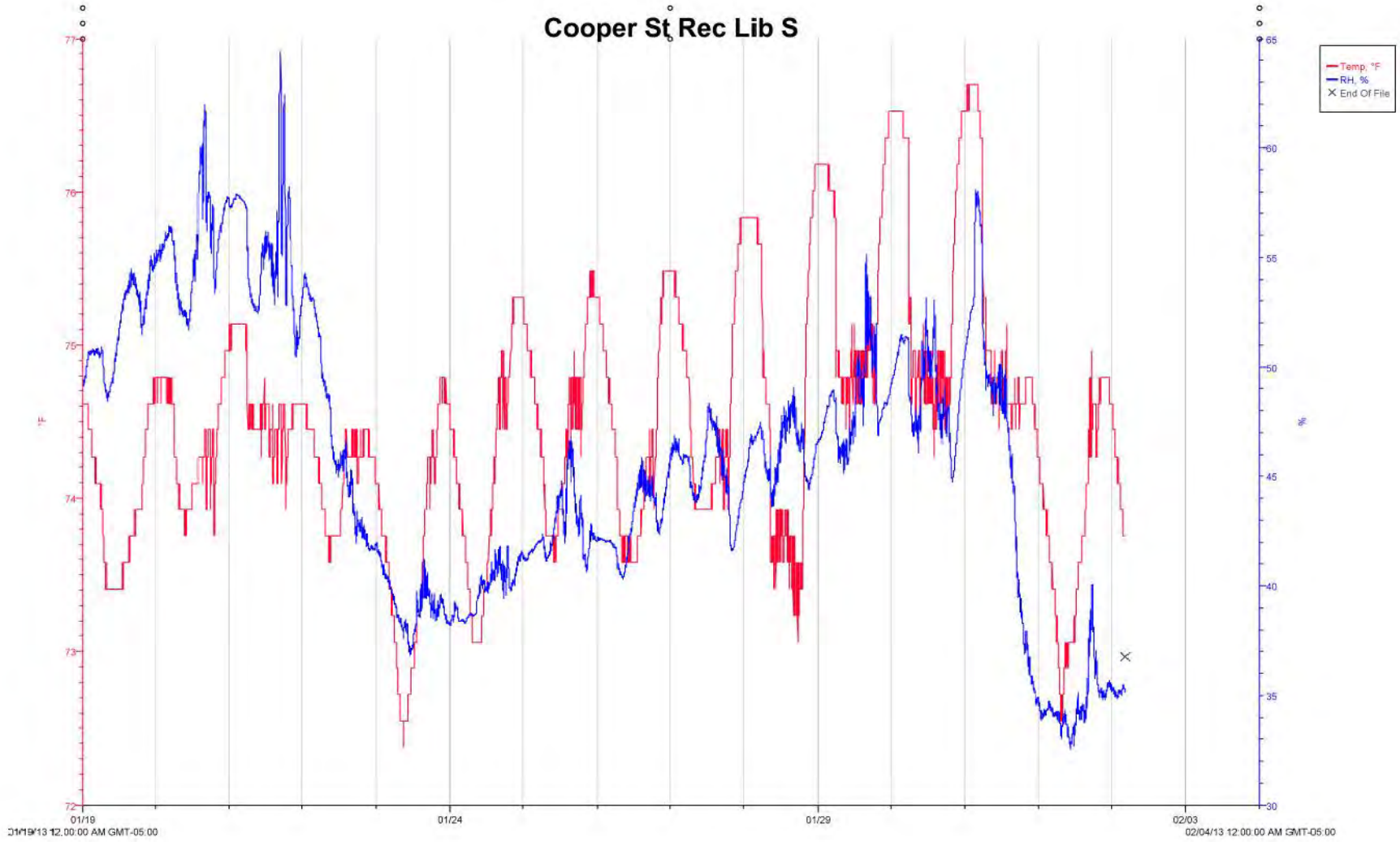
Cooper St Rec Lib S
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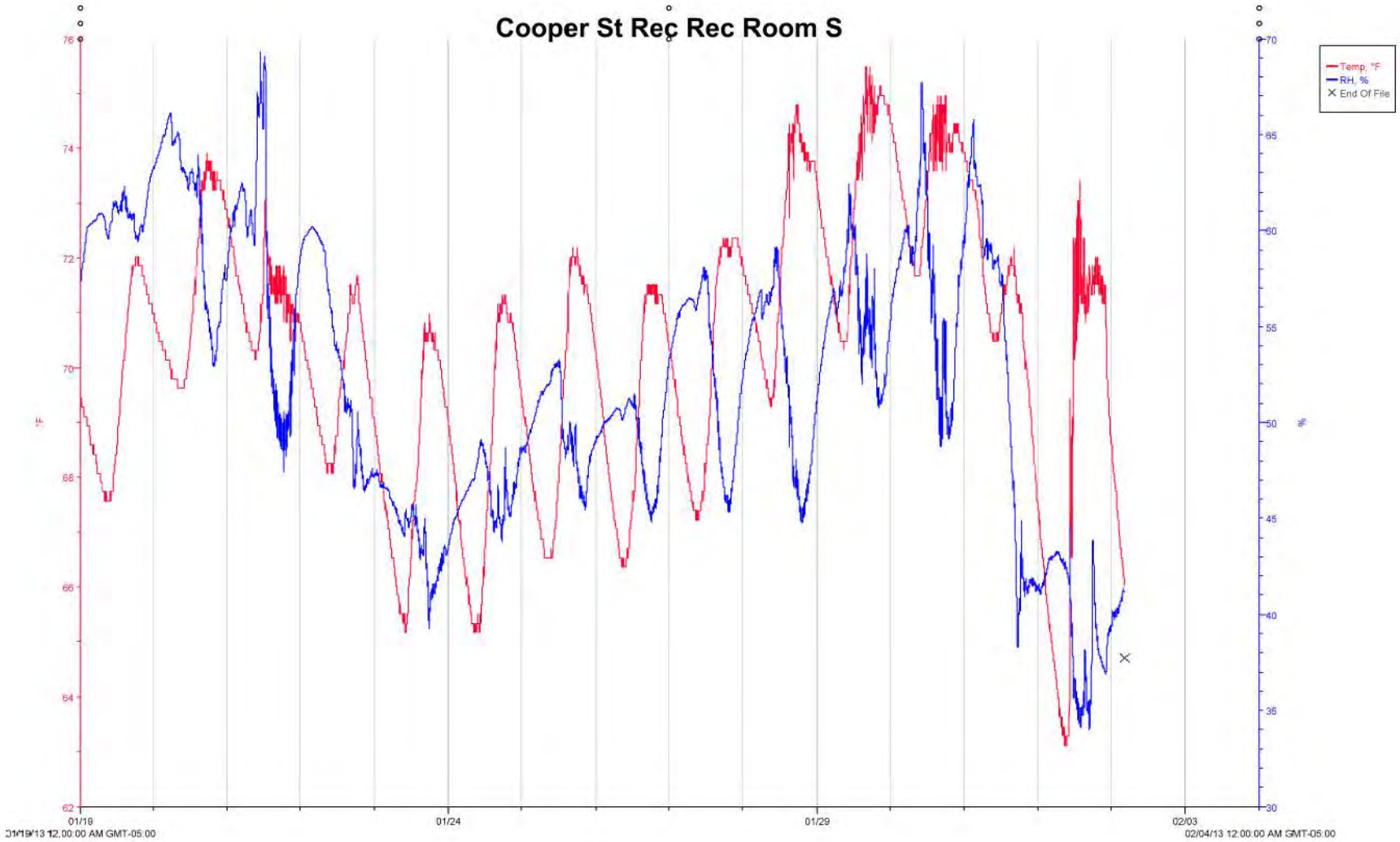
Cooper St Rec Rec Room S
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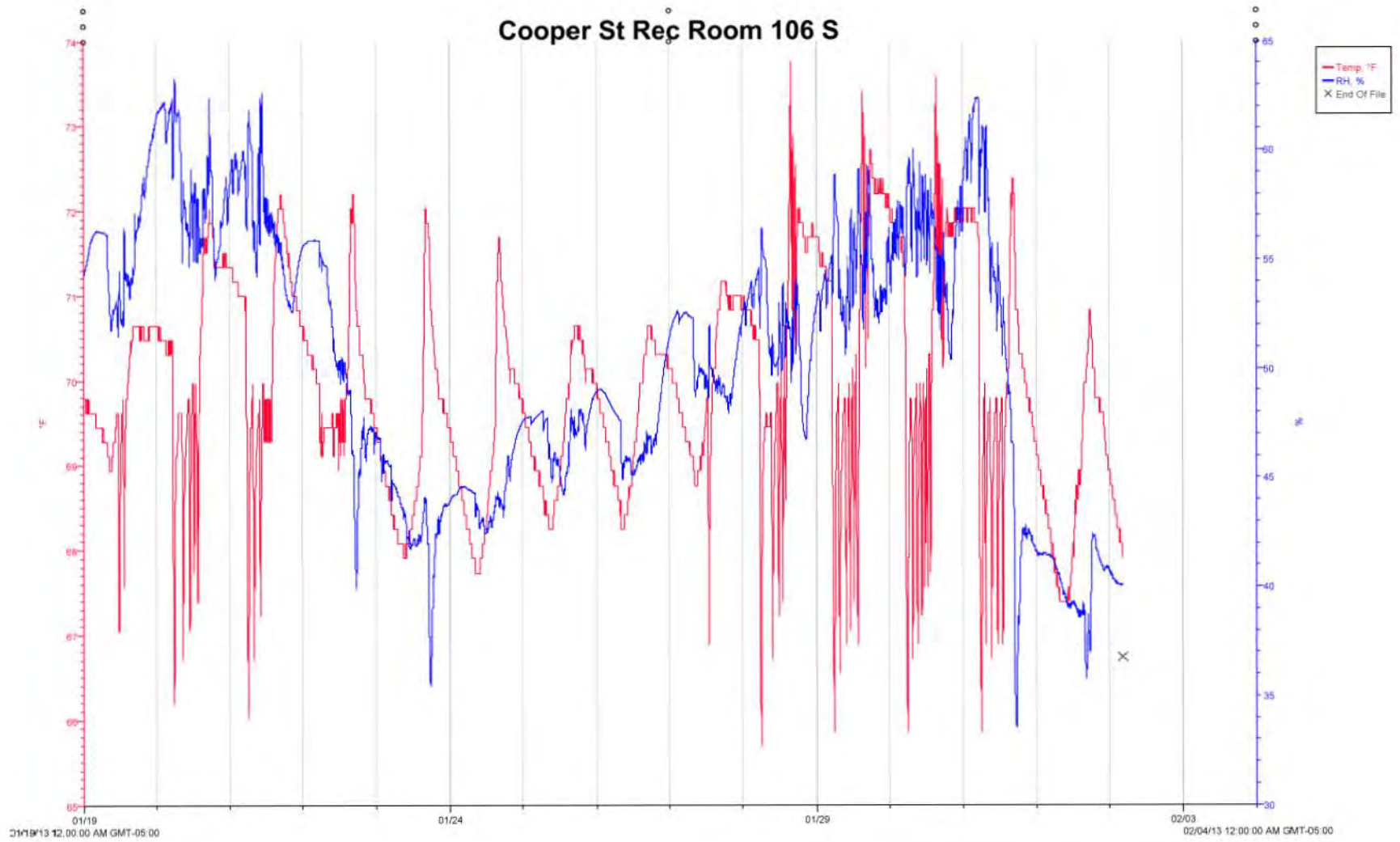
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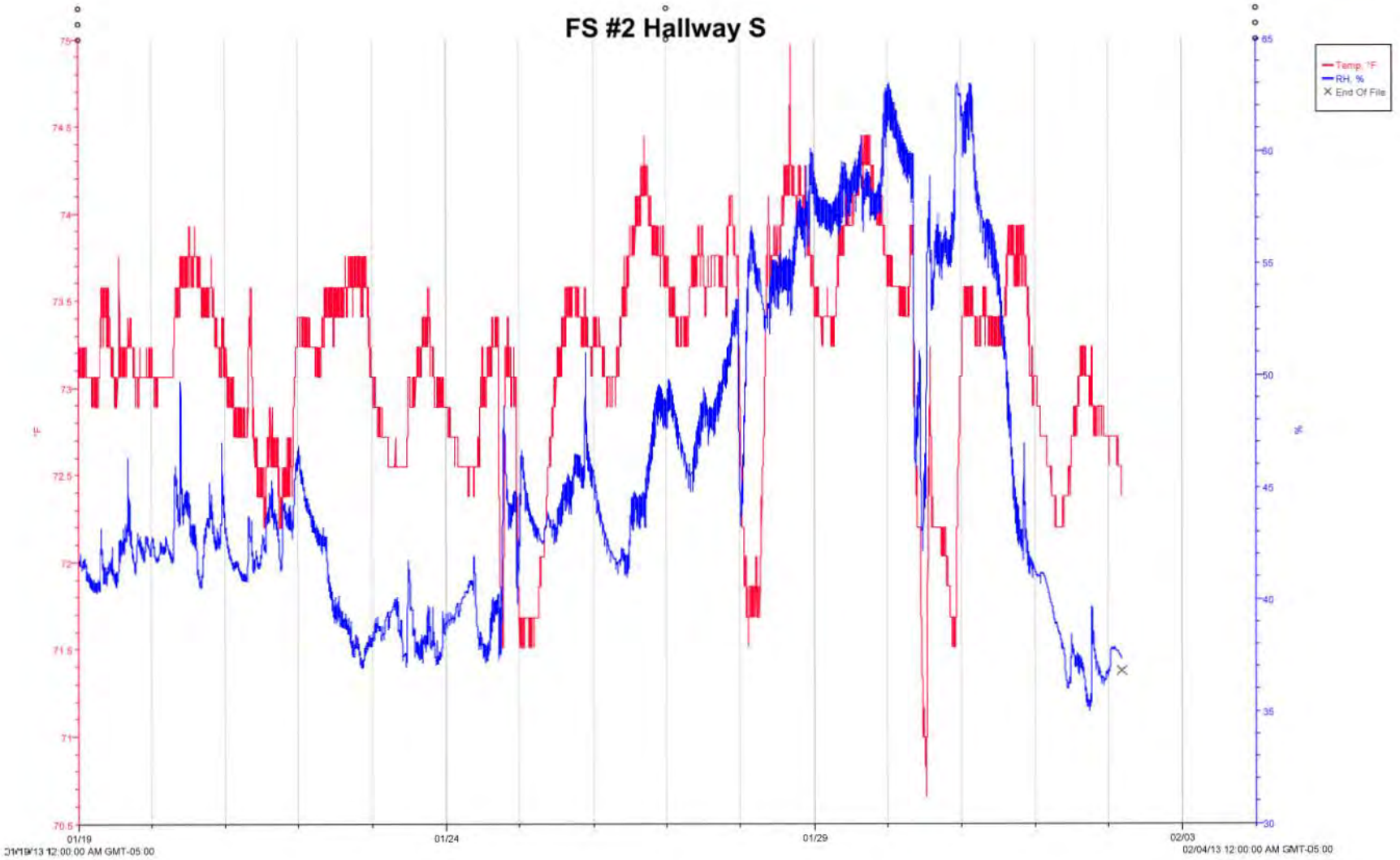
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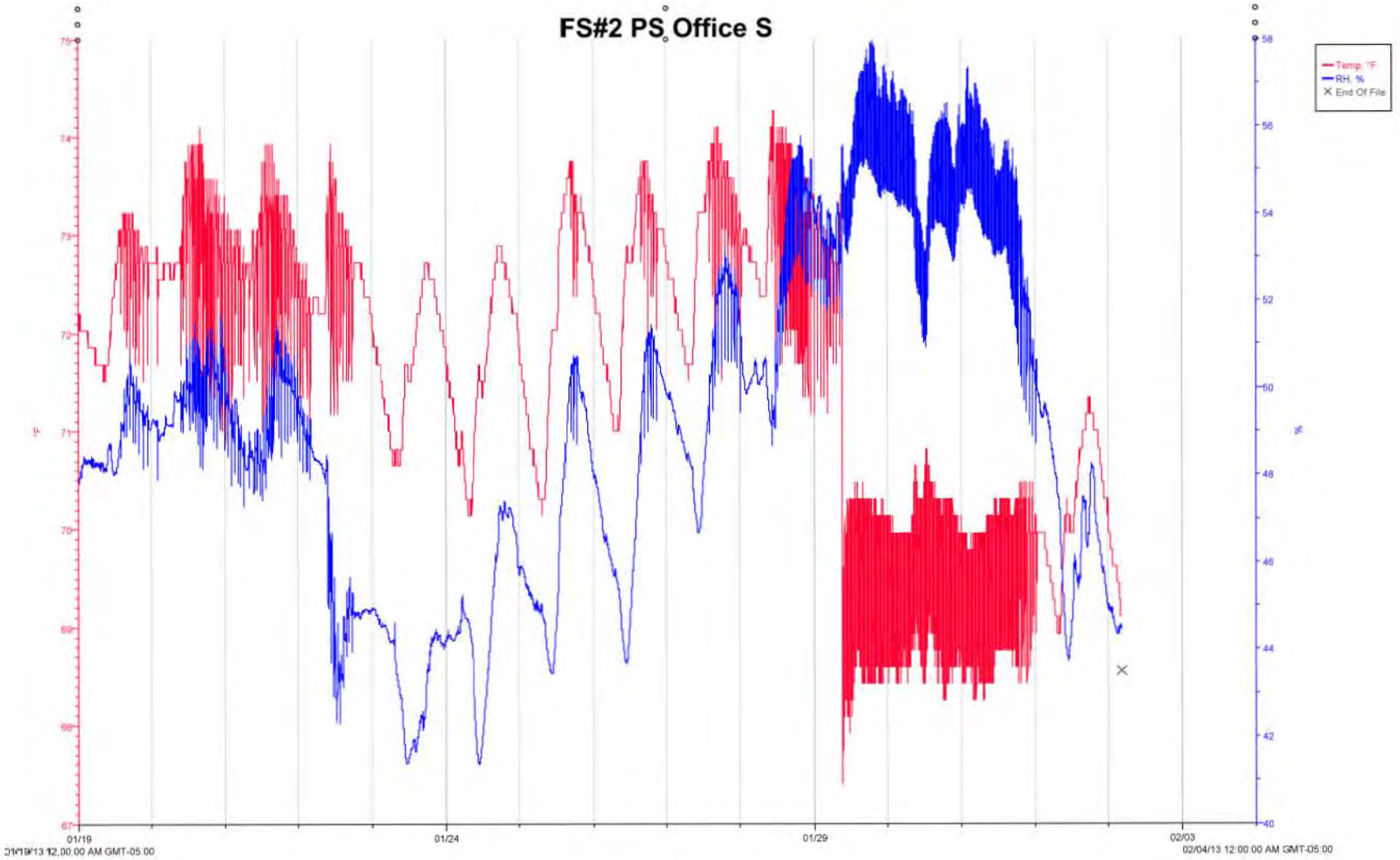
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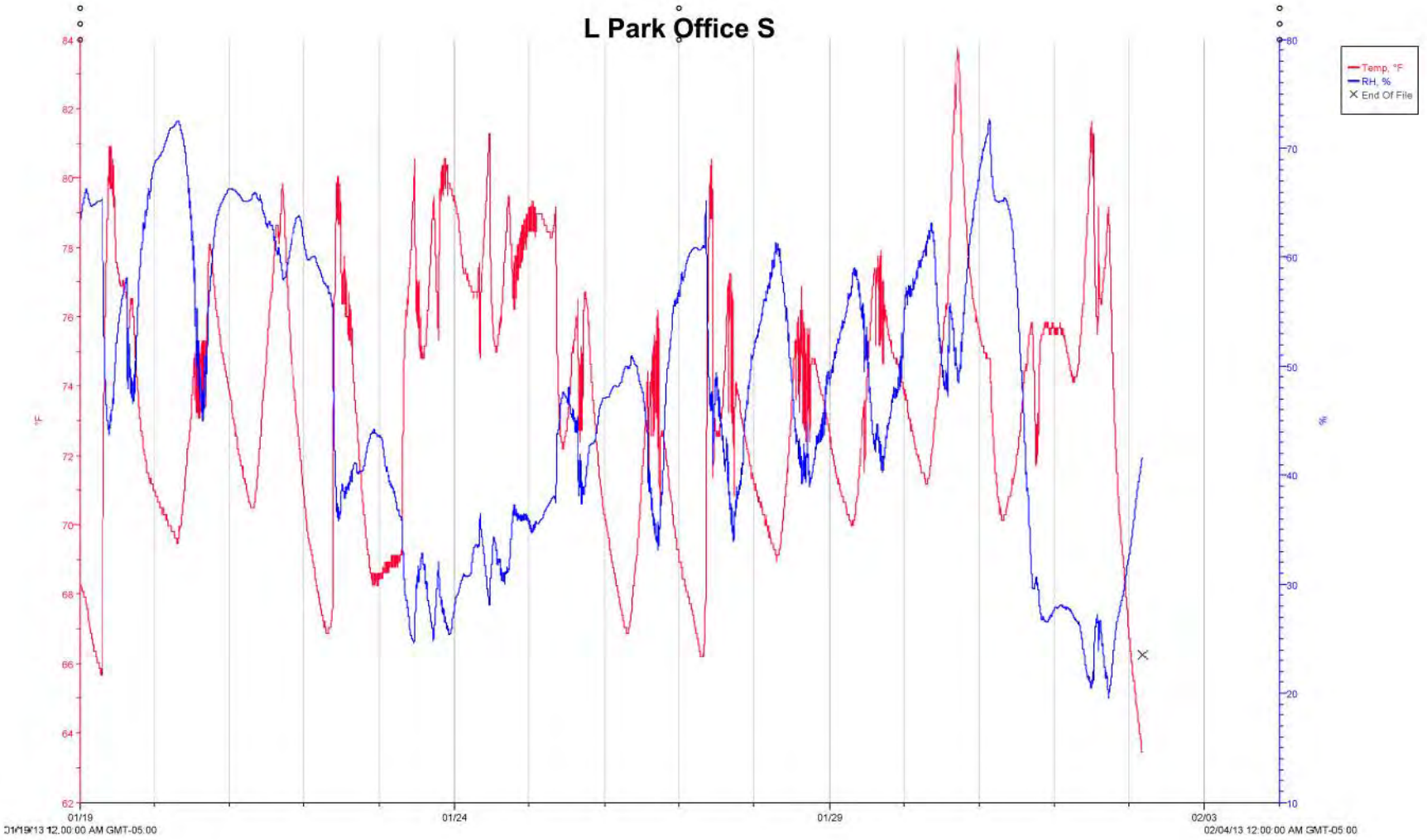
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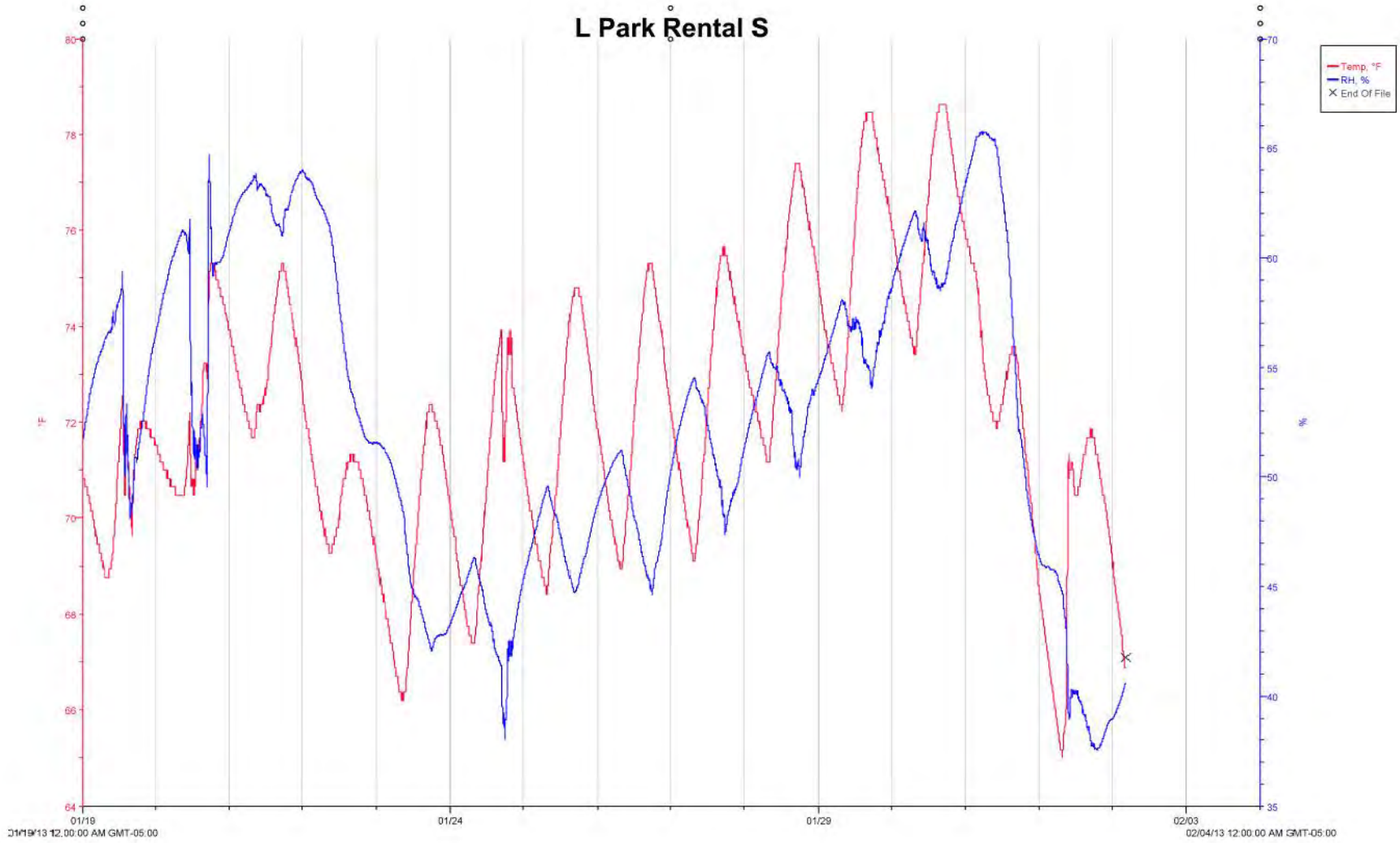
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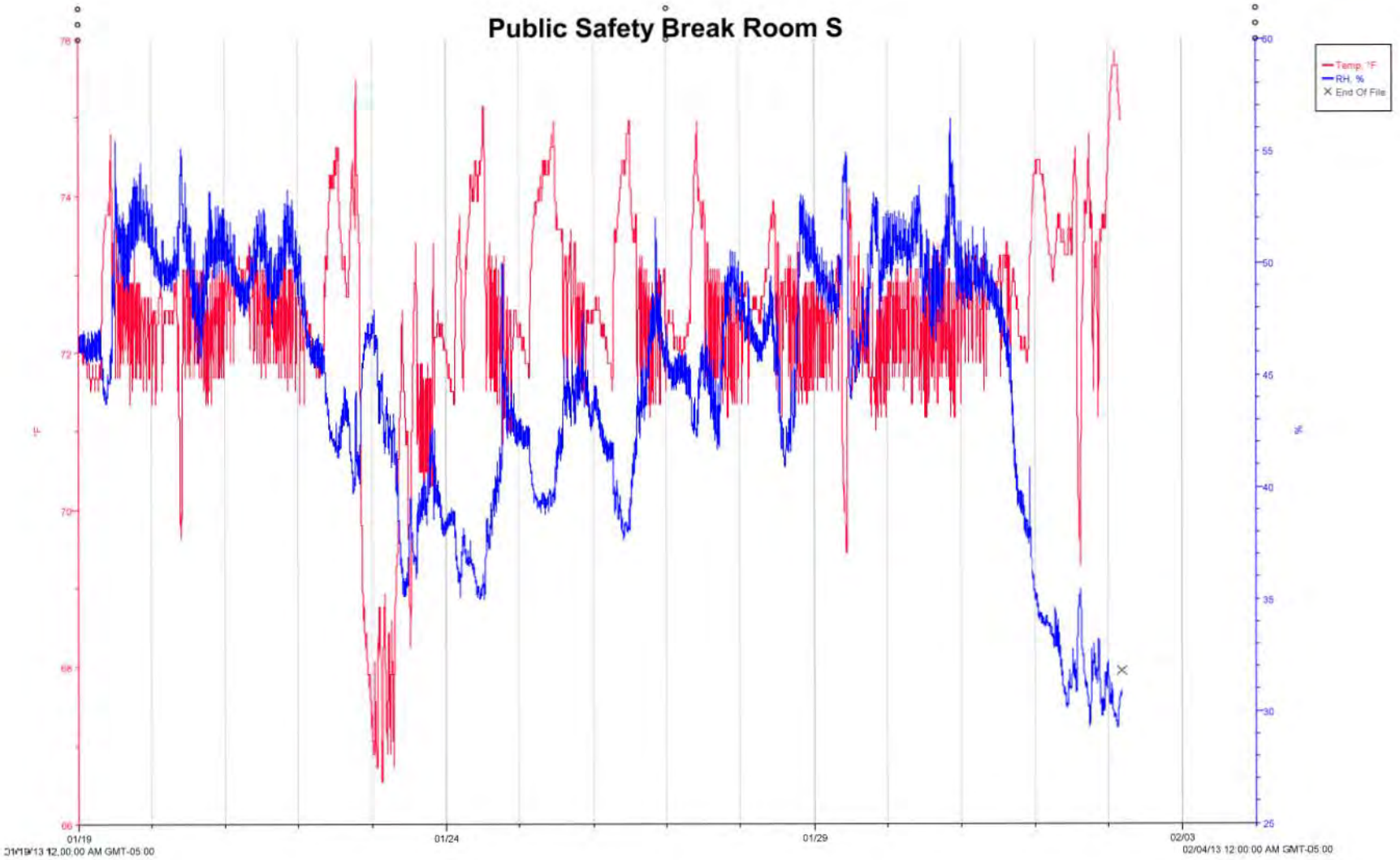
Public Safety Break Room S
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RH, %
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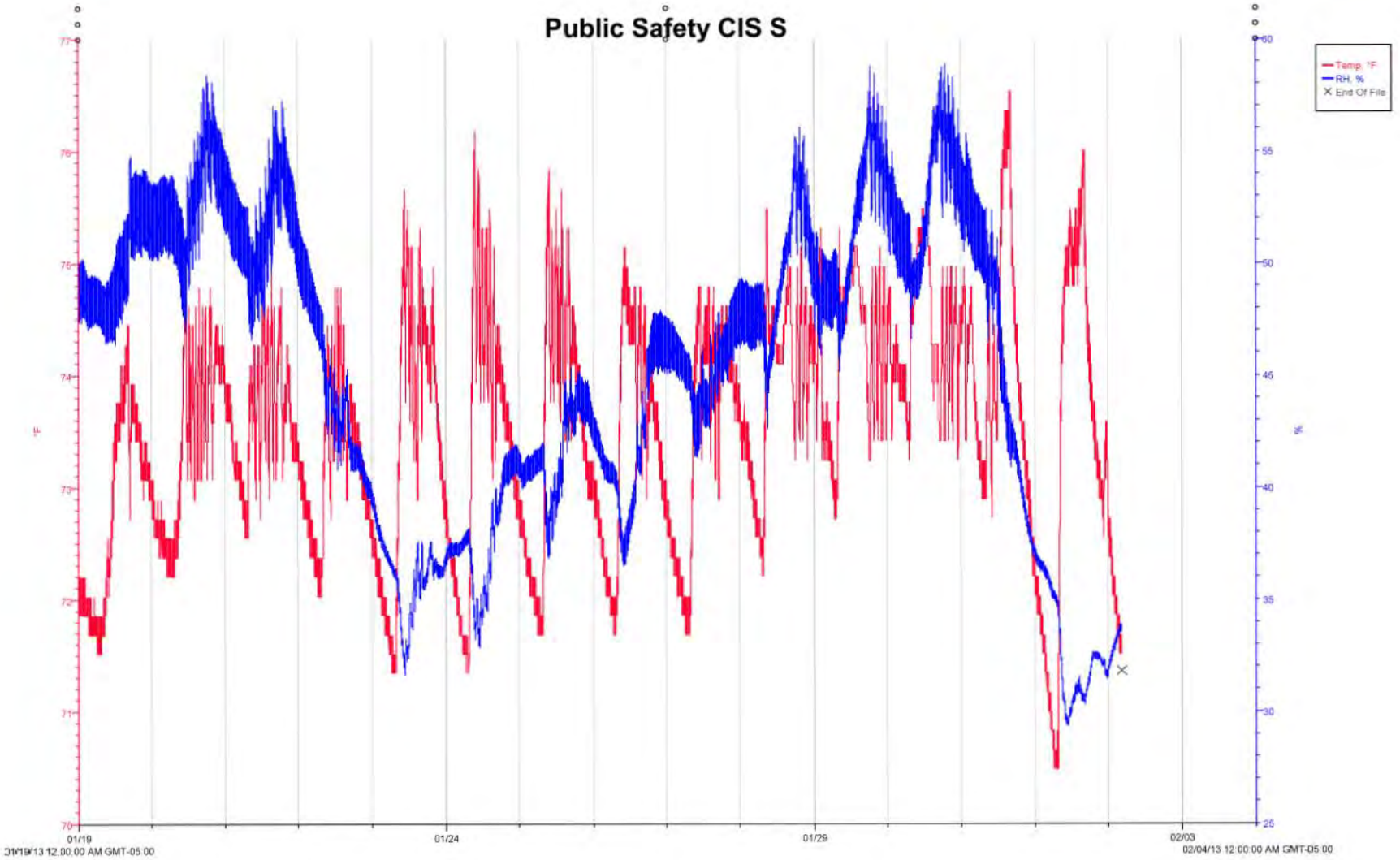
Public Safety CIS S
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RH, %
End Of File
°F
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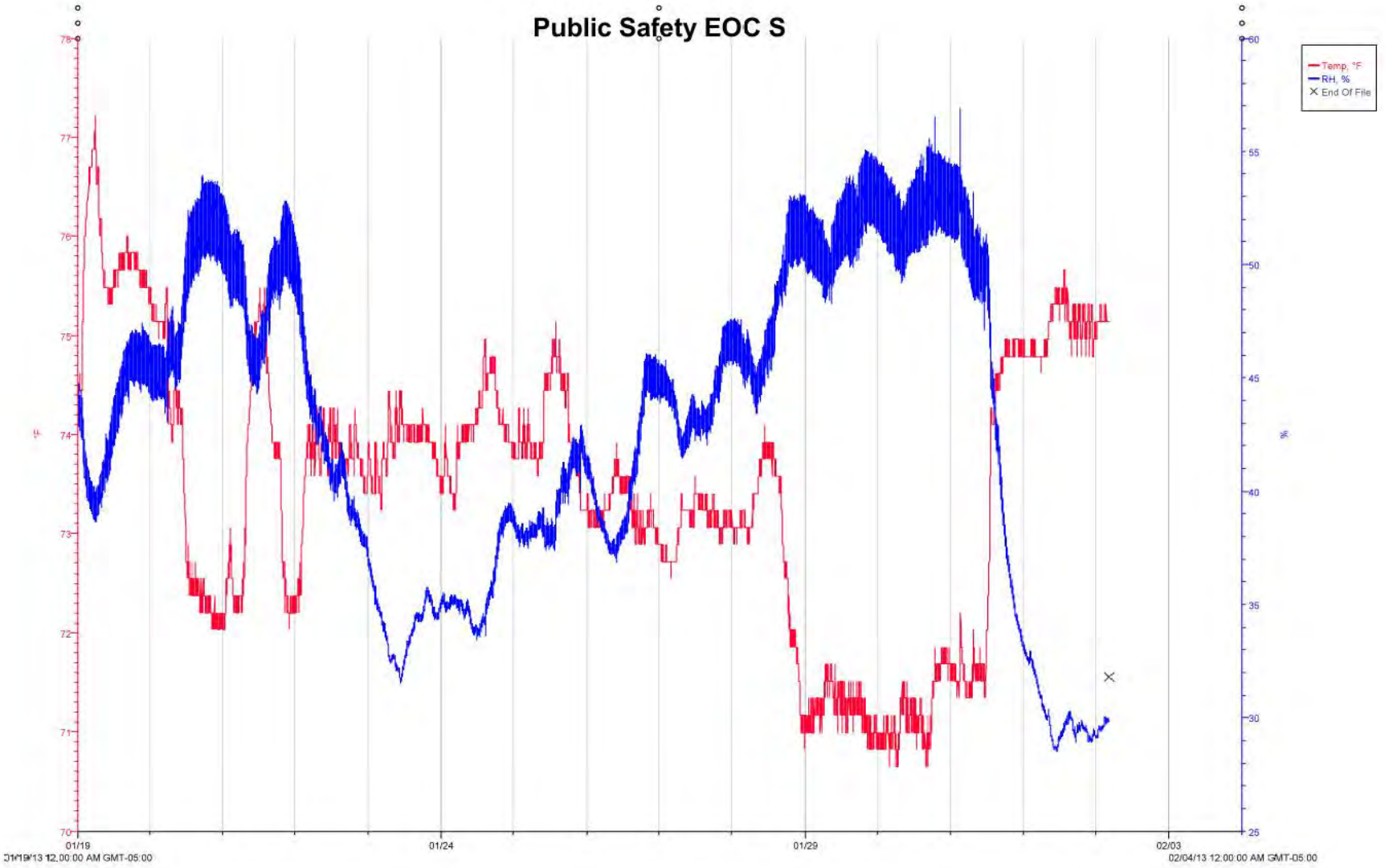
02/04/13 12:00:00 AM GMT-05:00


Public Safety EOC S
Temp, °F
RH, %
End Of File
°F
%
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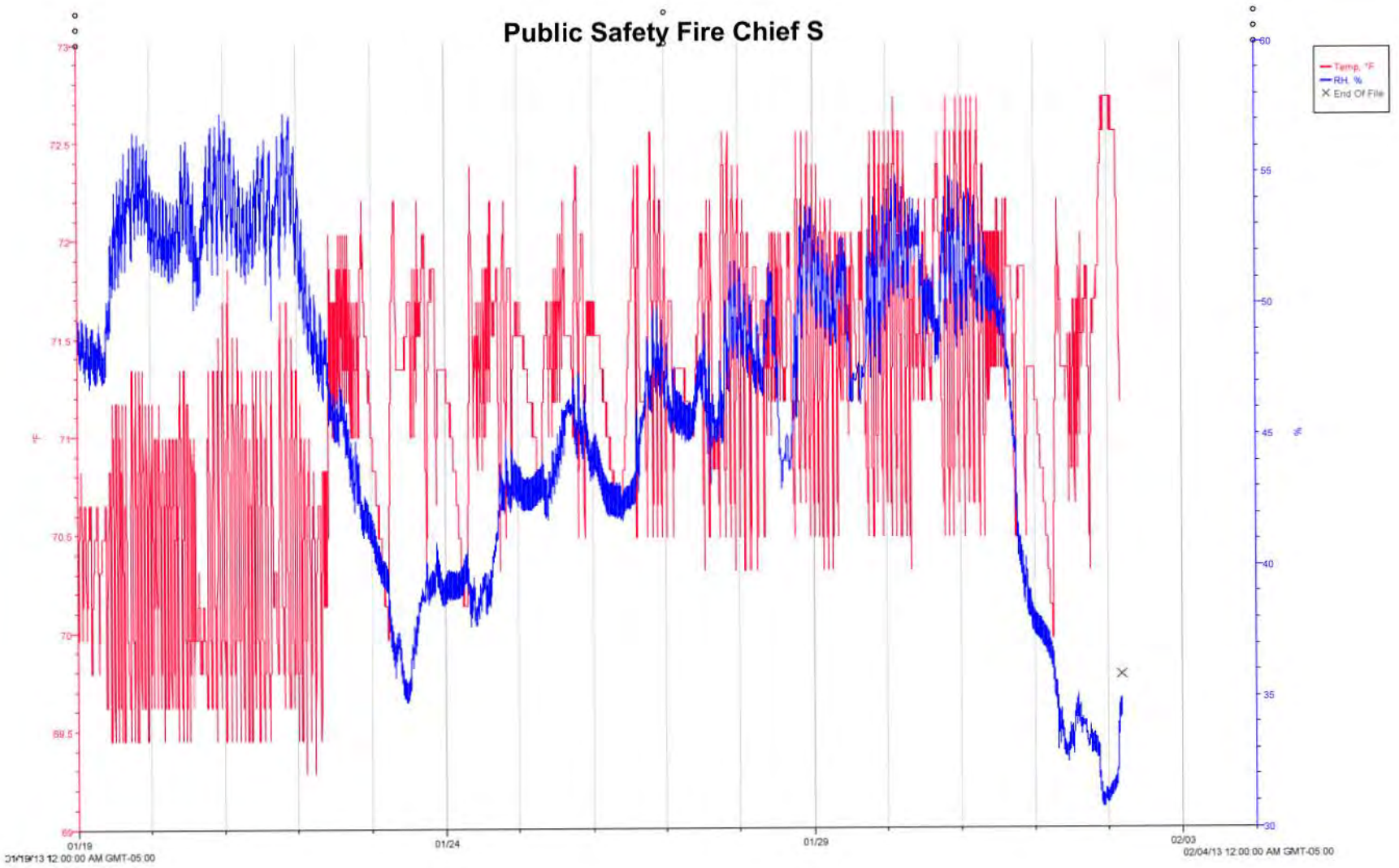
Public Safety Fire Chief S
Temp, °F
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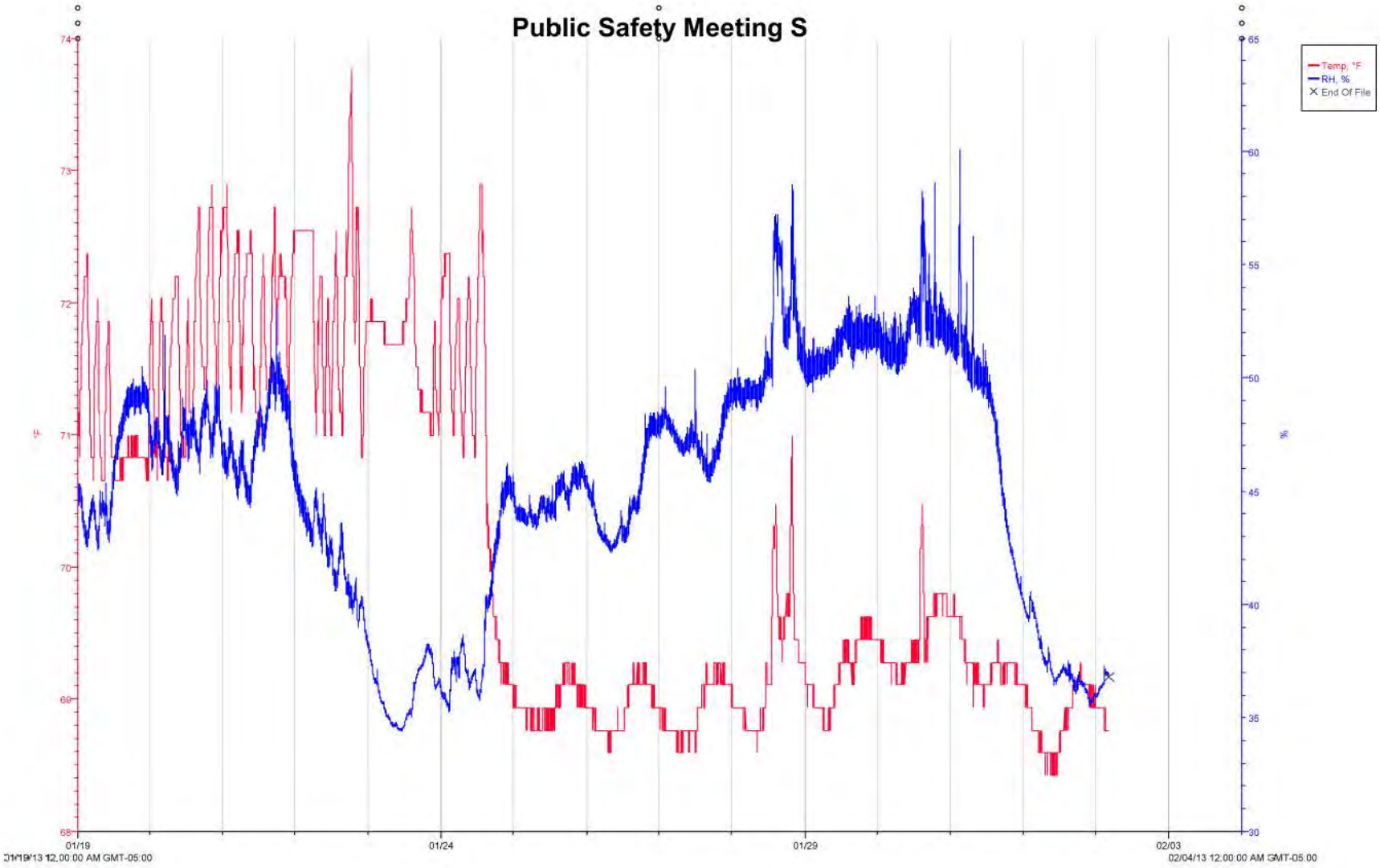
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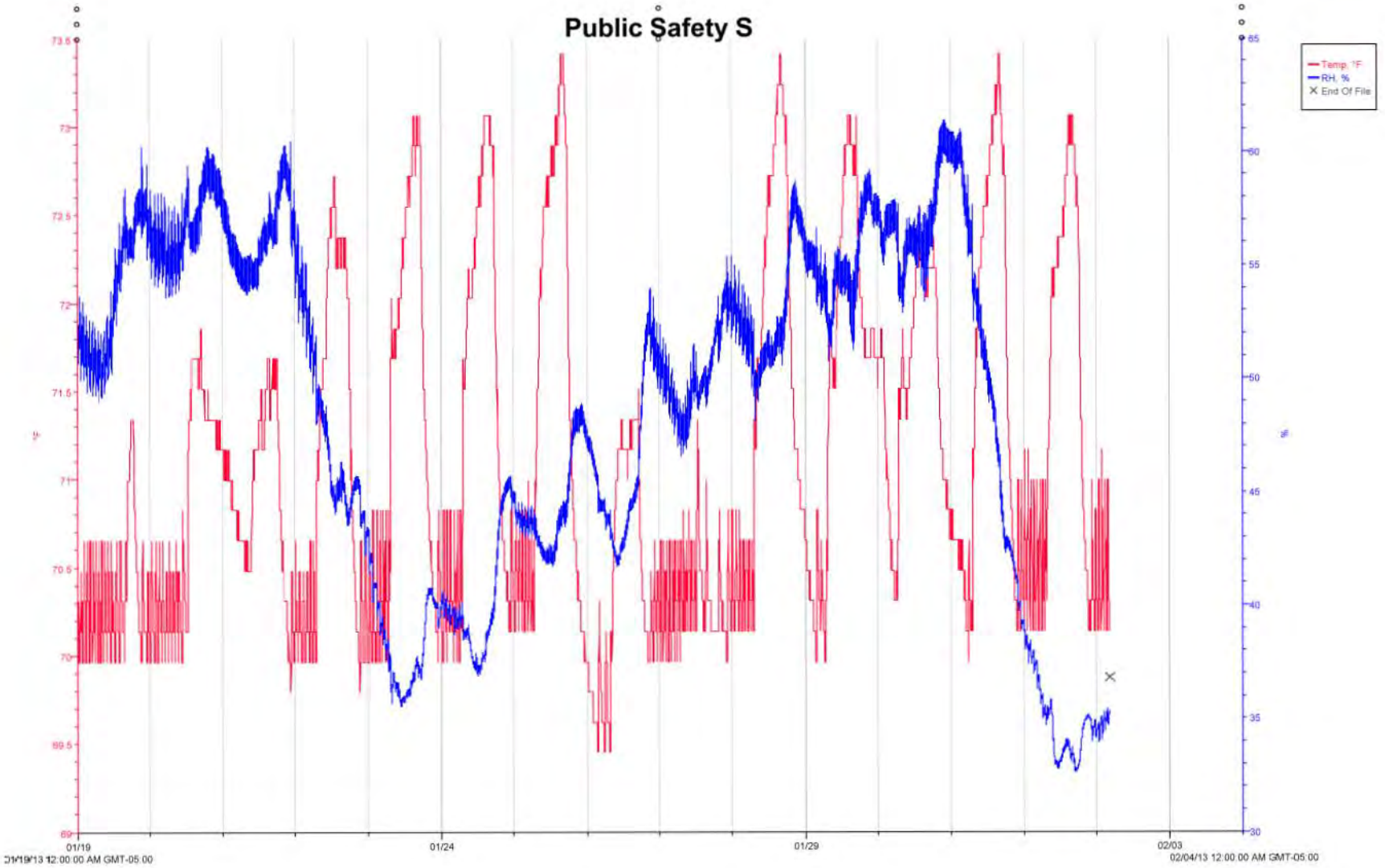
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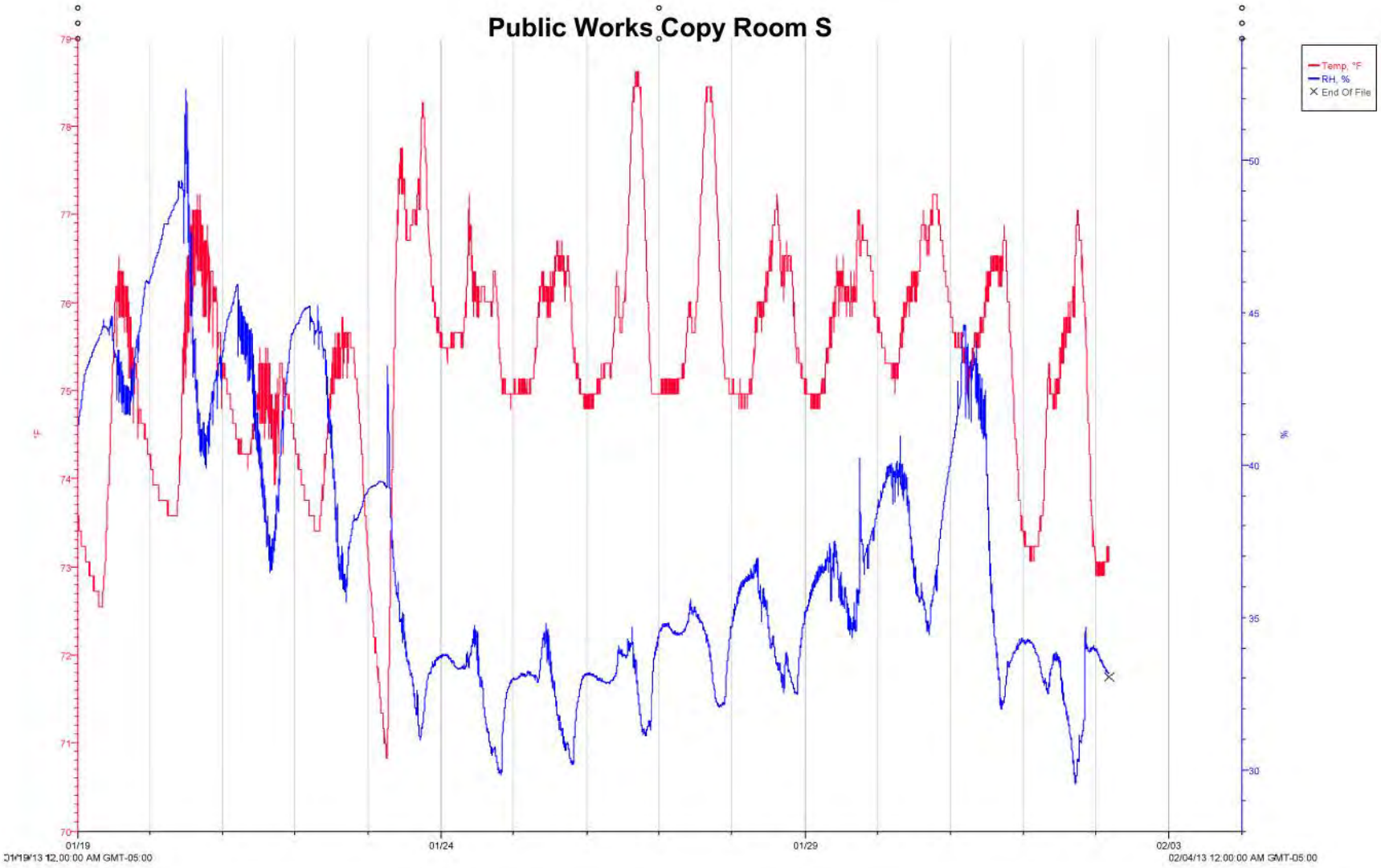
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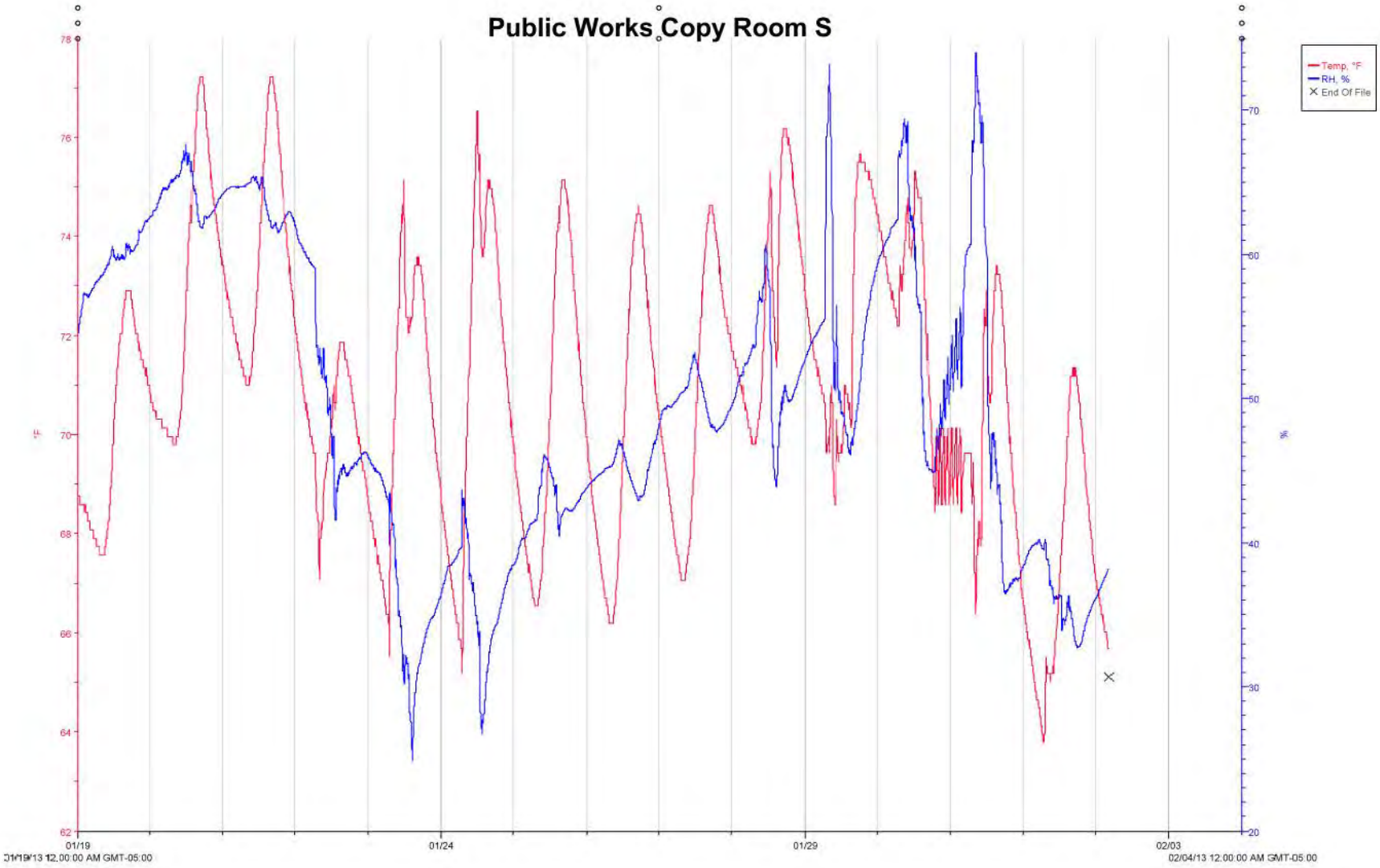
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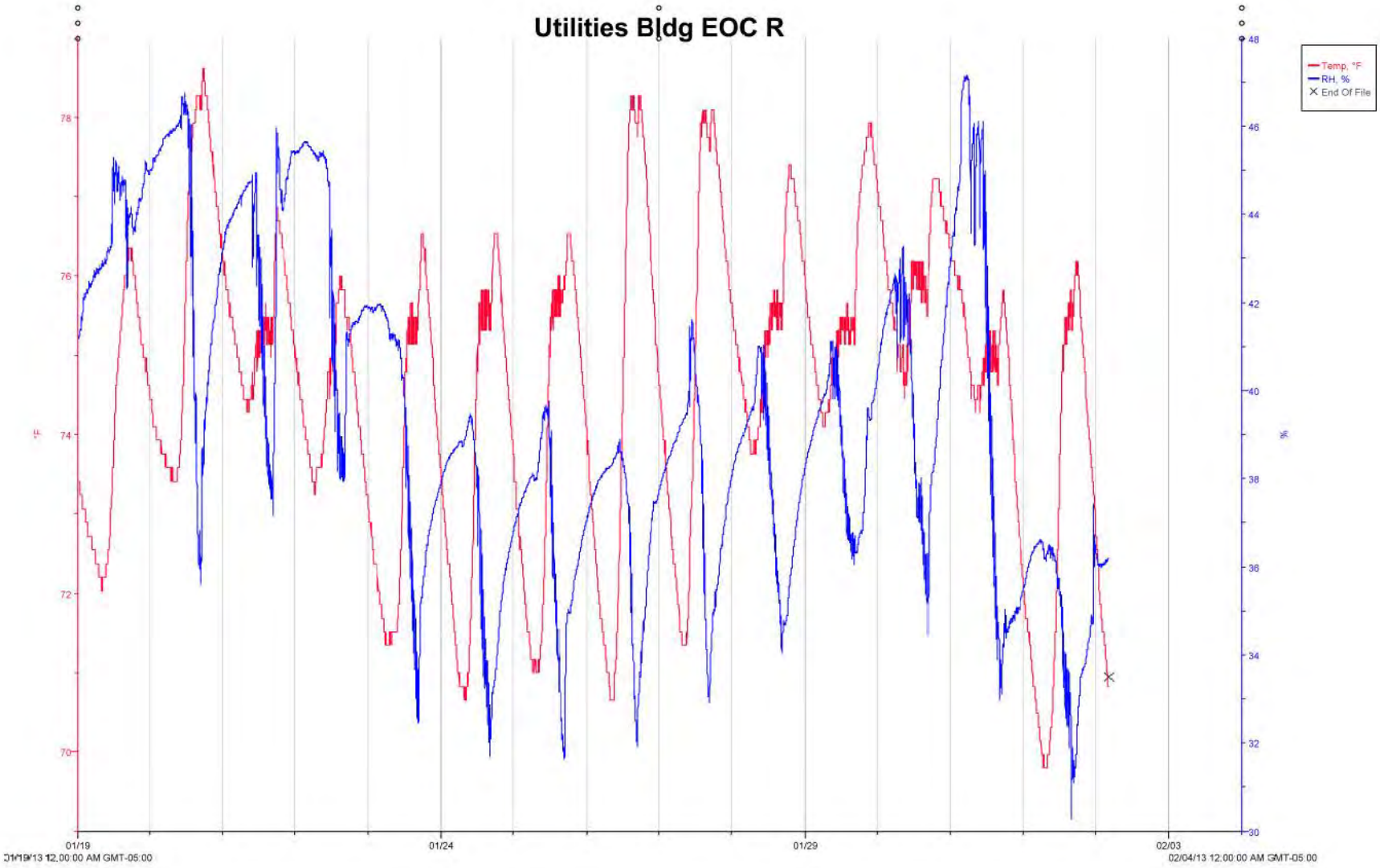
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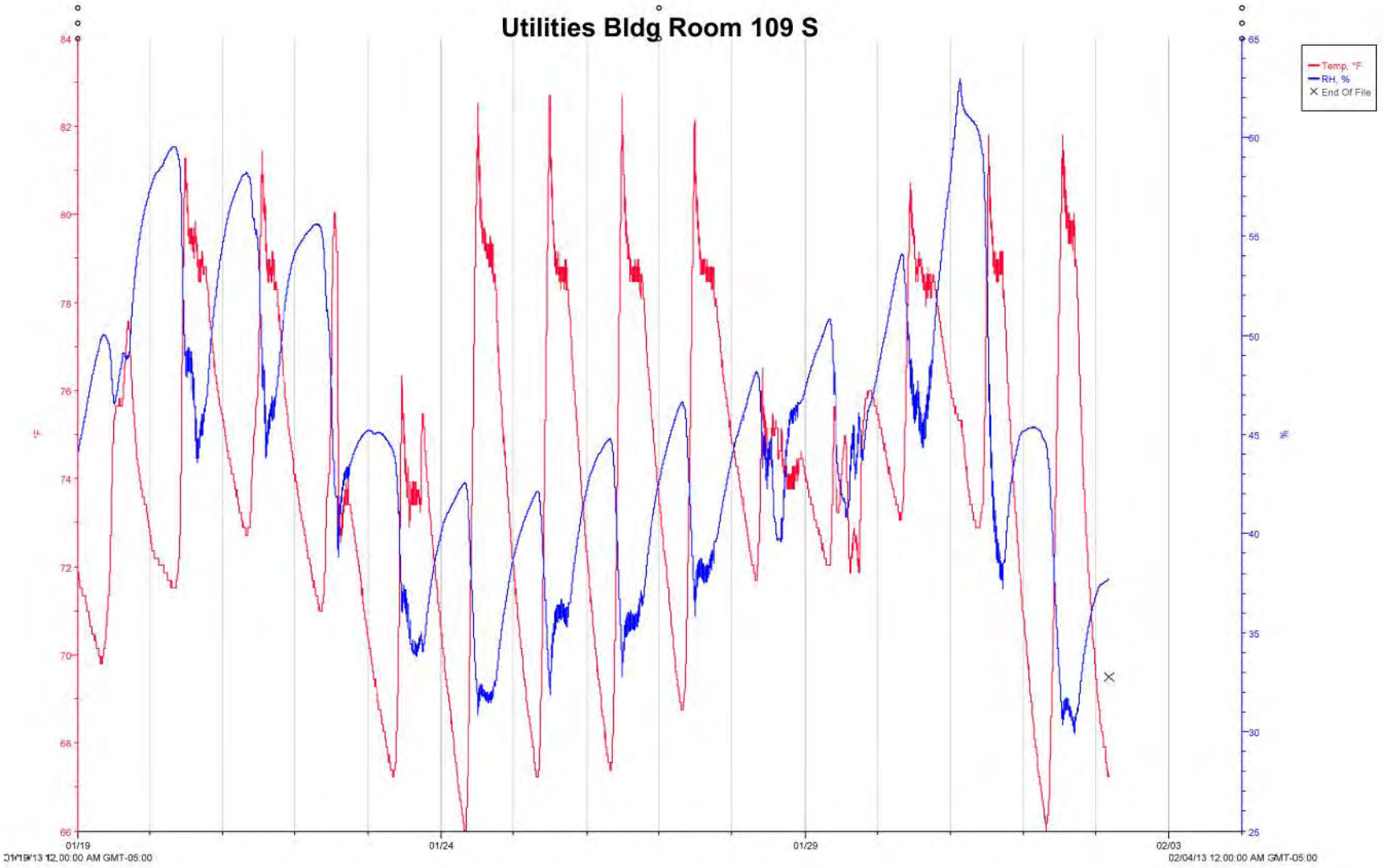
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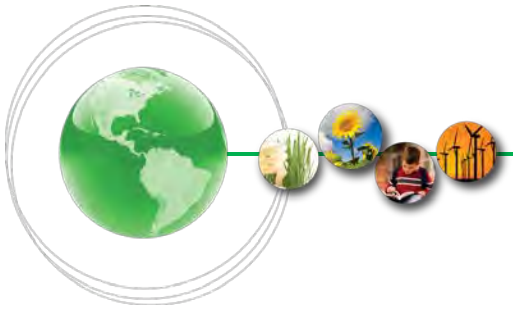
Appendix C – DX Equipment



City of Punta Gorda - DX Equipment Replacement

ECM - City Hall

Existing	
Unit Capacity =	3.5 tons
EER =	10
KW/Ton =	1.200
Elec Cost =	0.11 KWH

Proposed	
Unit Capacity =	3.5 tons
EER =	14
KW/Ton =	0.857

Annual Ton hrs = 10837.93 ton hrs

Annual Elec Cost = $1,430.61

Annual Ton hrs = 10837.93 ton hrs

Annual Elec Cost = $1,021.86

Annual Elec Saving $408.74

Sizing Diversity = 85%
Cooling DD = 3643

Existing	
Unit Capacity =	2.5 tons
EER =	10
KW/Ton =	1.200
Elec Cost =	0.11 KWH

Proposed	
Unit Capacity =	2.5 tons
EER =	16
KW/Ton =	0.750

Annual Ton hrs = 7741.38 ton hrs

Annual Elec Cost = $1,021.86

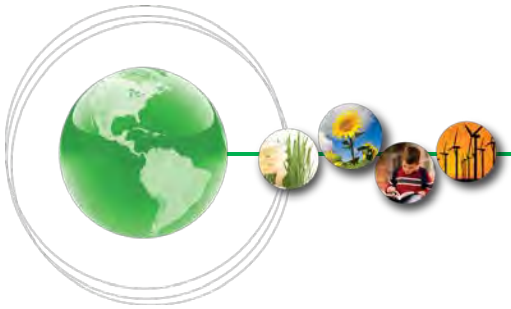
Annual Ton hrs = 7741.38 ton hrs

Annual Elec Cost = $638.66

Annual Elec Saving $383.20

For (3) Units = $1,149.59

Sizing Diversity = 85%
Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - City Hall

Existing	
Unit Capacity =	2 tons
EER =	10
KW/Ton =	1.200
Elec Cost =	0.11 KWH

Proposed	
Unit Capacity =	2 tons
EER =	16
KW/Ton =	0.750

Annual Ton hrs = 6193.10 ton hrs

Annual Ton hrs = 6193.10 ton hrs

Annual Elec Cost =	$817.49

Annual Elec Cost =	$510.93

Annual Elec Saving	$306.56

For (2) Units =	$613.12

Sizing Diversity = 85%

Cooling DD = 3643

Existing	
Unit Capacity =	2 tons
EER =	13
KW/Ton =	0.923
Elec Cost =	0.11 KWH

Proposed	
Unit Capacity =	2 tons
EER =	16
KW/Ton =	0.750

Annual Ton hrs = 6193.10 ton hrs

Annual Ton hrs = 6193.10 ton hrs

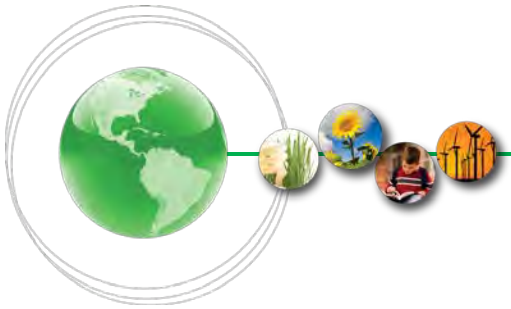
Annual Elec Cost =	$628.84

Annual Elec Cost =	$510.93

Annual Elec Saving	$117.91

Sizing Diversity = 85%

Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - City Hall Annex

Existing	
Unit Capacity =	7.5 tons
EER =	8.3
KW/Ton =	1.446
Elec Cost =	0.09 KWH

Annual Ton hrs = 23224.13 ton hrs

Annual Elec Cost = $3,021.93

Proposed	
Unit Capacity =	7.5 tons
EER =	11.2
KW/Ton =	1.071

Annual Ton hrs = 23224.13 ton hrs

Annual Elec Cost = $2,239.47

Annual Elec Saving $782.47

Sizing Diversity = 85%

Cooling DD = 3643

Existing	
Unit Capacity =	5 tons
EER =	8.5
KW/Ton =	1.412
Elec Cost =	0.09 KWH

Annual Ton hrs = 15482.75 ton hrs

Annual Elec Cost = $1,967.22

Proposed	
Unit Capacity =	5 tons
EER =	14
KW/Ton =	0.857

Annual Ton hrs = 15482.75 ton hrs

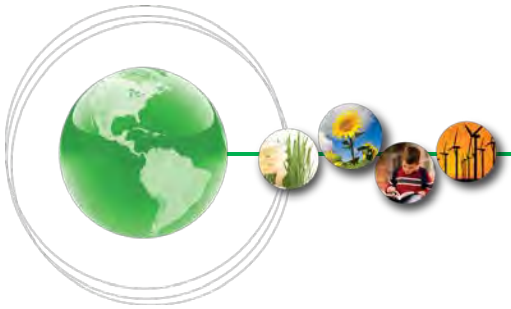
Annual Elec Cost = $1,194.38

Annual Elec Saving $772.84

For (2) Units = $1,545.67

Sizing Diversity = 85%

Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - City Hall Annex

Existing	
Unit Capacity =	5 tons
EER =	11
KW/Ton =	1.091
Elec Cost =	0.09 KWH

Proposed	
Unit Capacity =	5 tons
EER =	14
KW/Ton =	0.857

Annual Ton hrs = 15482.75 ton hrs

Annual Elec Cost = $1,520.12

Annual Ton hrs = 15482.75 ton hrs

Annual Elec Cost = $1,194.38

Annual Elec Saving $325.74

Sizing Diversity = 85%

Cooling DD = 3643

Existing	
Unit Capacity =	4 tons
EER =	8.5
KW/Ton =	1.412
Elec Cost =	0.09 KWH

Proposed	
Unit Capacity =	4 tons
EER =	14
KW/Ton =	0.857

Annual Ton hrs = 12386.20 ton hrs

Annual Elec Cost = $1,573.78

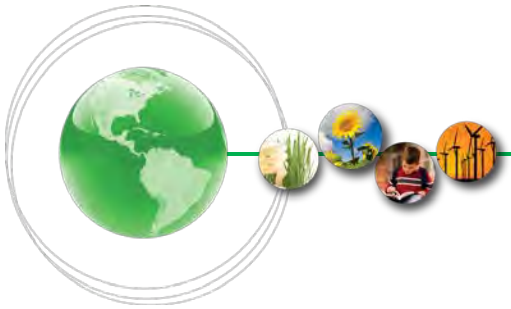
Annual Ton hrs = 12386.2 ton hrs

Annual Elec Cost = $955.51

Annual Elec Saving $618.27

Sizing Diversity = 85%

Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - City Hall Annex

Existing	
Unit Capacity =	3.5 tons
EER =	8.5
KW/Ton =	1.412
Elec Cost =	0.09 KWH

Proposed	
Unit Capacity =	3.5 tons
EER =	14
KW/Ton =	0.857

Annual Ton hrs = 10837.93 ton hrs

Annual Ton hrs = 10837.93 ton hrs

Annual Elec Cost =	$1,377.05

Annual Elec Cost =	$836.07

Annual Elec Saving	$540.99

Sizing Diversity = 85%

Cooling DD = 3643

Existing	
Unit Capacity =	3 tons
EER =	10
KW/Ton =	1.200
Elec Cost =	0.09 KWH

Proposed	
Unit Capacity =	3 tons
EER =	16
KW/Ton =	0.750

Annual Ton hrs = 9289.65 ton hrs

Annual Ton hrs = 9289.65 ton hrs

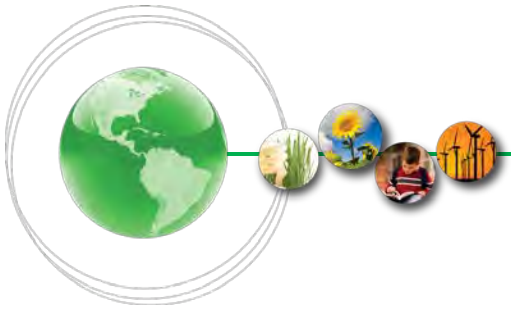
Annual Elec Cost =	$1,003.28

Annual Elec Cost =	$627.05

Annual Elec Saving	$376.23

Sizing Diversity = 85%

Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - City Hall Annex

Existing	
Unit Capacity =	2.5 tons
EER =	10
KW/Ton =	1.200
Elec Cost =	0.09 KWH

Proposed	
Unit Capacity =	2.5 tons
EER =	16
KW/Ton =	0.750

Annual Ton hrs = 7741.38 ton hrs

Annual Elec Cost = $836.07

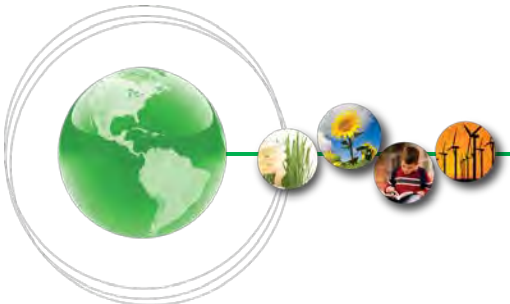
Annual Ton hrs = 7741.375 ton hrs

Annual Elec Cost = $522.54

Annual Elec Saving $313.53

Sizing Diversity = 85%

Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - Fire Station 3

Existing	
Unit Capacity =	1.5 tons
EER =	10
KW/Ton =	1.200
Elec Cost =	0.10 KWH

Annual Ton hrs = 4644.83 ton hrs

Annual Elec Cost =	$557.38

Proposed	
Unit Capacity =	1.5 tons
EER =	16
KW/Ton =	0.750

Annual Ton hrs = 4644.83 ton hrs

Annual Elec Cost =	$348.36

Annual Elec Saving	$209.02

Sizing Diversity = 85%
Cooling DD = 3643

Existing	
Unit Capacity =	3.5 tons
EER =	10
KW/Ton =	1.200
Elec Cost =	0.10 KWH

Annual Ton hrs = 10837.93 ton hrs

Annual Elec Cost =	$1,300.55

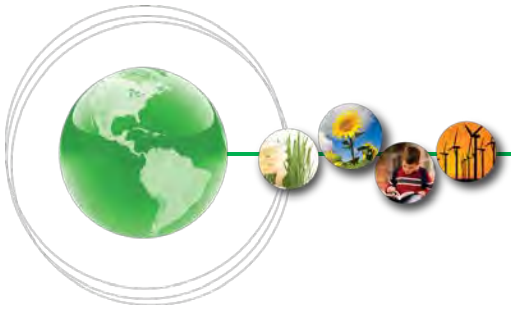
Proposed	
Unit Capacity =	3.5 tons
EER =	16
KW/Ton =	0.750

Annual Ton hrs = 10837.93 ton hrs

Annual Elec Cost =	$812.84

Annual Elec Saving	$487.71

Sizing Diversity = 85%
Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - Public Safety

Existing	
Unit Capacity =	15 tons
EER =	9.9
KW/Ton =	1.212
Elec Cost =	0.08 KWH

Proposed	
Unit Capacity =	15 tons
EER =	11
KW/Ton =	1.091

Annual Ton hrs = 46448.25 ton hrs

Annual Elec Cost = $4,504.07

Annual Ton hrs = 46448.25 ton hrs

Annual Elec Cost = $4,053.67

Annual Elec Saving $450.41

Sizing Diversity = 85%

Cooling DD = 3643

Existing	
Unit Capacity =	12.5 tons
EER =	9.9
KW/Ton =	1.212
Elec Cost =	0.08 KWH

Proposed	
Unit Capacity =	12.5 tons
EER =	11
KW/Ton =	1.091

Annual Ton hrs = 38706.88 ton hrs

Annual Elec Cost = $3,753.39

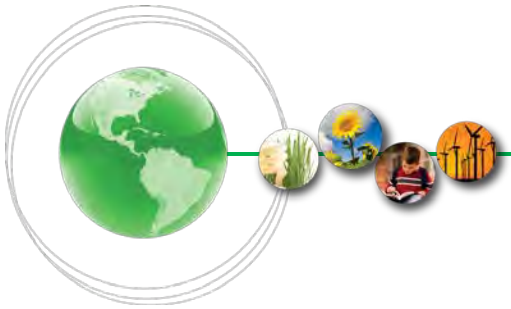
Annual Ton hrs = 38706.88 ton hrs

Annual Elec Cost = $3,378.05

Annual Elec Saving $375.34

Sizing Diversity = 85%

Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - Public Safety

Existing	
Unit Capacity =	10 tons
EER =	9.9
KW/Ton =	1.212
Elec Cost =	0.08 KWH

Annual Ton hrs = 30965.50 ton hrs

Annual Elec Cost = $3,002.72

Proposed	
Unit Capacity =	10 tons
EER =	11.2
KW/Ton =	1.071

Annual Ton hrs = 30965.5 ton hrs

Annual Elec Cost = $2,654.19

Annual Elec Saving $348.53

Sizing Diversity = 85%
Cooling DD = 3643

Existing	
Unit Capacity =	5 tons
EER =	13
KW/Ton =	0.923
Elec Cost =	0.08 KWH

Annual Ton hrs = 15482.75 ton hrs

Annual Elec Cost = $1,143.34

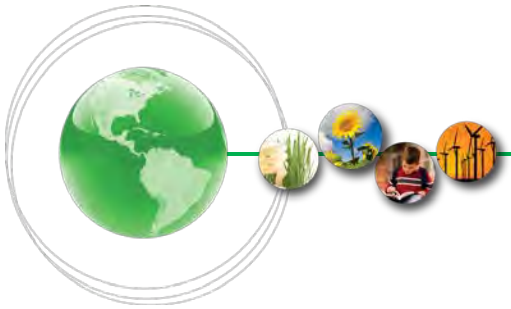
Proposed	
Unit Capacity =	5 tons
EER =	14
KW/Ton =	0.857

Annual Ton hrs = 15482.75 ton hrs

Annual Elec Cost = $1,061.67

Annual Elec Saving $81.67

Sizing Diversity = 85%
Cooling DD = 3643



City of Punta Gorda - DX Equipment Replacement

ECM - Public Safety

Existing	
Unit Capacity =	3.5 tons
EER =	10
KW/Ton =	1.200
Elec Cost =	0.08 KWH

Proposed	
Unit Capacity =	3.5 tons
EER =	14
KW/Ton =	0.857

Annual Ton hrs = 10837.93 ton hrs

Annual Elec Cost = $1,040.44

Annual Ton hrs = 10837.93 ton hrs

Annual Elec Cost = $743.17

Annual Elec Saving $297.27

Sizing Diversity = 85%
Cooling DD = 3643

Existing	
Unit Capacity =	1 tons
EER =	8.5
KW/Ton =	1.412
Elec Cost =	0.08 KWH

Proposed	
Unit Capacity =	1 tons
EER =	16
KW/Ton =	0.750

Annual Ton hrs = 3096.55 ton hrs

Annual Elec Cost = $349.73

Annual Ton hrs = 3096.55 ton hrs

Annual Elec Cost = $185.79

Annual Elec Saving $163.94

Sizing Diversity = 85%
Cooling DD = 3643

Mechanical Savings

Facility	Total kWh	kWh Saved	$$$ Saved
City Hall	91948	20,260	$ 2,289.36
City Hall Annex	306540	51,757	$ 4,502.89
Fire Station 3	79651	6,764	$ 696.72
Public Safety	619920	22,301	$ 1,717.15

40MVC012 with 38MVC012
Comfort™ Series High Wall Duct–Free Split System
Cooling Only with Puron® Refrigerant

Carrier®
Turn to the Experts.℠

Submittal Data

Job Data:_____ Location:_____

Buyer:_____ Buyer P.O.#_____ Carrier # _____

Unit Number:_____ Model Number: _____

Performance Data Certified By: _____ Date: _____

eez
Worry-FREE. Hassle-FREE. Duct-FREE.™

Puron
the environmentally sound refrigerant

FEATURES

- 13 SEER
- Wireless remote standard
- Low voltage controls
- 35 VDC indoor fan motor
- User selectable fan speeds (auto, low med., high)
- Indoor unit is powered from the outdoor unit
- Auto restart
- Diagnostics
- Dehumidification mode
- Turbo Mode
- Sleep mode
- Auto swing
- Timer
- Cleanable filters
- Low ambient operation to -20°F (-28.9°C) with accessories

Indoor Unit - 40MVC / Outdoor Unit - 38MVC
(Unless otherwise indicated, data applies to both indoor and outdoor models)

SYSTEM SIZE 012
REFRIGERANT R-410A
PERFORMANCE
Nominal Capacity 12,000
SEER 13
Airflow (Low/Med/High) . . . . . 340 / 365 / 425
Performance at actual conditions: Attached ☐ Not Attached ☐
SOUND PRESSURE dBA
Indoor (Low/Med/High) . . . . . 40 / 42 / 47
Outdoor 54
SOUND POWER dBA
Indoor (Low/Med/High) . . . . . 51 / 53 / 58
Outdoor 65

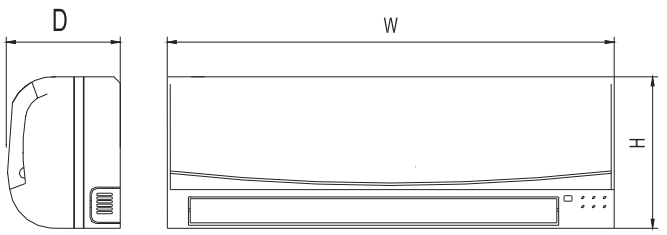
ELECTRICAL
System Voltage . . . . . 38/40MVC012---1 = 115-1-60 V
. . . . . 38/40MVC012---3 = 208/230-1-60 V
MCA (outdoor) . . . . . 115V = 15
. . . . . 208/230V = 9
MOCP (outdoor) . . . . . 115V = 25
. . . . . 208/230V = 15
Fan Motor (Indoor) (FLA) 1.18
Motor Watts 25
CONTROLS
Control Remote . . . . . Wireless
Control Voltage . . . . . Low Voltage
Interconnecting (indoor to outdoor) Wiring (0-50 ft.) . . . . . 18 AWG
Interconnecting (indoor to outdoor) Wiring (50-65 ft.) . . . . . 16 AWG
REFRIGERANT LINES (Insulate both lines)
Mixed Phase Line (in.) OD 1/4
Vapor Line (in.) OD 1/2
Metering/Control Device . . . . . Capillary tube in outdoor unit

Condensate Pump: Required ☐ Not Required ☐
Low Ambient Controls: Required ☐ Not Required ☐
Crankcase Heater: Required ☐ Not Required ☐
Wind Baffle: Required ☐ Not Required ☐

Optional:
Compressor extended warranty 6-10 years: Required ☐ Not Required ☐
All parts & labor 2-5 years: Required ☐ Not Required ☐
All parts & labor 2-5 years + Compressor 6-10 years: Required ☐ Not Required ☐

UNIT DIMENSIONS – INDOOR MODEL

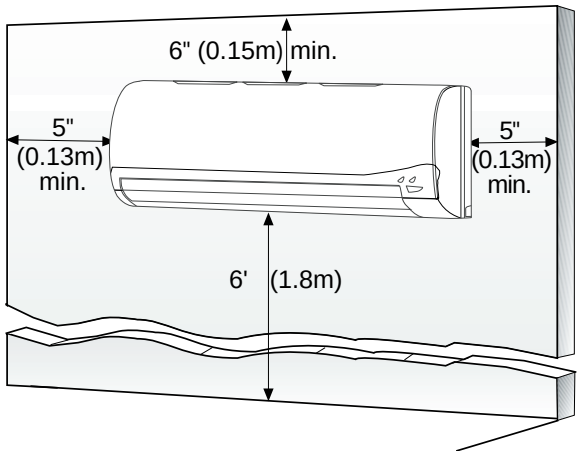
Model Size	W in. (mm)	H in. (mm)	D in. (mm)	Operating Weight lb (kg)
012	35.67 (906)	11.26 (286)	9.25 (235)	25.3 (11)



A07336

Fig. 1 – 40MVC Dimensions

UNIT CLEARANCES – INDOOR MODEL

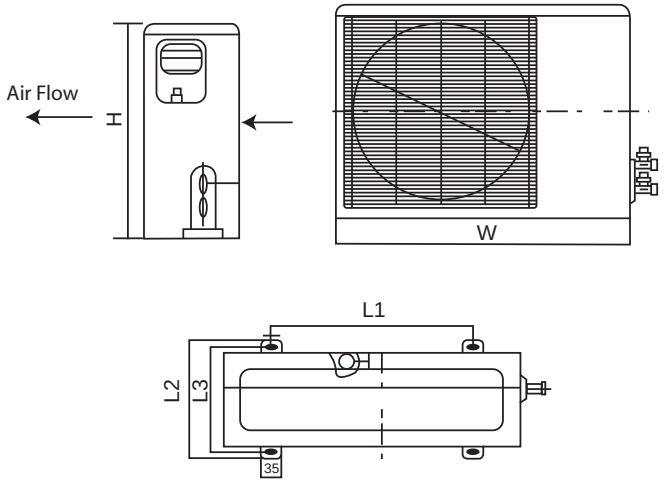


A07891

Fig. 2 – 40MVC Clearance

UNIT DIMENSIONS – OUTDOOR MODEL

Model Size	W in. (mm)	H in. (mm)	L1 in. (mm)	L2 in. (mm)	L3 in. (mm)	Weight lb (kg)
12K	29.92 (760)	23.23 (590)	20.87 (530)	12.40 (315)	11.42 (290)	79.2 (36)

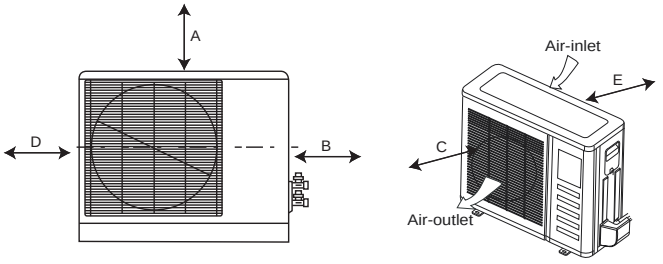


A07337

Fig. 3 – 38MVC DIMENSIONS

UNIT CLEARANCES – OUTDOOR MODEL

UNIT	12k in. (mm)
A	24 (610)
B	24 (610)
C	24 (610)
D	4 (102)
E	12 (305)



A07894

Fig. 4 – 38MVC Clearances

Printed in U.S.A. Edition Date: 03/09 **Catalog No: 38–40MVC012–3SB**

Replaces: 38–40MVC012–2SB

Appendix D – HAP **Energy Models**

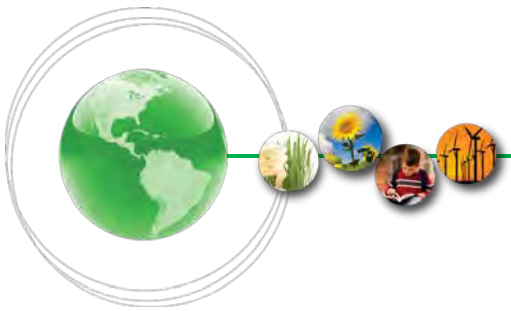


Table 1. Annual Costs

Component	City Hall - ECM Lights/DX ($)	City Hall ECM 4 ($)
Air System Fans	1,979	1,336
Cooling	2,671	2,363
Heating	472	338
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**5,122**	**4,037**
Lights	875	875
Electric Equipment	924	924
Misc. Electric	1,058	1,058
Misc. Fuel Use	0	0
Non-HVAC Sub-Total	**2,857**	**2,857**
Grand Total	**7,979**	**6,895**

Calculated Savings: $1,084

Table 2. Annual Cost per Unit Floor Area

Component	City Hall - ECM Lights/DX ($/ft²)	City Hall ECM 4 ($/ft²)
Air System Fans	0.284	0.192
Cooling	0.383	0.339
Heating	0.068	0.049
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.735**	**0.579**
Lights	0.126	0.126
Electric Equipment	0.133	0.133
Misc. Electric	0.152	0.152
Misc. Fuel Use	0.000	0.000
Non-HVAC Sub-Total	**0.410**	**0.410**
Grand Total	**1.145**	**0.989**
Gross Floor Area (ft²)	6970.0	6970.0
Conditioned Floor Area (ft²)	6970.0	6970.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	City Hall - ECM Lights/DX (%)	City Hall ECM 4 (%)
Air System Fans	24.8	19.4
Cooling	33.5	34.3
Heating	5.9	4.9
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**64.2**	**58.6**
Lights	11.0	12.7
Electric Equipment	11.6	13.4
Misc. Electric	13.3	15.3
Misc. Fuel Use	0.0	0.0
Non-HVAC Sub-Total	**35.8**	**41.4**
Grand Total	**100.0**	**100.0**

Table 1. Annual Costs

Component	Public Safety - ECM Lights/DX ($)	Public Safety ECM 4 ($)
Air System Fans	4,536	4,224
Cooling	7,354	6,531
Heating	3,086	1,819
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**14,976**	**12,574**
Lights	4,779	4,779
Electric Equipment	10,704	10,704
Misc. Electric	8,872	8,872
Misc. Fuel Use	0	0
Non-HVAC Sub-Total	**24,355**	**24,355**
Grand Total	**39,331**	**36,930**

Calculated Savings: $2,401

Table 2. Annual Cost per Unit Floor Area

Component	Public Safety - ECM Lights/DX ($/ft²)	Public Safety ECM 4 ($/ft²)
Air System Fans	0.232	0.216
Cooling	0.377	0.334
Heating	0.158	0.093
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.767**	**0.644**
Lights	0.245	0.245
Electric Equipment	0.548	0.548
Misc. Electric	0.454	0.454
Misc. Fuel Use	0.000	0.000
Non-HVAC Sub-Total	**1.247**	**1.247**
Grand Total	**2.014**	**1.891**
Gross Floor Area (ft²)	19532.0	19532.0
Conditioned Floor Area (ft²)	19532.0	19532.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Public Safety - ECM Lights/DX (%)	Public Safety ECM 4 (%)
Air System Fans	11.5	11.4
Cooling	18.7	17.7
Heating	7.8	4.9
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**38.1**	**34.0**
Lights	12.2	12.9
Electric Equipment	27.2	29.0
Misc. Electric	22.6	24.0
Misc. Fuel Use	0.0	0.0
Non-HVAC Sub-Total	**61.9**	**66.0**
Grand Total	**100.0**	**100.0**

Annual Cost Summary

Bay Front Center
CES / BGA

06/25/2013
01:48PM

Table 1. Annual Costs

Component	Baseline Bayfront Center (RTU) ($)	Bayfront ECM 4 ($)
Air System Fans	1,334	872
Cooling	2,257	1,985
Heating	220	89
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**3,811**	**2,945**
Lights	1,483	1,483
Electric Equipment	2,118	2,118
Misc. Electric	0	0
Misc. Fuel Use	0	0
Non-HVAC Sub-Total	**3,601**	**3,601**
Grand Total	**7,412**	**6,546**

Calculated Savings: $866

Table 2. Annual Cost per Unit Floor Area

Component	Baseline Bayfront Center (RTU) ($/ft²)	Bayfront ECM 4 ($/ft²)
Air System Fans	0.184	0.120
Cooling	0.311	0.274
Heating	0.030	0.012
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.526**	**0.406**
Lights	0.205	0.205
Electric Equipment	0.292	0.292
Misc. Electric	0.000	0.000
Misc. Fuel Use	0.000	0.000
Non-HVAC Sub-Total	**0.497**	**0.497**
Grand Total	**1.023**	**0.903**
Gross Floor Area (ft²)	7248.0	7248.0
Conditioned Floor Area (ft²)	7248.0	7248.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Baseline Bayfront Center (RTU) (%)	Bayfront ECM 4 (%)
Air System Fans	18.0	13.3
Cooling	30.5	30.3
Heating	3.0	1.4
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**51.4**	**45.0**
Lights	20.0	22.6
Electric Equipment	28.6	32.4
Misc. Electric	0.0	0.0
Misc. Fuel Use	0.0	0.0
Non-HVAC Sub-Total	**48.6**	**55.0**
Grand Total	**100.0**	**100.0**

Annual Cost Summary

PG_Laishley
CES / BGA

06/25/2013
01:46PM

Table 1. Annual Costs

Component	Laishley Park Marina ($)	Laishley Park Marina ECM 4 ($)
Air System Fans	1,023	964
Cooling	2,744	2,726
Heating	614	563
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**4,382**	**4,253**
Lights	2,353	2,353
Electric Equipment	747	747
Misc. Electric	0	0
Misc. Fuel Use	0	0
Non-HVAC Sub-Total	**3,100**	**3,100**
Grand Total	**7,482**	**7,352**

Calculated Savings: $130

Table 2. Annual Cost per Unit Floor Area

Component	Laishley Park Marina ($/ft²)	Laishley Park Marina ECM 4 ($/ft²)
Air System Fans	0.154	0.145
Cooling	0.413	0.410
Heating	0.092	0.085
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.659**	**0.640**
Lights	0.354	0.354
Electric Equipment	0.112	0.112
Misc. Electric	0.000	0.000
Misc. Fuel Use	0.000	0.000
Non-HVAC Sub-Total	**0.466**	**0.466**
Grand Total	**1.125**	**1.106**
Gross Floor Area (ft²)	6650.0	6650.0
Conditioned Floor Area (ft²)	6650.0	6650.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Laishley Park Marina (%)	Laishley Park Marina ECM 4 (%)
Air System Fans	13.7	13.1
Cooling	36.7	37.1
Heating	8.2	7.7
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**58.6**	**57.8**
Lights	31.4	32.0
Electric Equipment	10.0	10.2
Misc. Electric	0.0	0.0
Misc. Fuel Use	0.0	0.0
Non-HVAC Sub-Total	**41.4**	**42.2**
Grand Total	**100.0**	**100.0**

Annual Cost Summary

Cooper St Rec Ctr
CES / BGA

06/25/2013
01:43PM

Table 1. Annual Costs

Component	Baseline Cooper St Rec (OAU) ($)	Cooper St Rec ECM 4 ($)
Air System Fans	443	443
Cooling	1,200	957
Heating	184	50
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**1,828**	**1,450**
Lights	441	441
Electric Equipment	257	257
Misc. Electric	0	0
Misc. Fuel Use	0	0
Non-HVAC Sub-Total	**698**	**698**
Grand Total	**2,526**	**2,148**

Calculated Savings: $378

Table 2. Annual Cost per Unit Floor Area

Component	Baseline Cooper St Rec (OAU) ($/ft²)	Cooper St Rec ECM 4 ($/ft²)
Air System Fans	0.330	0.330
Cooling	0.893	0.712
Heating	0.137	0.037
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**1.360**	**1.079**
Lights	0.328	0.328
Electric Equipment	0.191	0.191
Misc. Electric	0.000	0.000
Misc. Fuel Use	0.000	0.000
Non-HVAC Sub-Total	**0.520**	**0.520**
Grand Total	**1.880**	**1.598**
Gross Floor Area (ft²)	1344.0	1344.0
Conditioned Floor Area (ft²)	1344.0	1344.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Baseline Cooper St Rec (OAU) (%)	Cooper St Rec ECM 4 (%)
Air System Fans	17.5	20.6
Cooling	47.5	44.5
Heating	7.3	2.3
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**72.4**	**67.5**
Lights	17.5	20.5
Electric Equipment	10.2	12.0
Misc. Electric	0.0	0.0
Misc. Fuel Use	0.0	0.0
Non-HVAC Sub-Total	**27.6**	**32.5**
Grand Total	**100.0**	**100.0**

Table 1. Annual Costs

Component	Public Works - ECM Lights ($)	Public Works ECM 4 ($)
Air System Fans	1,763	1,175
Cooling	2,837	2,562
Heating	263	128
Pumps	0	0
Heat Rejection Fans	0	0
HVAC Sub-Total	**4,864**	**3,865**
Lights	3,610	3,610
Electric Equipment	2,408	2,408
Misc. Electric	341	341
Misc. Fuel Use	0	0
Non-HVAC Sub-Total	**6,359**	**6,359**
Grand Total	**11,222**	**10,224**

Calculated Savings: $998

Table 2. Annual Cost per Unit Floor Area

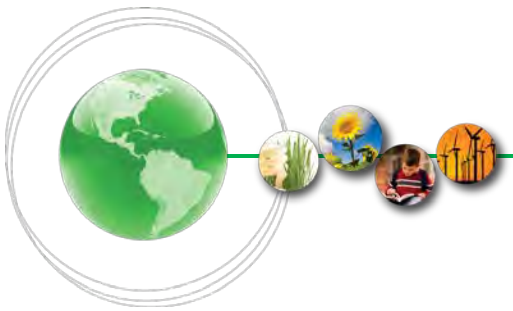
Component	Public Works - ECM Lights ($/ft²)	Public Works ECM 4 ($/ft²)
Air System Fans	0.063	0.042
Cooling	0.101	0.092
Heating	0.009	0.005
Pumps	0.000	0.000
Heat Rejection Fans	0.000	0.000
HVAC Sub-Total	**0.174**	**0.138**
Lights	0.129	0.129
Electric Equipment	0.086	0.086
Misc. Electric	0.012	0.012
Misc. Fuel Use	0.000	0.000
Non-HVAC Sub-Total	**0.227**	**0.227**
Grand Total	**0.401**	**0.365**
Gross Floor Area (ft²)	28000.0	28000.0
Conditioned Floor Area (ft²)	28000.0	28000.0

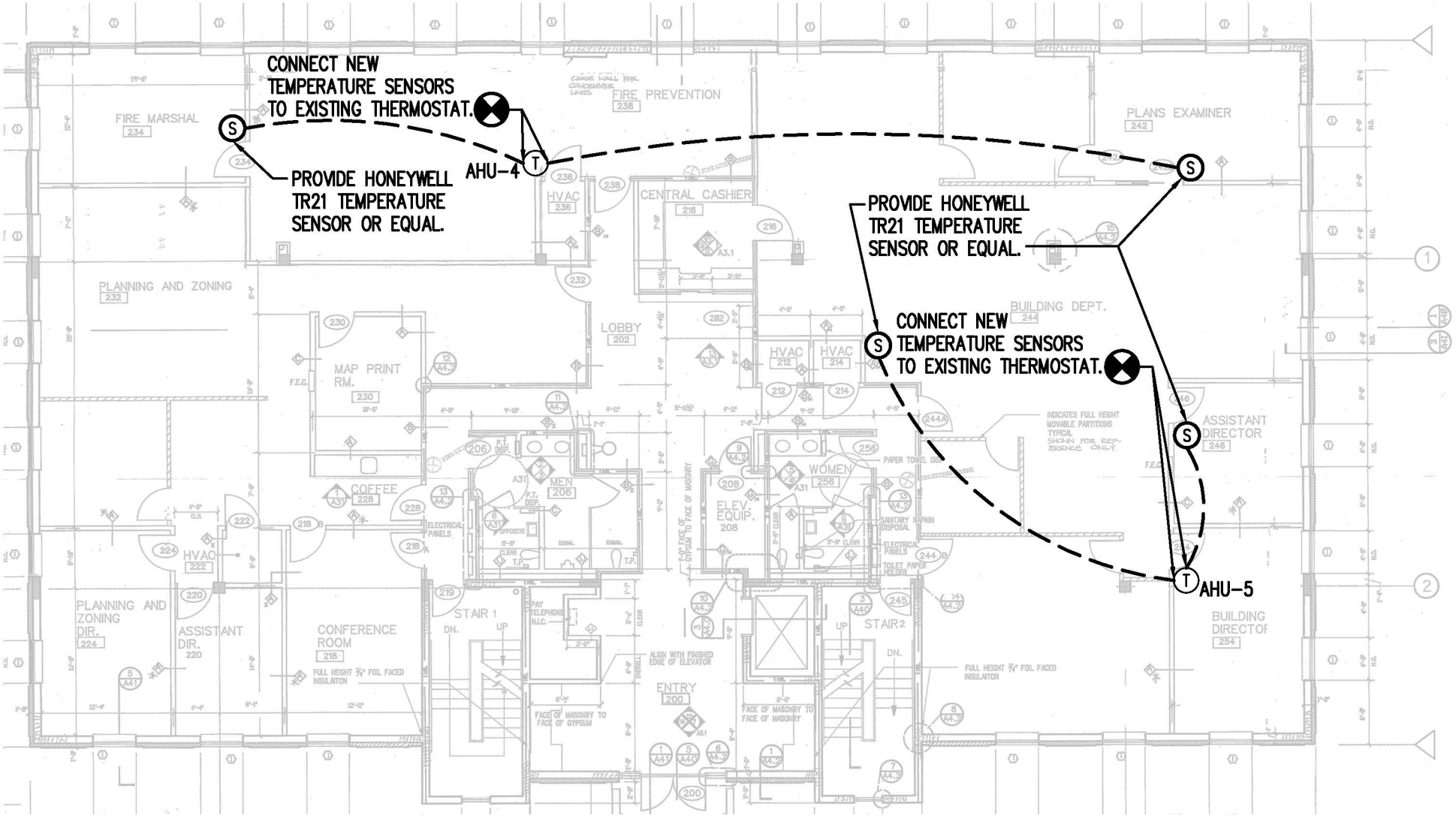
Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Public Works - ECM Lights (%)	Public Works ECM 4 (%)
Air System Fans	15.7	11.5
Cooling	25.3	25.1
Heating	2.3	1.3
Pumps	0.0	0.0
Heat Rejection Fans	0.0	0.0
HVAC Sub-Total	**43.3**	**37.8**
Lights	32.2	35.3
Electric Equipment	21.5	23.5
Misc. Electric	3.0	3.3
Misc. Fuel Use	0.0	0.0
Non-HVAC Sub-Total	**56.7**	**62.2**
Grand Total	**100.0**	**100.0**

Appendix E – Temperature Sensor Locations



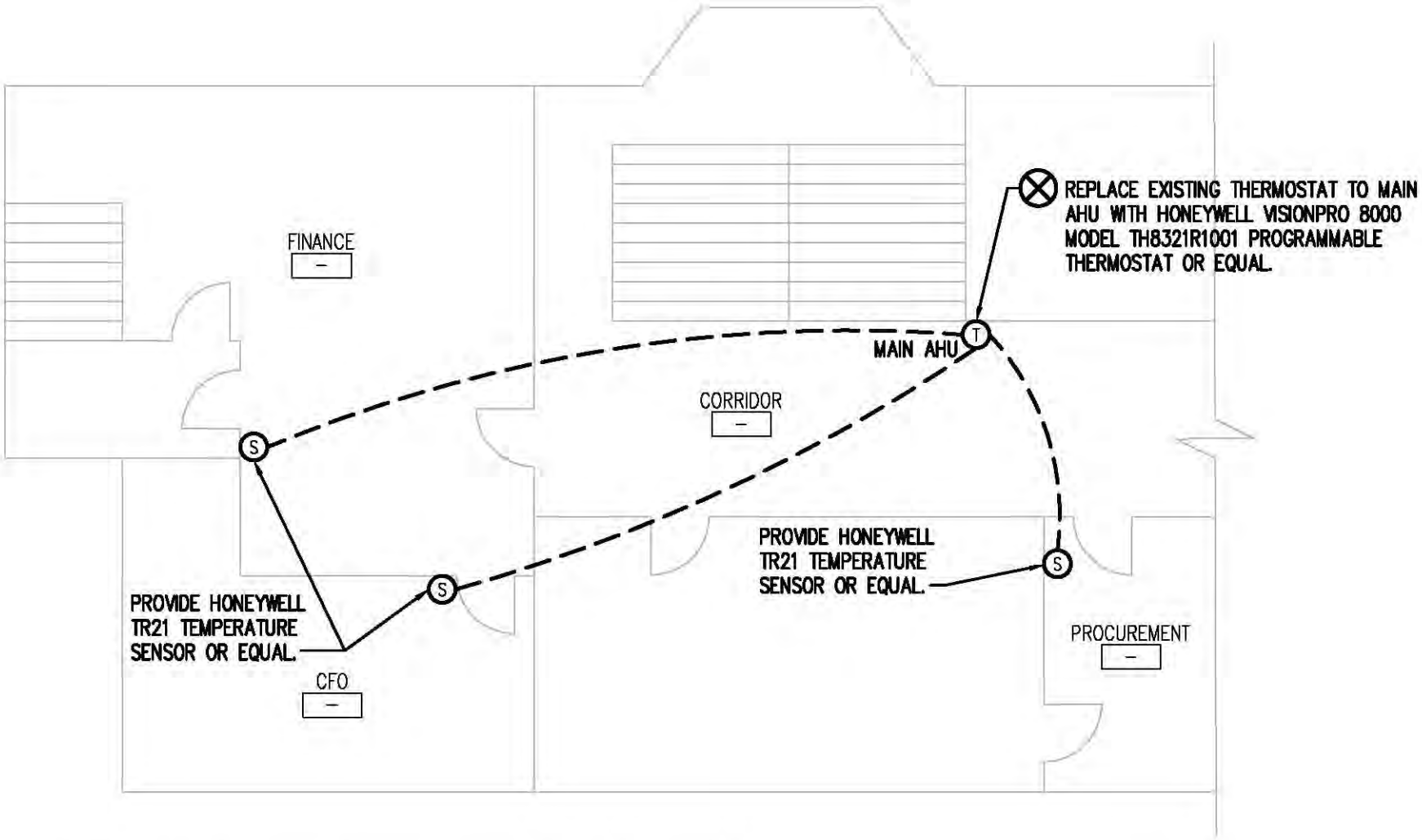


CITY HALL ANNEX TEMPERATURE SENSORS

NOTE:
MOUNT ALL NEW SPACE THERMOSTATS AND/OR SENSORS 4 FEET ABOVE THE FLOOR.

LEGEND

(T) AHU LABEL	EXISTING THERMOSTAT
(S)	NEW TEMPERATURE SENSOR
	POINT OF INTERFACE BETWEEN NEW & EXISTING



CITY HALL TEMPERATURE SENSORS

NOTE:
MOUNT ALL NEW SPACE THERMOSTATS AND/OR SENSORS 4 FEET ABOVE THE FLOOR.

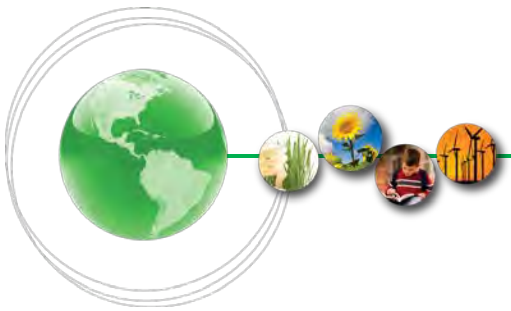
LEGEND

AHU LABEL (T) NEW THERMOSTAT

(S) NEW TEMPERATURE SENSOR

POINT OF DEMOLITION

Appendix F – HVAC **Equipment** Inventory



City of Punta Gorda HVAC Inventory

Department	Location/ID	Equipment Type	Manufacturer	Model #	Serial #	Electrical	Capacity (Tons)	Year	Efficiency*	Coil Condition
City Hall	Council Chamber	CU	TEMPSTAR	CA9030VKD2	L991567231	208-230v/1ph	2.5	1999	10 SEER	Fair
City Hall	Records Room	PACKAGED	TRANE	TCK042A100AB	4372JJ13H	208-230v/1ph	3.5	2004	12 SEER	Good
City Hall	Booster Unit	CU	CARRIER	24ABR324A310	0206E15913	208-230v/1ph	2	2006	13 SEER	Fair
City Hall	Main Unit 1st Stage	CU	ICP/TEMPSTAR	CAE090HBA	E040627761	208-230v/3ph	7.5	2004	9.7 EER	Good
City Hall	Main Unit 2nd Stage	CU	GOODMAN	GSC100903AC	1104152725	208-230v/3ph	7.5	2011	11 EER	Good
City Hall	Council Hallway	CU	TEMPSTAR	CA5042UKA1867800240	L921918347	208-230v/1ph	3.5	1992	10 SEER	Poor
City Hall	Council Room 1st Stage	CU	TEMPSTAR	CA5060UKA2867800261	L924021590	208-230v/1ph	5	1992	10 SEER	Poor
City Hall	Council Room 2nd Stage	CU	AMERISTAR	2A7M03060A1000AA	L930181939	208-230v/1ph	5	1993	10 SEER	Poor
City Hall	Break Room	CU	TEMPSTAR	CA5024UKB1	L944370539	208-230v/1ph	2	1994	10 SEER	Poor
City Hall	City Clerk Office	CU	TEMPSTAR	CA9024UKC1	L942349831	208-230v/1ph	2	1994	10 SEER	Poor
City Hall	Finance	CU	RUUD	UAMB030JAZ	6262F390210595	208-230v/1ph	2.5	2002	10 SEER	Fair
City Hall	Chamber of Commerce	CU	PAYNE	PA10JA030-A	0901E10226	208-230v/1ph	2.5	2001	10 SEER	Fair
City Hall Annex	Unit 1	CU	TRANE	TTD748B100A0	F37258913	208-230v/1ph	4	1991	8.5 SEER	Poor
City Hall Annex	Unit 2	CU	TRANE	TTD760B100A2	F05271420	208-230v/1ph	5	1991	8.5 SEER	Poor
City Hall Annex	Unit 3	CU	TRANE	TTA090D300AA	10173PJMAD	208-230v/3ph	7.5	2010	11.2 EER	Good
City Hall Annex	Unit 4	CU	TRANE	TTA090A300AA	F43193374	208-230v/3ph	7.5	1991	8.3 EER	Poor
City Hall Annex	Unit 5	CU	TRANE	TTD760B100A2	F05271421	208-230v/1ph	5	1991	8.5 SEER	Poor
City Hall Annex	Unit 6	CU	RHEEM	RAWL090CAZ	7753F121102731	208-230v/3ph	7.5	2011	11.2 EER	Good
City Hall Annex	Unit 7	CU	TRANE	TTD742B100A0	E21201762	208-230v/1ph	3.5	1990	8.5 SEER	Poor
City Hall Annex	Unit 8	CU	AMERICAN STD	2A8A1060A1000AA	4331KU03F	208-230v/1ph	5	2004	11 SEER	Poor
City Hall Annex	Unit 9	CU	TEMPSTAR	CA5536VKD2	L974741134	208-230v/1ph	3	1997	10 SEER	Poor
City Hall Annex	Unit 10	CU	FEDDERS	C30ABD1V	EV137041151X	208-230v/1ph	2.5	2004	10 SEER	Poor
City Hall Annex	CRAC-1	CU	MITSUBISHI	PUG30AYB	WEMM060763	208-230v/1ph	2.5	2003	10 SEER	Fair
City Hall Annex	CRAC-2	CU	FUJITSU	A0U36CLX	007362	208-230v/1ph	3	2007	10 SEER	Good
Freeman House	Upper Level	CU	AMERISTAR	2A7B2030A1000AA	543214A3F	208-230v/1ph	2.5	2005	10 SEER	Good
Freeman House	Lower Level	PACKAGED	TRANE	TCK042A100BA	6034NCA3H	208-230v/1ph	3.5	2006	12 SEER	Good
Public Safety	Police Department/CU-1	CU	CARRIER	38AKS014-71202	1602F47639	208-230v/3ph	12.5	2002	9.9 EER	Poor
Public Safety	Police Department/CU-2	CU	CARRIER	38AKS016-71202	1702F48994	208-230v/3ph	15	2002	9.9 EER	Poor
Public Safety	Police Department	Dual Path AHU	TEMTROL	WF-DH-19	63985	208-230v/3ph	25	2002	See CU	Poor
Public Safety	Fire Department/CU-3	CU	GOODMAN	GSC13060BA	UNKNOWN	208-230v/3ph	5	UNK	13 SEER	Good
Public Safety	Fire Department/CU-4	CU	CARRIER	38ARS012-501AA	1802G40002	208-230v/3ph	10	2002	9.9 EER	Poor

Department	Location/ID	Equipment Type	Manufacturer	Model #	Serial #	Electrical	Capacity (Tons)	Year	Efficiency*	Coil Condition
Public Safety	Fire Department	Dual Path AHU	TEMTROL	WF-DH-10	UNKNOWN	208-230v/3ph	13.25	2002	See CU	Poor
Public Safety	Dispatch 911/CU-5	CU	CARRIER	38CKC042540	1402E07694	208-230v/3ph	3.5	2002	10 SEER	Poor
Public Safety	Dispatch 911 Comp Rm	CU	FUJITSU	A0U36CLX	002321	208-230v/1ph	3	2002	10 SEER	Fair
Public Safety	Weight Room	WINDOW AC	LG	6DEX1690	612TALB01824	208-230v/1ph	1	2002	8.5 EER	Fair
Public Safety	Evidence Garage	CU	RHEEM	RAMC024JAZ	6972M200405066	208-230v/1ph	2	2004	10 SEER	Fair
Fire Station #2	Living Quarters	CU	TRANE	2TTB3060A1000AA	8313TYP4F	208-230v/1ph	5	2008	13 SEER	Good
Fire Station #2	Living Quarters	CU	TRANE	2TTB3060A1000AA	8321S7M4F	208-230v/1ph	5	2008	13 SEER	Good
Fire Station #2	Office	CU	TRANE	2TTB3024A1000AA	83414XE3F	208-230v/1ph	2	2008	13 SEER	Good
Fire Station #3	Exercise Room	CU	TRANE	TTP018C100A3	R4117JG3F	208-230v/1ph	1.5	2000	10 SEER	Poor
Fire Station #3	Living Quarters	CU	TRANE	2A6M3048A1000AA	9061TFN4F	208-230v/1ph	4	2009	13 SEER	Good
Fire Station #3	Chief's Office	CU	TRANE	TWP042C100A4	R4358TT2F	208-230v/1ph	3.5	2000	10 SEER	Poor
Public Works	101	CU	GOODMAN	GSC130301AE	UNKNOWN	208-230v/1ph	2.5	UNK	13 SEER	UNK
Public Works	101	CU	TRANE	4TTA3060A3000BA	UNKNOWN	208-230v/3ph	5	UNK	13 SEER	UNK
Public Works	102	CU	TRANE	4TTB3042C1000AA	UNKNOWN	208-230v/1ph	3.5	UNK	13 SEER	UNK
Public Works	102	CU	GOODMAN	GSC130301AE	UNKNOWN	208-230v/1ph	2.5	UNK	13 SEER	UNK
Public Works	103	CU	GOODMAN	GSC130241AE	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Public Works	104	CU	GOODMAN	GSC130241AE	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Public Works	105	CU	GOODMAN	GSC130301AE	UNKNOWN	208-230v/1ph	2.5	UNK	13 SEER	UNK
Public Works	105	CU	TRANE	4TTB3024A1000BA	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Public Works	106	CU	GOODMAN	GSC130241AE	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Public Works	107	CU	GOODMAN	GSC130241AE	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Public Works	108	CU	GOODMAN	GSC130241AE	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Public Works	109	CU	GOODMAN	GSC130241AE	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Public Works	110	CU	GOODMAN	GSC130241AE	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Utilities	201	CU	GOODMAN	GSC130301AE	UNKNOWN	208-230v/1ph	2.5	UNK	13 SEER	UNK
Utilities	201	CU	TRANE	4TTA3048A3000BA	UNKNOWN	208-230v/3ph	4	UNK	13 SEER	UNK
Utilities	201	CU	TRANE	4TTB3036B1000BA	UNKNOWN	208-230v/1ph	3	UNK	13 SEER	UNK
Utilities	208	CU	GOODMAN	GSC130301AE	UNKNOWN	208-230v/1ph	2.5	UNK	13 SEER	UNK
Utilities	208	CU	TRANE	4TTB3024A1000BA	UNKNOWN	208-230v/1ph	2	UNK	13 SEER	UNK
Utilities	209	CU	GOODMAN	GSC130301AE	UNKNOWN	208-230v/1ph	2.5	UNK	13 SEER	UNK
Utilities	216	CU	GOODMAN	GSC130301AE	UNKNOWN	208-230v/1ph	2.5	UNK	13 SEER	UNK
Laishley Park Marina	Marina Building	CU	TRANE	2TTA0048A3000AA	6425NTU3F	208-230v/3ph	4	2006	10 SEER	Good
Laishley Park Marina	Marina Building	CU	TRANE	2TTA0048A3000AA	6225NKB3F	208-230v/3ph	4	2006	10 SEER	Good

Department	Location/ID	Equipment Type	Manufacturer	Model #	Serial #	Electrical	Capacity (Tons)	Year	Efficiency*	Coil Condition
Laishley Park Marina	Marina Building	CU	TRANE	2TTA0060A3000AA	6512LPW3F	208-230v/3ph	5	2006	10 SEER	Good
Laishley Park Marina	Marina Building	CU	RHEEM	13AJA4201	UNKNOWN	208-230v/1ph	3.5	UNK	13 SEER	UNK
Laishley Park Marina	Marina Building	CU	RHEEM	13AJA4201	UNKNOWN	208-230v/1ph	3.5	UNK	13 SEER	UNK
Cooper Street Rec Ctr	Game Room	RTU	TEMPSTAR	PAF036K000E	G051711777	208-230v/3ph	3	2005	10 SEER	Fair
Cooper Street Rec Ctr	Game Room	RTU	TEMPSTAR	PAF036K000E	G051850934	208-230v/3ph	3	2005	10 SEER	Fair
Cooper Street Rec Ctr	Old Section	RTU	TEMPSTAR	PAF036K000E	G051711774	208-230v/3ph	3	2005	10 SEER	Fair
Cooper Street Rec Ctr	Library	RTU	TEMPSTAR	PAF036K000E	G051711775	208-230v/3ph	3	2005	10 SEER	Fair
Cooper Street Rec Ctr	Computer Room	RTU	TEMPSTAR	PAF036K000E	G051851942	208-230v/3ph	3	2005	10 SEER	Fair
Cooper Street Rec Ctr	New Section	CU	CARRIER	245ACB324A300	UNKNOWN	208-230v/1ph	2	2008	13 SEER	Good
Cooper Street Rec Ctr	New Section	CU	CARRIER	245ACB324A300	UNKNOWN	208-230v/1ph	2	2008	13 SEER	Good
Cooper Street Rec Ctr	New Section	CU	CARRIER	245ACB324A300	UNKNOWN	208-230v/1ph	2	2008	13 SEER	Good
Cooper Street Rec Ctr	Outdoor Air Unit	CU	ADDISON	RCA101A0001F0K0	UNKNOWN	UNKNOWN	9	UNK	11.3 EER	UNK
Bayfront Center	Community Room	RTU	CARRIER	50TM006A301	2005G30158	208-230v/1ph	5	2005	10 SEER	Good
Bayfront Center	Community Room	RTU	CARRIER	50TM006A301	2105G20165	208-230v/1ph	5	2005	10 SEER	Good
Bayfront Center	Community Room	RTU	CARRIER	50TM006A301	2105G50212	208-230v/1ph	5	2005	10 SEER	Good
Bayfront Center	Community Room	RTU	CARRIER	50TM006A301	2105G20166	208-230v/1ph	5	2005	10 SEER	Good
Bayfront Center	Scout Room	CU	RHEEM	RAKA037JAZ	5429F230112969	208-230v/1ph	3	2001	10 SEER	Fair
Bayfront Center	Boat Club	CU	RHEEM	RAKA024JAZ	5882M510104736	208-230v/1ph	2	2002	10 SEER	Fair
Bayfront Center	Kitchen	CU	TEMPSTAR	CA9030VKD1	L963124368	208-230v/1ph	2.5	1996	10 SEER	Fair
WTP	Unknown	CU	GOODMAN	GSX130361BA	100443750	208-230v/1ph	3	2010	13 SEER	Good
WTP	Main Bldge West	CU	TRANE	2TTR2060B1000AA	3211WNH2F	208-230v/1ph	5	2003	12 SEER	Fair
WTP	Main Bldge West	CU	TRANE	2TTR2036A1000AA	32046KF3F	208-230v/1ph	3	2003	12 SEER	Fair
WTP	Unknown	PACKAGED	UNKNOWN	UNKNOWN	UNKNOWN	208-230v/?ph	UNK	UNK	UNK	UNK
WTP	Main Bldge East	CU	TRANE	2TTR2036A1000AA	32027P34F	208-230v/1ph	3	2003	12 SEER	Fair
WTP	Main Bldge East	CU	TRANE	2TTR2048A1000AA	320477K3F	208-230v/1ph	4	2003	12 SEER	Fair
WTP	Main Bldge Storage	CU	ADDISON	RCA101003E	30504502001	208-230v/3ph	9.3	2003	11.3 EER	Fair
WTP	Outside Electrical Room	CU	AMANA	RCE30A2B	0006182600	208-230v/1ph	2.5	2006	14 SEER	Good
WWTP	Administration Bldg	CHILLER	CARRIER	30HWB018-040	UNKNOWN	UNKNOWN	30	UNK	13 EER	UNK
WWTP	Administration Bldg	COOL TOWER	PROTEC	PCT-50	UNKNOWN	UNKNOWN	50	UNK	See CHILLER	UNK
WWTP	Effluent Pump Station	CU	CARRIER	38BRC	UNKNOWN	UNKNOWN	4	UNK	12 SEER	UNK

*For obsolete units without factory performance data available, efficiency ratings were determined by the Energy Code in effect at time of manufacture.