OPTERRA
ENERGY SERVICES

Investment Grade Energy Audit Report

Broward County RFP No. R1243101P1

January 17, 2018

An ENGIE company

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1. Executive Summary

Introduction

OpTerra Energy Services (OpTerra) is pleased to present this County-Wide Energy Efficiency and Energy Management Assessment Investment Grade Audit (IGA) Report. The Report investigates the County designated "Group B" listing of sites and was prepared to not only assess the County's facilities and equipment but to also identify opportunities to utilize resources more efficiently. Further, in the Report we analyzed the feasibility of generating clean renewable energy through solar photovoltaic (PV) power.

Broward County has an aggressive history of implementing energy efficiency improvements by investing in energy savings projects and programs. The County has made great progress in energy efficiency, but now seeks to achieve even higher goals. To that end, after a public qualification and selection process, the County Commission approved OpTerra to begin the process of assessing facilities. Under the first phase, OpTerra generated a Feasibility Study which was delivered to the County on July 13, 2017. The County then provided OpTerra with a list of facilities and content on which to focus for Phase 2, the Investment Grade Audit. The IGA is a more complex and comprehensive energy assessment of the "Group B" sites that includes recommendations for an energy performance contract program. In a meeting on August 10, 2017, the County Facilities Management staff directed OpTerra to identify and propose a project and implementation plan to achieve the following criteria:

1. Provide a comprehensive program, including efficiency and renewable technologies for facilities listed in the "Group B" sites listing provided by the County on August 14, 2017. The primary focus of the program was to be on facility ECMs (Energy Conservation Measures) having a payback of less than 12 years with the following exceptions and qualifications:
    a. Solar PV is focused only on Broward County branded buildings (for example, the homeless shelters are not included)
    b. Include Heating, Ventilation and Air Conditioning (HVAC) equipment upgrades that are a part of the County's 5-year Capital Improvement Plan (CIP), as received on August 14, 2017.
    c. Include replacements for HVAC equipment utilizing HCFC-22 (R-22) Refrigerant.
2. Showcase water consumption saving opportunities for cooling tower (CT) blowdown.
3. The following should be considered and/or included in the IGA with respect to the Parks.
    a. Park management will choose the manufacturer on all lights that are to be installed at their sites.
    b. Where applicable, evaluate on-site generation of hypochlorite pool chemicals.

A description of how this criterion was achieved within this Audit is described in the Report.

Scope of Report & Summary of ECMs

The following Broward County Facilities are included in this Report.

Op Terra - "Group B" Facilities

	Site	Address	City	Building Sq. Ft.
Parks	CD REGIONAL	3700 NW 11TH PL	Lauderhill	50,516
	TOPEEKEEGEE YUGNEE	3300 N. PARK RD.	Hollywood	44,378
	EASTERLIN	1000 NW 38ST.	Oakland Park	36,194
	TREE TOPS	3900 S.W. 100TH AVE.	Davie	26,103
	LONG KEY	3501 SW 130TH AVENUE	Davie	23,591
	WEST LAKE / Anne Kolb NC	751 SHERIDAN ST	Hollywood	20,776
	BRIAN PICCOLO	9501 SHERIDAN ST	Cooper City	11,706
	FERN FOREST	4800 SW 4 ST	Margate	9,893
	PLANTATION HERITAGE	1100 S. FIG TREE LN.	Plantation	7,674
	SECRET WOODS	2701 W. STATE RD. 84	Dania Beach	7,257
	HOLLYWOOD NORTH BEACH	3601 N OCEAN DRIVE	Hollywood	4,000
	SAW PALMETTO	4950 NW 71ST PL	Coconut Creek	160
Libraries	LIBRARY, AF, African American	2650 NW 6th Street	Ft Lauderdale	61,150
	LIBRARY, SW, SW Regional	16835 Sheridan St	Pembroke Pines	79,747
	LIBRARY, WR, West Regional	100 North Pine Island Road	Plantation	72,000
	LIBRARY, NO, North West Regional	3151 University Drive	Coral Springs	72,000
	LIBRARY, WE, Weston	4205 Bonaventure Boulevard	Weston	51,000
	LIBRARY, LL, Lauderdale Lakes	3580 West Oakland Park Blvd	Lauderdale Lakes	20,237
	LIBRARY, SL, Stirling Road	3151 Stirling Road	Hollywood	20,000
	LIBRARY, NL, North Lauderdale	6601 Boulevard of Champions	North Lauderdale	20,000
	LIBRARY, SN, Dan Pearl	10500 W Oakland Park Blvd	Sunrise	19,500
	LIBRARY, MG, Margate	5810 Park Drive	Margate	15,800
	LIBRARY, HL, Hallandale	300 South Federal Highway	Hallandale	14,700
	LIBRARY, CP, Century Plaza	1890 Hillsboro Boulevard	Deerfield Beach	11,682
	LIBRARY, DA, Dania Beach	1 Park Avenue, East	Dania	9,970
	LIBRARY, CR, Carver Ranches	4733 SW 18th Street	West Park	16,700
	LIBRARY, NW, Pompano Branch	1580 NW 3rd Avenue	Pompano Beach	10,000
Office & Courthouse	Public Safety Complex	2602 West Broward Boulevard	Fort Lauderdale	300,720
	North Regional Courthouse	1600 W Hillsboro Blvd.	Deerfield Beach	200,000
	Government Center West	1 North University Dr.	Plantation	184,820
	TRAF ENGN Administration North	2300 W Commercial Blvd	Fort Lauderdale	71,346
	PARK Administration Complex	950 NW 38th St	Oakland Park	35,296
	INTEG WAST South Landfill	6541- 7101 SW 205th Avenue	Fort Lauderdale	17,847
Health and Lab	Central Homeless Asst. Ctr.	920 NW 7th Ave	Ft Laud	63,244
	Booher Building	3275 NW 99th Way	Coral Springs	53,060
	North Homeless Asst. Ctr.	1700 Blount road	Pomp Bch	44,254
	Family Success Center, N, Pompano	2011 NW 3rd Avenue	Pompano Beach	11,929
	Sexual Assault Treatment Center	400 NE 4th Street	Fort Lauderdale	10,643
	EPD Environmental Monitoring Facility & Lab	3211 College Avenue	Davie	9,694
	EAP Our House	408 NE 4th Street	Fort Lauderdale	1,127
Parking, Warehouse, and Repair	MASS TRAN, North Maintenance	3201 Copans Road	Pompano Beach	195,189
	BSO Maintenance Facility	2001 NW 31st Avenue	Lauderdale Lakes	14,800
	BCJC South Parking Garage	612 - 644 South Andrews Avenue	Fort Lauderdale	14,397
	HIGH & BRDG Mosquito Control, Pembroke	1200 South University Drive	Pembroke Park	9,865
	South Maintenance Shop	8500 Griffin Road	Davie	6,024
	MASS TRAN Northeast Terminal	304 Hammondville Boulevard	Pompano Beach	2,000
TOTAL FOR ALL "GROUP B" FACILITIES				1,982,989

As part of this Audit, our staff studied the County's energy use data, surveyed the County's facilities, inventoried equipment, developed ECMs, and modeled the facilities for performance improvements as a result of the ECMs. Whole building energy simulations were utilized for eight of the larger facilities, which accounted approximately 40 percent of the total square footage within the "Group B" list of buildings. An implementation plan is provided, which includes the pricing proposal and schedule for the turnkey design-build installation of each of the measures. The ECMs identified and recommended for implementation are:

- Interior and exterior LED lighting upgrades, including parks
- Mechanical system replacements and improvements
- Building Automation System (BAS) improvements
- Water conservation
- Building envelope sealing
- Solar PV renewable energy generating systems

The Investment Grade Audit Report sections following this Executive Summary will describe the specific scope of the recommended ECMs, where they will be applied, and the benefits expected to be achieved as a result.

Program Energy Savings, Financial, and Implementation

Energy Savings Impact

The County is a leader and an example for others to follow in sustainability, fiscal responsibility and environmental stewardship. Through this project initiative, the County will significantly reduce is usage of ozone depleting and high Global Warming Potential refrigerant (HCFC-22); which will further enhance its position as a leader in both environmental and fiscal responsibility, and realize the following achievements:

- **Guaranteed savings of nearly $35.5 million over the project term.**
- **This project will reduce the amount of electricity the County purchases annually by 16,658,109 kWh, a 42.4 percent reduction.**
    - Energy Conservation Measures will reduce building consumption by 23.8 percent for Group B Buildings.
    - On-Site Generation, via Solar Photovoltaic Arrays, will reduce Broward County's purchasing by another 18.6 percent for Group B Buildings.
- Save 5,638,000 gallons per year of fresh, drinkable water.
- Eliminate 13,616 tons of carbon dioxide entering the atmosphere each year, which is equivalent of removing 2,645 passenger vehicles from the roadways.
- Hedge Broward County's exposure against future energy price increases by significantly reducing electricity purchased from FP&L.
- Encourage and continue to support community sustainability actions through Broward Sustainability Stewards, using this project as an example to showcase Broward County's passion to continually drive sustainability, environmental awareness, and STEM activities throughout the community.

Project Financial Impact

Energy Conservation Measure Category	Project Cost ($)	Cummulative Demand Savings (kW)	Electric Consumption Savings (kWh)	Gas Energy Savings (Therms)	Water/ Sewer Savings (kgal)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Controls	$2,886,625	-198.2	2,422,731	0	0	$116,160	$0	$116,160
Mechanical	$4,631,085	1,262.6	438,919	0	41	$39,820	$12,264	$52,084
Lighting	$7,699,323	10,834.3	6,312,473	0	0	$521,225	$159,500	$680,725
Water	$561,570	0.0	71,525	0	7,793	$67,758	$3,535	$71,293
Building Envelope	$109,689	0.0	121,247	0	0	$10,797	$0	$10,797
Solar	$14,991,001	1,475.5	7,291,214	0	0	$408,950	$0	$408,950
Other	$3,514	0.0	0	0	0	$0	$350	$350
COUNTY TOTALS	**$30,882,807**	**13,374.2**	**16,658,109**	**0**	**7,834**	**$1,164,710**	**$175,649**	**$1,340,359**

Program Implementation & Schedule

Under this program, OpTerra maintains total responsibility to the County. We are responsible for the final design and engineering, equipment procurement, subcontracts, scheduling and coordination. Further, we include a rigorous system commissioning protocol, maintain all documentation, and fully train County staff in preparation for the overall performance guarantee. All aspects of the work are closely coordinated with County in a collaborative manner to assure complete satisfaction.

We foresee this project being completed within eighteen months from notice-to-proceed. We estimate spending four months on final engineering, followed by twelve months of construction and two months to complete project closeout. The final project schedule will be developed in coordination with the County following project award.

In addition, OpTerra proposes to implement a training program to support Broward County Facilities Staff on the new ECM's being installed which will support an increased equipment lifecycle, enhanced energy efficiency, environmental sustainability and workforce development.

The projected cash flow analysis for this project.

Financial Aspects of Performance Based Energy Program for
Broward County
Fort Lauderdale, FL

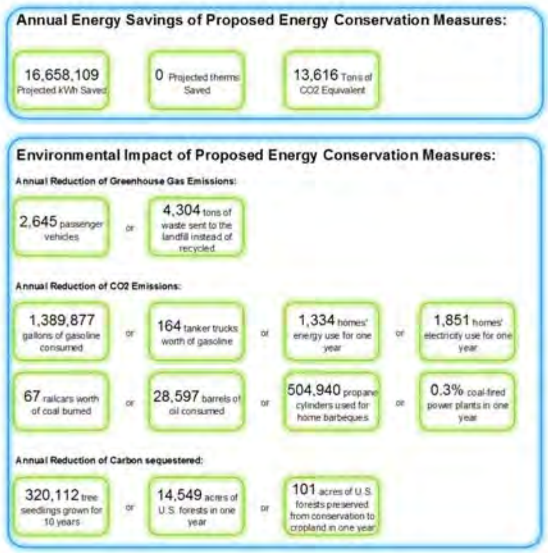
Implementation Cost	$30,527,663
Development Fee	$355,144
Total Project Fee	**$30,882,807**
Rebates, Incentives & Grants	$9,975
Net Project Amount	**$30,872,832**

1	2	3	4	5	6	7	8	9	10
Year	**Solar PV Generated kWh**	**Solar PV Utility Offset Savings**	**Energy Consumption Savings**	**Operational and Maintenance Savings**	**Total Guaranteed Project Savings**	**Measurement & Verification Services**	**Operation & Maintenance Services**	**Total Program Costs**	**Net Savings**
1	7,291,214	$408,950	$755,760	$175,650	$1,340,359	$42,903	$105,167	$148,070	$1,192,289
2	7,254,758	$419,112	$778,432	$180,920	$1,378,464	$44,190	$108,322	$152,512	$1,225,952
3	7,218,484	$429,527	$801,785	$186,347	$1,417,659	$45,516	$111,572	$157,088	$1,260,571
4	7,182,392	$440,201	$825,839	$191,937	$1,457,977	$46,881	$114,919	$161,800	$1,296,177
5	7,146,480	$451,140	$850,614	$197,696	$1,499,450	$48,287	$118,366	$166,653	$1,332,797
6	7,110,747	$462,351	$876,132	$203,626	$1,542,109	$49,736	$121,917	$171,653	$1,370,456
7	7,075,194	$473,840	$902,416	$209,735	$1,585,991	$51,228	$125,575	$176,803	$1,409,188
8	7,039,818	$485,615	$929,488	$216,027	$1,631,130	$52,765	$129,342	$182,107	$1,449,023
9	7,004,618	$497,683	$957,373	$222,508	$1,677,564	$54,348	$133,222	$187,570	$1,489,994
10	6,969,595	$510,050	$986,094	$229,183	$1,725,327	$55,978	$137,219	$193,197	$1,532,130
11	6,934,747	$522,725	$1,015,677	$236,059	$1,774,461	$57,657	$141,335	$198,992	$1,575,469
12	6,900,074	$535,715	$1,046,147	$243,141	$1,825,003	$59,387	$145,576	$204,963	$1,620,040
13	6,865,573	$549,027	$1,077,531	$250,435	$1,876,993	$61,169	$149,943	$211,112	$1,665,881
14	6,831,245	$562,671	$1,109,857	$257,948	$1,930,476	$63,004	$154,441	$217,445	$1,713,031
15	6,797,089	$576,653	$1,143,153	$265,686	$1,985,492	$64,894	$159,074	$223,968	$1,761,524
16	6,763,104	$590,983	$1,177,448	$273,657	$2,042,088	$66,841	$163,847	$230,688	$1,811,400
17	6,729,288	$605,669	$1,212,771	$281,867	$2,100,307	$68,846	$168,762	$237,608	$1,862,699
18	6,695,642	$620,720	$1,249,154	$290,323	$2,160,197	$70,911	$173,825	$244,736	$1,915,461
19	6,662,164	$636,144	$1,286,629	$299,032	$2,221,805	$73,038	$179,040	$252,078	$1,969,727
20	6,628,853	$651,953	$1,325,228	$308,003	$2,285,184	$75,229	$184,411	$259,640	$2,025,544
Totals	139,101,078	$10,430,729	$20,307,528	$4,719,780	$35,458,036	$1,152,808	$2,825,875	$3,978,683	$31,479,353

Notes By Column:
(1) Years after implementing retrofit changes.
(2) Annual kWh generated by the solar PV systems installed. Annual solar PV generation is derated at 0.5% per year.
(3) Annual utility cost offset by solar PV generation. Solar production is derated annually; however, Utility Offset is escalation by 3%, after derating, to account for inflation.
(4) Annual energy savings generated by installed Energy Conservation Measures (ECMs). Energy Consumption Savings are escalated by 3% to account for inflation.
(5) Operational and Maintenance Savings are stipulated and escalated by 3% to account for inflation.
(6) Total Guaranteed Project Savings are the sum of Columns (3), (4), and (5).
(7) Measurement and Verification Services are escalated by 3% to account for inflation.
(8) Annual Operation and Maintenance Services are billed annually to Broward County for Solar PV Preventative Maintenance, and are escalated at 3% to account for inflation.
(9) Annual Program Costs are the sum of Columns (7), (8), and (9).
(10) Net Savings equals Total Guaranteed Project Savings less Total Program Costs, Columns (6) - (9).

Overall Environmental Benefit

The OpTerra proposed project will provide the following environmental benefits:



Notes:

1. *The calculator utilized is the Greenhouse Gas Equivalencies Calculator published and maintained by the United States Environmental Protection Agency and could be found at the following website address: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.*

Overall Project Economic Impact

The local economy and community are expected to benefit as shown below:

Notes:

1. *The calculator uses multipliers from RIMS II, from the Bureau from Economic Analysis. RIMS II Multipliers used are from the U.S. Department of Commerce, Bureau of Economic Analysis; "RIMS II input-output multipliers show how local demand shocks affect total gross output, value added, earnings, and employment in the region." https://www.bea.gov/regional/rims/rimsii/*

2. *"Jobs" refers to average annual Full Time Equivalents (FTEs) i.e. if 2 part-time jobs are created, the model calculates it as 1 job. These job numbers underestimate the impact of job creation as the majority of jobs created since 2008 have been part-time and temporary jobs. So, it is reasonable to estimate that 2 - 3X the number of individuals will be impacted by the job creation shown. - Martha Amram, MIT PhD economist*

Conclusion

OpTerra believes this Investment Grade Audit Report presents an actionable solution that meet the County's long-term goals and ambitions. From energy conservation and renewable energy generation, this program will benefit the County in many ways. For example, over 13,600 tons of CO2 will be eliminated from the atmosphere and local economic growth will be stimulated over the twenty-year project term; Further, the program will support the County's goal of replacing a significant amount of HVAC equipment included in the current 5-year CIP and also improve upon existing community-wide STEM education engagement through such avenues as *Broward Sustainability Stewards*, Broward County Schools, and "internal" Broward County employee education.

We would like to extend our most sincere thanks and appreciation to all County and Utility staff who provided friendly, helpful, and professional assistance during our audit. The success of this program depends on a respectful environment of shared thoughts, experiences, and knowledge, and we believe that success is achieved through openness and willingness to share information. We value our long-standing relationship with Broward County, and look forward to strengthening our partnership as we continue to support the County's sustainability goals, energy awareness, and fiscally responsibility.

Thank you for your time and consideration, as well as the opportunity to further serve you - our valued customer. It has been a pleasure.

Project General Notes/Exclusions:

- The implementation costs shown are based on current material costs, labor costs, and current codes enforced at the time of submission (January 2018). This price will be valid for six months (except Solar as detailed in the Solar ECM Description). Thereafter, OpTerra has the right to increase the implementation cost if market conditions change.
- Broward County has not provided OpTerra with current asbestos reports for any of the included buildings. OpTerra has not included abatement services, of any type, in this project. If Asbestos Containing Materials (ACMs) are found during engineering design or implementation, OpTerra will notify Broward County immediately. If construction is in progress, OpTerra will stop work on effected areas immediately. OpTerra will aid the County in determining a feasible solution; however, the cost to abate ACMs will be the County's responsibility.
- The project includes a minimum of 10% CBE participation.

2. Energy Conservation Measure Opportunities

This section of the report provides a brief description of the Energy Conservation Measures (ECMs) identified during the Investment Grade Audit. This section is broken into the following ECM groupings for easier review by the County:

- Controls
- Mechanical/Electrical
- Lighting
- Water
- Building Envelope
- Solar
- Other

As part of the Preliminary Energy Performance Report that was submitted by OpTerra, various energy conservation measures (ECMs) were evaluated for the Broward County Energy Savings Performance Contracting project. These ECMs were further evaluated in the Investment Grade Audit (IGA). Additionally, Broward County requested that OpTerra analyze new ECMs inspired by deferred maintenance or planned Capital Improvement Project. Scopes of work were developed for each ECM which were utilized to establish accurate construction cost estimates and to determine the projected energy savings generated by the ECM.

BASELINE MODELING

Opterra used a combination of methods to establish the baseline energy usage for this project, depending on the available data and Measurement and Verification (M&V) options selected for the various sites. We have compared our modeling results to the actual utility data, weather data, and occupancy statistics, then made fine adjustments to the modeling input as necessary to calibrate our models to actual building consumption.

As the facility conditions change throughout the program life, and they almost always do, the baseline will be adjusted accordingly. Factors necessitating a baseline adjustment include occupancy time changes, facility use changes, HVAC operation and set point changes, and equipment modifications to name a few. Factors such as occupancy data, operation schedules, and facility use changes will be re-entered into the modeling program to determine the baseline adjustment. All data and modeling results will be reviewed with the County staff.

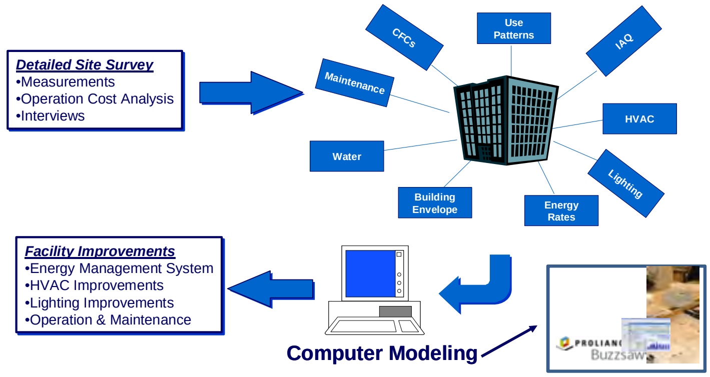
The baseline energy use profile is defined as the monthly and annual usage of each energy source used at the building that is indicative of usage with current equipment, occupancy and operational methodology.

In determining a baseline, OpTerra has:

1. Analyzed energy usage records for the most recent three years; where available, OpTerra took into account any changes in facility equipment and operations that would alter the usage during that three-year period.

2. Developed a thorough understanding of the programmatic activities conducted in each building, as well as an understanding of the electrical and mechanical equipment operating patterns.
3. Develop an energy and water-usage computer simulation model for the facility that is calibrated using actual data.

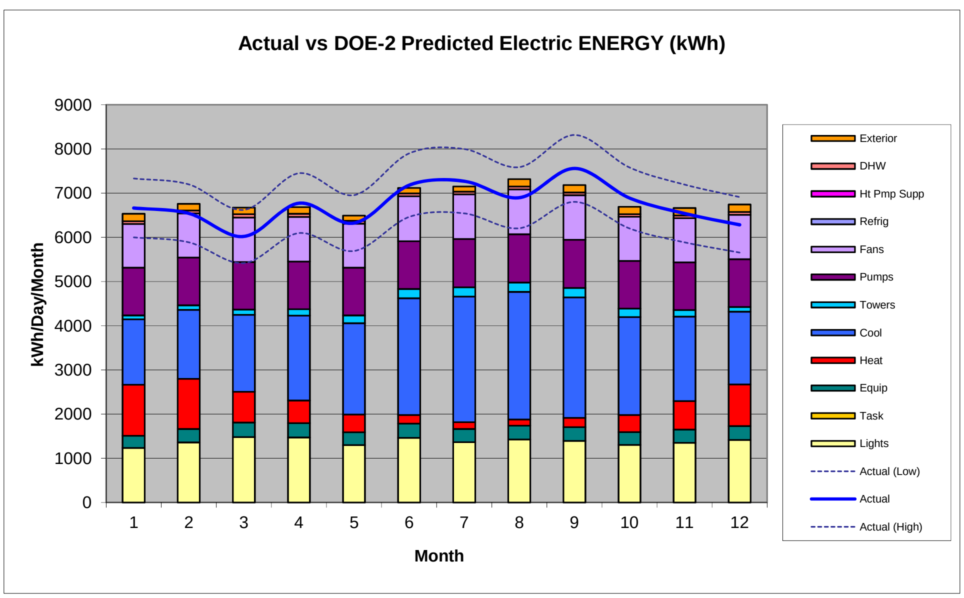
Computerized Modeling Program



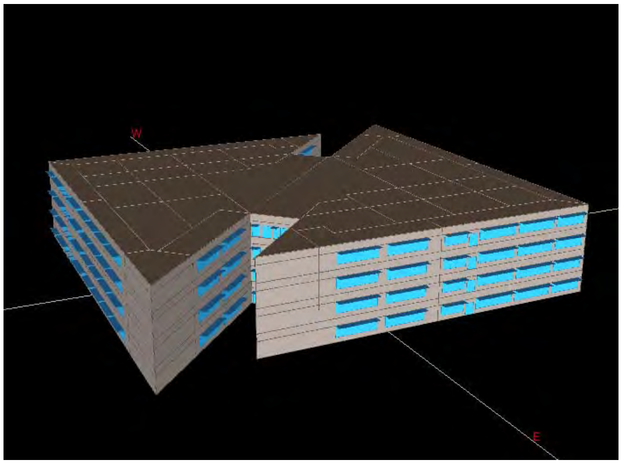
This data collected from Items 1 and 2 was then used to rebuild the facility as a computer energy model. Definitions of building shape, size, construction, occupancy, lighting, temperatures, schedules, controls, plug load, weather locale and other details are used to create the model. The computer then simulates the energy use of the facility for a year taking into account the changing effects of weather, schedule variances, etc. To verify the accuracy of the model, the simulated energy usage is compared and calibrated to the history of monthly energy bills for the facility over a three-year period. The calibrated model then becomes the "baseline".

Example Baseline Calibration Output

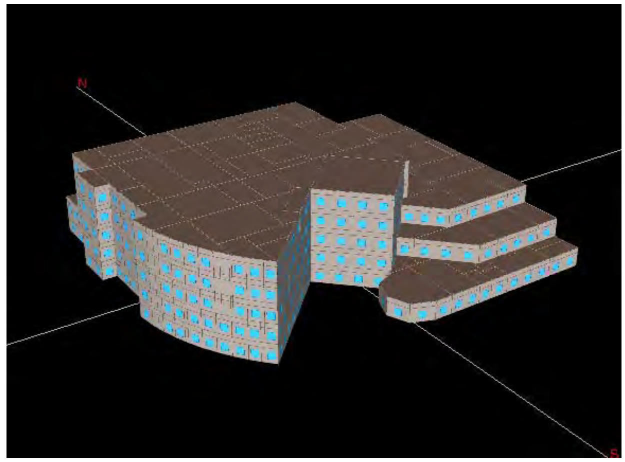
North Regional Courthouse: Actual (Solid Blue Line) vs Modeled (Columns)



All viable ECMs are then put in to the model and simulated over a full year of to determine their energy savings. "Packages" of ECMs are evaluated in the model to observe the interactive effects of the measures. For example, the effects on savings generated by implementing lighting, HVAC and controls measures as a package.



Government Center West Model



Public Safety Building Model

Spreadsheet Calculations

An alternate method utilized for calculating energy and water savings was modeling of the individual ECMs with spreadsheets utilizing bin weather data, annual load variation, equipment energy use, and schedule parameters. The savings were calculated as the difference between existing equipment definition (efficiencies, full load energy use and capacities, part-load profiles, and operating schedule) and proposed equipment modification or replacement.

The type of calculation described above is very accurate for well-defined ECMs. For instance, water consumption savings for domestic water retrofits were determined by individually subtracting the rated water flow of the retrofit from the existing fixture water flow. Field measurements as well as manufacturer and industry ratings were used.

Determination of Calculation Methodology

Based upon the ECMs identified and the level of complexity and interaction of the ECMs, the mathematical models may consist of spreadsheet calculations, while others will require a building simulation software to be utilized. The buildings in which OpTerra utilized baseline modeling whole building energy simulation software packages are:

- Public Safety Building
- African American Library
- North Regional Courthouse
- Government Center West
- Hallandale Library
- Stirling Road Library
- Dan Pearl Library
- Sexual Assault Treatment Center

Table 2-1 on the following page presents a summary of included ECMs, by building. Table 2-2 details ECMs that were evaluated; however, they did not meet the payback criteria set by Broward County. Following Table 2-2 are the financial details and descriptions for each ECM, which includes an explanation of the existing system operations and how these systems can be modified or replaced to provide more efficient and reliable operation.

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

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TABLE 2-1

INCLUDED ENERGY CONSERVATION MEASURES

PARKS

	Measures	CD Regional	Topeekeegee Yugnee	Easterlin	Tree Tops	Long Key	West Lake/Anne Kolb NC	Brian Piccolo	Fern Forest	Plantation Heritage	Secret Woods	Hollywood North Beach	Saw Palmetto
	CONTROLS												
C1	Install New BAS												
C2	Energy Efficiency Upgrades to Existing BAS												
C3	System Check-Out of Existing BAS												
C4	Install Networkable Programmable Thermostats												
C5	Window Air Conditioner Controller												
C6	Variable Volume Control of Single Zone AHUs												
C7	Variable Flow CHW Pumping												
C8	Decouple Exhaust Fan and Lighting Control												
C9	Variable Volume Exhaust Fans												
C10	Reconfigure Cooling Tower Control												
C11	Optimize HVAC Schedules and Set Points						X						
C12	Reprogram Control of Outside Air Damper												
	MECHANICAL												
M1	Install New Chiller												
M1(A)	Install New Chiller (VSD Option)												
M2	Cooling Tower Replacement												
M3	Chilled Water Pump Replacement												
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)		X			X	X		X				
M5	Replace R-22 Rooftop Unit (RTU)					X			X				
M6	Straighten Condensing Unit Fins												
M7	CHW Coil Cleaning												
M8	Install New AHU												
M9	Replace Existing DHW Heater with Instantaneous Electric Heater												
M10	Install New Outside Air Damper												
M11	Install VFD on Supply Fan												
M12	Repair Smoke Damper Leakage						X						
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms												
M14	Chilled Water Pipe Insulation												
M15	Replace Leibert Rooftop Condensing Units												
M16	Replace Air Compressor												
M17	Install Fiberglass Insulation above Ceiling Tile												
M18	Replace VAV Boxes & Controllers												
M19	CHW Pump Replacement												
	LIGHTING												
L1	Interior Lighting Upgrade	X	X	X	X	X	X	X	X	X	X		
L2	Exterior and Site Lighting Upgrade	X	X	X	X	X	X	X	X	X	X		
L3	Sports Field Lighting Upgrade												
	WATER												
W1	Plumbing Fixture Upgrades			X	X	X						X	
W2	Install Refrigeration Line Heat Exchanger on Ice Machines	X				X							
W3	Central Control Weather Based Irrigation	X											
W4	Cooling Tower Low Blowdown												
	BUILDING ENVELOPE												
B1	Seal Building Envelope	X	X	X	X	X		X	X	X	X	X	
	SOLAR												
S1	Install Solar PV Rooftop System												
S2	Install Solar PV Parking Canopies												
	OTHER												
O1	Surge Protection						X						
O2	Submeter RV Camping Spaces												

LIBRARIES

	Measures	African American	SW Regional	West Regional	Northwest Regional	Weston	Lauderdale Lakes	Stirling Road	North Lauderdale	Dan Pearl	Margate	Hallandale	Century Plaza	Dania Beach	Carver Ranches	Pompano Beach
	CONTROLS															
C1	Install New BAS							X								
C2	Energy Efficiency Upgrades to Existing BAS	X								X						
C3	System Check-Out of Existing BAS	X		X	X	X					X					
C4	Install Networkable Programmable Thermostats															
C5	Window Air Conditioner Controller															
C6	Variable Volume Control of Single Zone AHUs															
C7	Variable Flow CHW Pumping															
C8	Decouple Exhaust Fan and Lighting Control															
C9	Variable Volume Exhaust Fans															
C10	Reconfigure Cooling Tower Control															
C11	Optimize HVAC Schedules and Set Points	X		X	X	X	X			X	X				X	X
C12	Reprogram Control of Outside Air Damper															
	MECHANICAL															
M1	Install New Chiller				X						X					
M1(A)	Install New Chiller (VSD Option)															
M2	Cooling Tower Replacement															
M3	Chilled Water Pump Replacement															
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)				X	X			X			X			X	
M5	Replace R-22 Rooftop Unit (RTU)														X	
M6	Straighten Condensing Unit Fins															
M7	CHW Coil Cleaning				X											
M8	Install New AHU															
M9	Replace Existing DHW Heater with Instantaneous Electric Heater															
M10	Install New Outside Air Damper															
M11	Install VFD on Supply Fan															
M12	Repair Smoke Damper Leakage															
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms															
M14	Chilled Water Pipe Insulation															
M15	Replace Leibert Rooftop Condensing Units															
M16	Replace Air Compressor															
M17	Install Fiberglass Insulation above Ceiling Tile															
M18	Replace VAV Boxes & Controllers															
M19	CHW Pump Replacement															
	LIGHTING															
L1	Interior Lighting Upgrade	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L2	Exterior and Site Lighting Upgrade	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L3	Sports Field Lighting Upgrade															
	WATER															
W1	Plumbing Fixture Upgrades								X		X	X	X		X	X
W2	Install Refrigeration Line Heat Exchanger on Ice Machines															
W3	Central Control Weather Based Irrigation															
W4	Cooling Tower Low Blowdown															
	BUILDING ENVELOPE															
B1	Seal Building Envelope	X														
	SOLAR															
S1	Install Solar PV Rooftop System			X	X	X										
S2	Install Solar PV Parking Canopies															
	OTHER															
O1	Surge Protection															
O2	Submeter RV Camping Spaces															

OFFICE & COURTHOUSE

	Measures	Public Safety Complex - Public Safety Building	Public Safety Complex - Logistics Warehouse	Public Safety Complex - Tactical Training Building	Public Safety Complex - Central Supply Building	Public Safety Complex - BSO District 5 Office	North Regional Courthouse	Government Center West	TRAF ENG Administration North	Park Administration Complex	INTEG WAST South Landfill
	CONTROLS										
C1	Install New BAS	X	X	X	X	X					
C2	Energy Efficiency Upgrades to Existing BAS										
C3	System Check-Out of Existing BAS							X			
C4	Install Networkable Programmable Thermostats										
C5	Window Air Conditioner Controller										
C6	Variable Volume Control of Single Zone AHUs										
C7	Variable Flow CHW Pumping										
C8	Decouple Exhaust Fan and Lighting Control										
C9	Variable Volume Exhaust Fans										
C10	Reconfigure Cooling Tower Control										
C11	Optimize HVAC Schedules and Set Points						X	X			
C12	Reprogram Control of Outside Air Damper										
	MECHANICAL										
M1	Install New Chiller						X				
M1(A)	Install New Chiller (VSD Option)										
M2	Cooling Tower Replacement										
M3	Chilled Water Pump Replacement										
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)				X						
M5	Replace R-22 Rooftop Unit (RTU)	X									
M6	Straighten Condensing Unit Fins										
M7	CHW Coil Cleaning										
M8	Install New AHU						X				
M9	Replace Existing DHW Heater with Instantaneous Electric Heater										
M10	Install New Outside Air Damper										
M11	Install VFD on Supply Fan										
M12	Repair Smoke Damper Leakage	X									
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms	X									
M14	Chilled Water Pipe Insulation										
M15	Replace Leibert Rooftop Condensing Units										
M16	Replace Air Compressor										
M17	Install Fiberglass Insulation above Ceiling Tile										
M18	Replace VAV Boxes & Controllers										
M19	CHW Pump Replacement										
	LIGHTING										
L1	Interior Lighting Upgrade	X	X	X	X	X	X	X	X	X	X
L2	Exterior and Site Lighting Upgrade	X	X	X	X	X	X	X	X	X	X
L3	Sports Field Lighting Upgrade										
	WATER										
W1	Plumbing Fixture Upgrades	X					X	X	X	X	
W2	Install Refrigeration Line Heat Exchanger on Ice Machines										
W3	Central Control Weather Based Irrigation	X					X				
W4	Cooling Tower Low Blowdown	X									
	BUILDING ENVELOPE										
B1	Seal Building Envelope							X			X
	SOLAR										
S1	Install Solar PV Rooftop System			X			X	X	X		
S2	Install Solar PV Parking Canopies										
	OTHER										
O1	Surge Protection										
O2	Submeter RV Camping Spaces										

HEALTH AND LAB

	Measures	Central Homeless Assistance Center	Booher Building	North Homeless Assistance Center	Family Success Center	Sexual Assault Treatment Center	EPD Environmental Monitoring Facility	EAP Our House
	CONTROLS							
C1	Install New BAS							
C2	Energy Efficiency Upgrades to Existing BAS							
C3	System Check-Out of Existing BAS							
C4	Install Networkable Programmable Thermostats							
C5	Window Air Conditioner Controller							
C6	Variable Volume Control of Single Zone AHUs							
C7	Variable Flow CHW Pumping							
C8	Decouple Exhaust Fan and Lighting Control							
C9	Variable Volume Exhaust Fans							
C10	Reconfigure Cooling Tower Control							
C11	Optimize HVAC Schedules and Set Points							
C12	Reprogram Control of Outside Air Damper							
	MECHANICAL							
M1	Install New Chiller							
M1(A)	Install New Chiller (VSD Option)							
M2	Cooling Tower Replacement							
M3	Chilled Water Pump Replacement							
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)					X		X
M5	Replace R-22 Rooftop Unit (RTU)		X		X			
M6	Straighten Condensing Unit Fins							
M7	CHW Coil Cleaning							
M8	Install New AHU							
M9	Replace Existing DHW Heater with Instantaneous Electric Heater							
M10	Install New Outside Air Damper							
M11	Install VFD on Supply Fan							
M12	Repair Smoke Damper Leakage							
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms							
M14	Chilled Water Pipe Insulation							
M15	Replace Leibert Rooftop Condensing Units							
M16	Replace Air Compressor							
M17	Install Fiberglass Insulation above Ceiling Tile							
M18	Replace VAV Boxes & Controllers							
M19	CHW Pump Replacement							
	LIGHTING							
L1	Interior Lighting Upgrade	X	X	X	X	X	X	X
L2	Exterior and Site Lighting Upgrade	X	X	X	X	X	X	X
L3	Sports Field Lighting Upgrade							
	WATER							
W1	Plumbing Fixture Upgrades		X				X	X
W2	Install Refrigeration Line Heat Exchanger on Ice Machines							
W3	Central Control Weather Based Irrigation						X	
W4	Cooling Tower Low Blowdown							
	BUILDING ENVELOPE							
B1	Seal Building Envelope							X
	SOLAR							
S1	Install Solar PV Rooftop System				X			
S2	Install Solar PV Parking Canopies							
	OTHER							
O1	Surge Protection							
O2	Submeter RV Camping Spaces							

PARKING, WAREHOUSE, & REPAIR

	Measures	MASS TRAN, North Maintenance	BSO Maintenance Facility	BCJC South Parking Garage	HIGH & BRDG Mosquito Control	South Maintenance Shop	MASS Tran Northeast Terminal
	CONTROLS						
C1	Install New BAS						
C2	Energy Efficiency Upgrades to Existing BAS						
C3	System Check-Out of Existing BAS						
C4	Install Networkable Programmable Thermostats						
C5	Window Air Conditioner Controller						
C6	Variable Volume Control of Single Zone AHUs						
C7	Variable Flow CHW Pumping						
C8	Decouple Exhaust Fan and Lighting Control						
C9	Variable Volume Exhaust Fans						
C10	Reconfigure Cooling Tower Control						
C11	Optimize HVAC Schedules and Set Points						
C12	Reprogram Control of Outside Air Damper						
	MECHANICAL						
M1	Install New Chiller						
M1(A)	Install New Chiller (VSD Option)						
M2	Cooling Tower Replacement						
M3	Chilled Water Pump Replacement						
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)	X			X	X	
M5	Replace R-22 Rooftop Unit (RTU)						
M6	Straighten Condensing Unit Fins						
M7	CHW Coil Cleaning						
M8	Install New AHU						
M9	Replace Existing DHW Heater with Instantaneous Electric Heater						
M10	Install New Outside Air Damper						
M11	Install VFD on Supply Fan						
M12	Repair Smoke Damper Leakage						
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms						
M14	Chilled Water Pipe Insulation						
M15	Replace Leibert Rooftop Condensing Units						
M16	Replace Air Compressor						
M17	Install Fiberglass Insulation above Ceiling Tile						
M18	Replace VAV Boxes & Controllers						
M19	CHW Pump Replacement						
	LIGHTING						
L1	Interior Lighting Upgrade	X	X	X	X	X	X
L2	Exterior and Site Lighting Upgrade	X	X	X	X	X	X
L3	Sports Field Lighting Upgrade						
	WATER						
W1	Plumbing Fixture Upgrades				X		
W2	Install Refrigeration Line Heat Exchanger on Ice Machines						
W3	Central Control Weather Based Irrigation						
W4	Cooling Tower Low Blowdown						
	BUILDING ENVELOPE						
B1	Seal Building Envelope		X	X		X	
	SOLAR						
S1	Install Solar PV Rooftop System	X		X			
S2	Install Solar PV Parking Canopies						
	OTHER						
O1	Surge Protection						
O2	Submeter RV Camping Spaces						

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

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TABLE 2-2

EVALUATED, NOT INCLUDED, ENERGY CONSERVATION MEASURES

PARKS

	Measures	CD Regional	Topeekeegee Yugnee	Easterlin	Tree Tops	Long Key	West Lake/Anne Kolb NC	Brian Piccolo	Fern Forest	Plantation Heritage	Secret Woods	Hollywood North Beach	Saw Palmetto
	CONTROLS												
C1	Install New BAS												
C2	Energy Efficiency Upgrades to Existing BAS												
C3	System Check-Out of Existing BAS												
C4	Install Networkable Programmable Thermostats		N			N	N	N	N				
C5	Window Air Conditioner Controller												
C6	Variable Volume Control of Single Zone AHUs												
C7	Variable Flow CHW Pumping												
C8	Decouple Exhaust Fan and Lighting Control												
C9	Variable Volume Exhaust Fans												
C10	Reconfigure Cooling Tower Control												
C11	Optimize HVAC Schedules and Set Points			N									
C12	Reprogram Control of Outside Air Damper												
	MECHANICAL												
M1	Install New Chiller	N											
M1(A)	Install New Chiller (VSD Option)												
M2	Cooling Tower Replacement												
M3	Chilled Water Pump Replacement												
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)												
M5	Replace R-22 Rooftop Unit (RTU)												
M6	Straighten Condensing Unit Fins												
M7	CHW Coil Cleaning												
M8	Install New AHU												
M9	Replace Existing DHW Heater with Instantaneous Electric Heater												
M10	Install New Outside Air Damper												
M11	Install VFD on Supply Fan					N							
M12	Repair Smoke Damper Leakage												
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms												
M14	Chilled Water Pipe Insulation												
M15	Replace Leibert Rooftop Condensing Units												
M16	Replace Air Compressor												
M17	Install Fiberglass Insulation above Ceiling Tile												
M18	Replace VAV Boxes & Controllers												
M19	CHW Pump Replacement												
	LIGHTING												
L1	Interior Lighting Upgrade											N	
L2	Exterior and Site Lighting Upgrade											N	
L3	Sports Field Lighting Upgrade	N						N					
	WATER												
W1	Plumbing Fixture Upgrades	N	N				N	N		N	N		
W2	Install Refrigeration Line Heat Exchanger on Ice Machines			N									
W3	Central Control Weather Based Irrigation												
W4	Cooling Tower Sewer Deduct Meter												
W5	Cooling Tower Low Blowdown												
	BUILDING ENVELOPE												
B1	Seal Building Envelope						N						
	SOLAR												
S1	Install Solar PV Rooftop System												
S2	Install Solar PV Parking Canopies												
	OTHER												
O1	Surge Protection												
O2	Submeter RV Camping Spaces												

LIBRARIES

	Measures	African American	SW Regional	West Regional	Northwest Regional	Weston	Lauderdale Lakes	Stirling Road	North Lauderdale	Dan Pearl	Margate	Hallandale	Century Plaza	Dania Beach	Carver Ranches	Pompano Beach
	CONTROLS															
C1	Install New BAS															
C2	Energy Efficiency Upgrades to Existing BAS		N	N										N		N
C3	System Check-Out of Existing BAS		N				N		N							
C4	Install Networkable Programmable Thermostats											N	N		N	
C5	Window Air Conditioner Controller															
C6	Variable Volume Control of Single Zone AHUs	N										N				
C7	Variable Flow CHW Pumping															
C8	Decouple Exhaust Fan and Lighting Control											N				
C9	Variable Volume Exhaust Fans															
C10	Reconfigure Cooling Tower Control															
C11	Optimize HVAC Schedules and Set Points		N					N	N					N		
C12	Reprogram Control of Outside Air Damper															
	MECHANICAL															
M1	Install New Chiller			N												N
M1(A)	Install New Chiller (VSD Option)			N												
M2	Cooling Tower Replacement			N												
M3	Chilled Water Pump Replacement	N														
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)									N						
M5	Replace R-22 Rooftop Unit (RTU)															
M6	Straighten Condensing Unit Fins															
M7	CHW Coil Cleaning	N	N													
M8	Install New AHU								N	N	N					
M9	Replace Existing DHW Heater with Instantaneous Electric Heater															
M10	Install New Outside Air Damper	N														
M11	Install VFD on Supply Fan															
M12	Repair Smoke Damper Leakage															
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms															
M14	Chilled Water Pipe Insulation															
M15	Replace Leibert Rooftop Condensing Units															
M16	Replace Air Compressor															
M17	Install Fiberglass Insulation above Ceiling Tile															
M18	Replace VAV Boxes & Controllers		N													
M19	CHW Pump Replacement				N											
	LIGHTING															
L1	Interior Lighting Upgrade															
L2	Exterior and Site Lighting Upgrade															
L3	Sports Field Lighting Upgrade															
	WATER															
W1	Plumbing Fixture Upgrades	N	N	N	N	N	N	N		N				N		
W2	Install Refrigeration Line Heat Exchanger on Ice Machines															
W3	Central Control Weather Based Irrigation															
W4	Cooling Tower Sewer Deduct Meter															
W5	Cooling Tower Low Blowdown			N												
	BUILDING ENVELOPE															
B1	Seal Building Envelope		N	N	N	N	N	N	N	N	N	N	N	N	N	N
	SOLAR															
S1	Install Solar PV Rooftop System															
S2	Install Solar PV Parking Canopies															
	OTHER															
O1	Surge Protection															
O2	Submeter RV Camping Spaces															

OFFICE & COURTHOUSE

	Measures	Public Safety Complex - Public Safety Building	Public Safety Complex - Logistics Warehouse	Public Safety Complex - Tactical Training Building	Public Safety Complex - Central Supply Building	Public Safety Complex - BSO District 5 Office	North Regional Courthouse	Government Center West	TRAF ENG Administration North	Park Administration Complex	INTEG WAST South Landfill
	CONTROLS										
C1	Install New BAS										
C2	Energy Efficiency Upgrades to Existing BAS						N				
C3	System Check-Out of Existing BAS	N									
C4	Install Networkable Programmable Thermostats									N	
C5	Window Air Conditioner Controller										
C6	Variable Volume Control of Single Zone AHUs										
C7	Variable Flow CHW Pumping	N					N	N			
C8	Decouple Exhaust Fan and Lighting Control										
C9	Variable Volume Exhaust Fans										
C10	Reconfigure Cooling Tower Control										
C11	Optimize HVAC Schedules and Set Points										
C12	Reprogram Control of Outside Air Damper										
	MECHANICAL										
M1	Install New Chiller	N									
M1(A)	Install New Chiller (VSD Option)	N					N				
M2	Cooling Tower Replacement										
M3	Chilled Water Pump Replacement	N					N				
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)		N	N							
M5	Replace R-22 Rooftop Unit (RTU)			N							
M6	Straighten Condensing Unit Fins										
M7	CHW Coil Cleaning										
M8	Install New AHU	N	N		N			N			
M9	Replace Existing DHW Heater with Instantaneous Electric Heater										
M10	Install New Outside Air Damper										
M11	Install VFD on Supply Fan										
M12	Repair Smoke Damper Leakage										
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms										
M14	Chilled Water Pipe Insulation										
M15	Replace Leibert Rooftop Condensing Units	N									
M16	Replace Air Compressor										
M17	Install Fiberglass Insulation above Ceiling Tile										
M18	Replace VAV Boxes & Controllers										
M19	CHW Pump Replacement										
	LIGHTING										
L1	Interior Lighting Upgrade										
L2	Exterior and Site Lighting Upgrade										
L3	Sports Field Lighting Upgrade										
	WATER										
W1	Plumbing Fixture Upgrades										N
W2	Install Refrigeration Line Heat Exchanger on Ice Machines									N	
W3	Central Control Weather Based Irrigation										
W4	Cooling Tower Sewer Deduct Meter										
W5	Cooling Tower Low Blowdown	N					N	N			
	BUILDING ENVELOPE										
B1	Seal Building Envelope	N					N		N	N	
	SOLAR										
S1	Install Solar PV Rooftop System										
S2	Install Solar PV Parking Canopies										
	OTHER										
O1	Surge Protection										
O2	Submeter RV Camping Spaces										

HEALTH AND LAB

	Measures	Central Homeless Assistance Center	Booher Building	North Homeless Assistance Center	Family Success Center	Sexual Assault Treatment Center	EPD Environmental Monitoring Facility	EAP Our House
	CONTROLS							
C1	Install New BAS							
C2	Energy Efficiency Upgrades to Existing BAS							
C3	System Check-Out of Existing BAS							
C4	Install Networkable Programmable Thermostats		N		N	N		N
C5	Window Air Conditioner Controller							
C6	Variable Volume Control of Single Zone AHUs							
C7	Variable Flow CHW Pumping							
C8	Decouple Exhaust Fan and Lighting Control							
C9	Variable Volume Exhaust Fans					N		
C10	Reconfigure Cooling Tower Control							
C11	Optimize HVAC Schedules and Set Points							
C12	Reprogram Control of Outside Air Damper							
	MECHANICAL							
M1	Install New Chiller							
M1(A)	Install New Chiller (VSD Option)							
M2	Cooling Tower Replacement							
M3	Chilled Water Pump Replacement							
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)							
M5	Replace R-22 Rooftop Unit (RTU)							
M6	Straighten Condensing Unit Fins							
M7	CHW Coil Cleaning							
M8	Install New AHU							
M9	Replace Existing DHW Heater with Instantaneous Electric Heater							
M10	Install New Outside Air Damper							
M11	Install VFD on Supply Fan							
M12	Repair Smoke Damper Leakage							
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms							
M14	Chilled Water Pipe Insulation							
M15	Replace Leibert Rooftop Condensing Units							
M16	Replace Air Compressor		N					
M17	Install Fiberglass Insulation above Ceiling Tile							
M18	Replace VAV Boxes & Controllers							
M19	CHW Pump Replacement							
	LIGHTING							
L1	Interior Lighting Upgrade							
L2	Exterior and Site Lighting Upgrade							
L3	Sports Field Lighting Upgrade							
	WATER							
W1	Plumbing Fixture Upgrades	N		N	N	N		N
W2	Install Refrigeration Line Heat Exchanger on Ice Machines	N		N				
W3	Central Control Weather Based Irrigation			N				
W4	Cooling Tower Sewer Deduct Meter							
W5	Cooling Tower Low Blowdown							
	BUILDING ENVELOPE							
B1	Seal Building Envelope	N	N	N	N	N	N	
	SOLAR							
S1	Install Solar PV Rooftop System							
S2	Install Solar PV Parking Canopies							
	OTHER							
O1	Surge Protection							
O2	Submeter RV Camping Spaces							

PARKING, WAREHOUSE, & REPAIR

	Measures	MASS TRAN, North Maintenance	BSO Maintenance Facility	BCJC South Parking Garage	HIGH & BRDG Mosquito Control	South Maintenance Shop	MASS Tran Northeast Terminal
	CONTROLS						
C1	Install New BAS						
C2	Energy Efficiency Upgrades to Existing BAS						
C3	System Check-Out of Existing BAS						
C4	Install Networkable Programmable Thermostats	N	N		N	N	
C5	Window Air Conditioner Controller						
C6	Variable Volume Control of Single Zone AHUs						
C7	Variable Flow CHW Pumping						
C8	Decouple Exhaust Fan and Lighting Control						
C9	Variable Volume Exhaust Fans						
C10	Reconfigure Cooling Tower Control						
C11	Optimize HVAC Schedules and Set Points			N			
C12	Reprogram Control of Outside Air Damper						
	MECHANICAL						
M1	Install New Chiller						
M1(A)	Install New Chiller (VSD Option)						
M2	Cooling Tower Replacement						
M3	Chilled Water Pump Replacement						
M4	Replace R-22 Split System (Evap Coil & Condensing Unit Only)						
M5	Replace R-22 Rooftop Unit (RTU)						
M6	Straighten Condensing Unit Fins						
M7	CHW Coil Cleaning						
M8	Install New AHU						
M9	Replace Existing DHW Heater with Instantaneous Electric Heater						
M10	Install New Outside Air Damper						
M11	Install VFD on Supply Fan						
M12	Repair Smoke Damper Leakage						
M13	Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms						
M14	Chilled Water Pipe Insulation						
M15	Replace Leibert Rooftop Condensing Units						
M16	Replace Air Compressor						
M17	Install Fiberglass Insulation above Ceiling Tile					N	
M18	Replace VAV Boxes & Controllers						
M19	CHW Pump Replacement						
	LIGHTING						
L1	Interior Lighting Upgrade						
L2	Exterior and Site Lighting Upgrade						
L3	Sports Field Lighting Upgrade						
	WATER						
W1	Plumbing Fixture Upgrades	N	N			N	N
W2	Install Refrigeration Line Heat Exchanger on Ice Machines						
W3	Central Control Weather Based Irrigation						
W4	Cooling Tower Sewer Deduct Meter						
W5	Cooling Tower Low Blowdown						
	BUILDING ENVELOPE						
B1	Seal Building Envelope	N			N		N
	SOLAR						
S1	Install Solar PV Rooftop System						
S2	Install Solar PV Parking Canopies						
	OTHER						
O1	Surge Protection						
O2	Submeter RV Camping Spaces						

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TABLE 2-3

Comprehensive Summary of Energy Conservation Measures
By Building Category

Energy Conservation Measures	Project Cost ($)	Cummulative Demand Savings (kW)	Electric Consumption Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
All Sites											
Parks	$1,942,910	0.0	825,254	$94,025	0	$0	433	$3,720	$97,745	$20,308	$118,053
Libraries	$5,914,957	5,197.6	3,677,506	$273,443	0	$0	250	$2,148	$275,591	$58,167	$333,758
Offices & Courthouses	$17,430,883	4,552.6	8,574,789	$471,983	0	$0	6,479	$52,192	$524,175	$61,843	$586,018
Health & Labs	$1,534,059	978.6	594,216	$45,660	0	$0	582	$4,999	$50,659	$17,105	$67,764
Parking, Warehouse & Repair	$4,059,998	2,645.4	2,986,344	$215,767	0	$0	90	$773	$216,540	$18,226	$234,766
County Totals	$30,882,807	13,374.2	16,658,109	$1,100,878	0	$0	7,834	$63,832	$1,164,710	$175,649	$1,340,359

TABLE 2-4

Comprehensive Summary of Energy Conservation Measures
By ECM Category

Energy Conservation Measures	Project Cost ($)	Cummulative Demand Savings (kW)	Electric Consumption Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Controls	$2,886,625	-198.2	2,422,731	$116,160	0	$0	0	$0	$116,160	$0	$116,160
Mechanical	$4,631,085	1,262.6	438,919	$39,468	0	$0	41	$352	$39,820	$12,264	$52,084
Lighting	$7,699,323	10,834.3	6,312,473	$521,225	0	$0	0	$0	$521,225	$159,500	$680,725
Water	$561,570	0.0	71,525	$4,278	0	$0	7,793	$63,480	$67,758	$3,535	$71,293
Building Envelope	$109,689	0.0	121,247	$10,797	0	$0	0	$0	$10,797	$0	$10,797
Solar	$14,991,001	1,475.5	7,291,214	$408,950	0	$0	0	$0	$408,950	$0	$408,950
Other	$3,514	0.0	0	$0	0	$0	0	$0	$0	$350	$350
COUNTY TOTALS	**$30,882,807**	**13,374.2**	**16,658,109**	**$1,100,878**	**0**	**$0**	**7,834**	**$63,832**	**$1,164,710**	**$175,649**	**$1,340,359**

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TABLE 2-5

Comprehensive Summary of Energy Conservation Measures
By Site

Comprehensive List of Energy Conservation Measures
Broward County - Parks

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
CD Regional														
L1 Interior Lighting Upgrade	$143,189	0.0	0.0	63,662	0	0	$7,331	0	$0	0	$0	$7,331	$891	$8,222
L2 Exterior and Site Lighting Upgrade	$346,274	0.0	0.0	230,357	0	0	$26,525	0	$0	0	$0	$26,525	$2,514	$29,039
W2 Install Refrigeration Line Heat Exchanger on Ice Machine	$2,576	0.0	0.0	2,081	0	0	$240	0	$0	0	$0	$240	$0	$240
W3 Central Control Weather Based Irrigation	$16,099	0.0	0.0	0	0	0	$0	0	$0	151	$1,297	$1,297	$75	$1,372
B1 Seal Building Envelope	$8,530	0.0	0.0	8,341	0	0	$960	0	$0	0	$0	$960	$0	$960
CD Regional Totals	$516,668	0.0	0.0	304,441	0	0	$35,056	0	$0	151	$1,297	$36,353	$3,480	$39,833
Topeekeegee Yugnee														
L1 Interior Lighting Upgrade	$147,149	0.0	0.0	73,057	0	0	$8,328	0	$0	0	$0	$8,328	$3,125	$11,453
L2 Exterior and Site Lighting Upgrade	$31,770	0.0	0.0	6,584	0	0	$751	0	$0	0	$0	$751	$299	$1,050
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$100,568	0.0	0.0	9,161	0	0	$1,044	0	$0	0	$0	$1,044	$553	$1,597
B1 Seal Building Envelope	$4,836	0.0	0.0	6,664	0	0	$760	0	$0	0	$0	$760	$0	$760
Topeekeegee Yugnee Totals	$284,323	0.0	0.0	95,466	0	0	$10,883	0	$0	0	$0	$10,883	$3,977	$14,860
Easterlin														
L1 Interior Lighting Upgrade	$15,065	0.0	0.0	1,071	0	0	$152	0	$0	0	$0	$152	$103	$255
L2 Exterior and Site Lighting Upgrade	$7,743	0.0	0.0	9,184	0	0	$1,305	0	$0	0	$0	$1,305	$460	$1,765
W1 Plumbing Fixture Upgrades	$10,830	0.0	0.0	1,721	0	0	$245	0	$0	89	$765	$1,010	$122	$1,132
B1 Seal Building Envelope	$3,215	0.0	0.0	4,025	0	0	$572	0	$0	0	$0	$572	$0	$572
Easterlin Totals	$36,853	0.0	0.0	16,001	0	0	$2,274	0	$0	89	$765	$3,039	$685	$3,724
Tree Tops														
L1 Interior Lighting Upgrade	$56,055	0.0	0.0	22,402	0	0	$2,177	0	$0	0	$0	$2,177	$838	$3,015
L2 Exterior and Site Lighting Upgrade	$76,198	0.0	0.0	28,384	0	0	$2,759	0	$0	0	$0	$2,759	$622	$3,381
W1 Plumbing Fixture Upgrades	$10,890	0.0	0.0	297	0	0	$29	0	$0	75	$644	$673	$105	$778
B1 Seal Building Envelope	$8,409	0.0	0.0	9,023	0	0	$877	0	$0	0	$0	$877	$0	$877
Tree Tops Totals	$151,552	0.0	0.0	60,106	0	0	$5,842	0	$0	75	$644	$6,486	$1,565	$8,051
Long Key														
L1 Interior Lighting Upgrade	$54,296	0.0	0.0	28,836	0	0	$3,701	0	$0	0	$0	$3,701	$1,066	$4,767
L2 Exterior and Site Lighting Upgrade	$28,821	0.0	0.0	18,863	0	0	$2,421	0	$0	0	$0	$2,421	$245	$2,666
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$188,883	0.0	0.0	12,870	0	0	$1,652	0	$0	0	$0	$1,652	$1,256	$2,908
W1 Plumbing Fixture Upgrades	$14,288	0.0	0.0	1,885	0	0	$242	0	$0	93	$799	$1,041	$152	$1,193
W2 Install Refrigeration Line Heat Exchanger on Ice Machine	$1,287	0.0	0.0	1,664	0	0	$214	0	$0	0	$0	$214	$0	$214
B1 Seal Building Envelope	$7,972	0.0	0.0	6,730	0	0	$864	0	$0	0	$0	$864	$0	$864
Long Key Totals	$295,547	0.0	0.0	70,848	0	0	$9,094	0	$0	93	$799	$9,893	$2,719	$12,612
West Lake/Anne Kolb NC														
L1 Interior Lighting Upgrade	$72,744	0.0	0.0	45,003	0	0	$3,938	0	$0	0	$0	$3,938	$2,395	$6,333
L2 Exterior and Site Lighting Upgrade	$36,248	0.0	0.0	46,123	0	0	$4,036	0	$0	0	$0	$4,036	$1,205	$5,241
C11 Optimize HVAC Schedules and Set Points	$16,687	0.0	0.0	7,254	0	0	$635	0	$0	0	$0	$635	$0	$635
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$137,089	0.0	0.0	20,063	0	0	$1,755	0	$0	0	$0	$1,755	$591	$2,346
M12 Repair Smoke Damper Leakage	$2,353	0.0	0.0	260	0	0	$23	0	$0	0	$0	$23	$0	$23
O1 Surge Protection	$3,514	0.0	0.0	0	0	0	$0	0	$0	0	$0	$0	$350	$350
West Lake/Anne Kolb NC Totals	$268,635	0.0	0.0	118,703	0	0	$10,387	0	$0	0	$0	$10,387	$4,541	$14,928

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Brian Piccolo														
L1 Interior Lighting Upgrade	$73,717	0.0	0.0	14,082	0	0	$2,430	0	$0	0	$0	$2,430	$347	$2,777
L2 Exterior and Site Lighting Upgrade	$83,404	0.0	0.0	26,175	0	0	$4,518	0	$0	0	$0	$4,518	$185	$4,703
B1 Seal Building Envelope	$2,939	0.0	0.0	3,440	0	0	$594	0	$0	0	$0	$594	$0	$594
Brian Piccolo Totals	$160,060	0.0	0.0	43,697	0	0	$7,542	0	$0	0	$0	$7,542	$532	$8,074
Fern Forest														
L1 Interior Lighting Upgrade	$17,980	0.0	0.0	8,741	0	0	$945	0	$0	0	$0	$945	$412	$1,357
L2 Exterior and Site Lighting Upgrade	$4,506	0.0	0.0	1,007	0	0	$109	0	$0	0	$0	$109	$128	$237
M5 Replace R-22 Rooftop Unit (RTU)	$81,706	0.0	0.0	4,772	0	0	$516	0	$0	0	$0	$516	$431	$947
B1 Seal Building Envelope	$8,731	0.0	0.0	9,785	0	0	$1,057	0	$0	0	$0	$1,057	$0	$1,057
Fern Forest Totals	$112,923	0.0	0.0	24,305	0	0	$2,627	0	$0	0	$0	$2,627	$971	$3,598
Plantation Heritage														
L1 Interior Lighting Upgrade	$46,440	0.0	0.0	19,809	0	0	$2,240	0	$0	0	$0	$2,240	$637	$2,877
L2 Exterior and Site Lighting Upgrade	$4,753	0.0	0.0	25,062	0	0	$2,835	0	$0	0	$0	$2,835	$420	$3,255
B1 Seal Building Envelope	$4,511	0.0	0.0	8,197	0	0	$927	0	$0	0	$0	$927	$0	$927
Plantation Heritage Totals	$55,704	0.0	0.0	53,068	0	0	$6,002	0	$0	0	$0	$6,002	$1,057	$7,059
Secret Woods						0								
L1 Interior Lighting Upgrade	$32,526	0.0	0.0	21,404	0	0	$2,401	0	$0	0	$0	$2,401	$627	$3,028
L2 Exterior and Site Lighting Upgrade	$13,245	0.0	0.0	8,362	0	0	$938	0	$0	0	$0	$938	$138	$1,076
B1 Seal Building Envelope	$10,020	0.0	0.0	6,656	0	0	$747	0	$0	0	$0	$747	$0	$747
Secret Woods Totals	$55,791	0.0	0.0	36,422	0	0	$4,086	0	$0	0	$0	$4,086	$765	$4,851
Hollywood North Beach														
W1 Plumbing Fixture Upgrades	$3,953	0.0	0.0	1,026	0	0	$108	0	$0	25	$215	$323	$16	$339
B1 Seal Building Envelope	$901	0.0	0.0	1,171	0	0	$124	0	$0	0	$0	$124	$0	$124
Hollywood North Beach Totals	$4,854	0.0	0.0	2,197	0	0	$232	0	$0	25	$215	$447	$16	$463
Parks Totals	**$1,942,910**	**0.0**	**0.0**	**825,254**	**0**	**0**	**$94,025**	**0**	**$0**	**433**	**$3,720**	**$97,745**	**$20,308**	**$118,053**

Summary of Energy Conservation Measures for
Broward County - Parks

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Controls	$16,687	0.0	0.0	7,254	0	0	$635	0	0	0	$0	$635	$0	$635
Mechanical	$510,599	0.0	0.0	47,126	0	0	$4,990	0	0	0	$0	$4,990	$2,831	$7,821
Lighting	$1,292,123	0.0	0.0	698,168	0	0	$79,840	0	0	0	$0	$79,840	$16,657	$96,497
Water	$59,923	0.0	0.0	8,674	0	0	$1,078	0	0	433	$3,720	$4,798	$470	$5,268
Building Envelope	$60,064	0.0	0.0	64,032	0	0	$7,482	0	0	0	$0	$7,482	$0	$7,482
Solar	$0	0.0	0.0	0	0	0	$0	0	0	0	$0	$0	$0	$0
Other	$3,514	0.0	0.0	0	0	0	$0	0	0	0	$0	$0	$350	$350
Total	**$1,942,910**	**0.0**	**0.0**	**825,254**	**0**	**0**	**$94,025**	**0**	**0**	**433**	**$3,720**	**$97,745**	**$20,308**	**$118,053**

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Comprehensive List of Energy Conservation Measures
Broward County - Libraries

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
African American														
L1 Interior Lighting Upgrade	$210,331	432.0	0.0	57,852	95,609	0	$14,377	0	$0	0	$0	$14,377	$4,640	$19,017
L2 Exterior and Site Lighting Upgrade	$46,476	0.0	0.0	0	83,858	0	$3,901	0	$0	0	$0	$3,901	$1,253	$5,154
C2 Energy Efficiency Upgrades to Existing BAS	$21,028	103.3	0.0	17,245	76,378	0	$6,219	0	$0	0	$0	$6,219	$0	$6,219
C3 System Check-Out of Existing BAS	$39,409	23.0	0.0	1,764	1,876	0	$503	0	$0	0	$0	$503	$0	$503
C11 Optimize HVAC Schedules and Set Points	$3,958	196.0	0.0	42,535	146,897	0	$12,732	0	$0	0	$0	$12,732	$0	$12,732
B1 Seal Building Envelope	$12,522	0.0	0.0	2,549	7,457	0	$565	0	$0	0	$0	$565	$0	$565
African American Totals	$333,724	754.3	0.0	121,945	412,075	0	$38,297	0	$0	0	$0	$38,297	$5,893	$44,190
Southwest Regional														
L1 Interior Lighting Upgrade	$243,985	544.9	0.0	203,842	0	0	$18,193	0	$0	0	$0	$18,193	$6,440	$24,633
L2 Exterior and Site Lighting Upgrade	$10,848	0.0	0.0	9,512	0	0	$556	0	$0	0	$0	$556	$98	$654
Southwest Regional Totals	$254,833	544.9	0.0	213,354	0	0	$18,749	0	$0	0	$0	$18,749	$6,538	$25,287
West Regional														
L1 Interior Lighting Upgrade	$260,706	521.6	0.0	171,019	0	0	$16,006	0	$0	0	$0	$16,006	$6,117	$22,123
L2 Exterior and Site Lighting Upgrade	$51,986	0.0	0.0	104,624	0	0	$6,116	0	$0	0	$0	$6,116	$1,185	$7,301
C3 System Check-Out of Existing BAS	$69,596	0.0	0.0	20,462	0	0	$1,196	0	$0	0	$0	$1,196	$0	$1,196
C11 Optimize HVAC Schedules and Set Points	$9,895	0.0	0.0	46,327	0	0	$2,708	0	$0	0	$0	$2,708	$0	$2,708
S1 Install Solar PV Rooftop System	$646,555	109.3	0.0	310,357	0	0	$19,401	0	$0	0	$0	$19,401	$0	$19,401
West Regional Totals	$1,038,738	630.9	0.0	652,789	0	0	$45,427	0	$0	0	$0	$45,427	$7,302	$52,729
Northwest Regional														
L1 Interior Lighting Upgrade	$275,879	584.3	0.0	215,402	0	0	$19,323	0	$0	0	$0	$19,323	$9,747	$29,070
L2 Exterior and Site Lighting Upgrade	$51,574	0.0	0.0	62,361	0	0	$3,645	0	$0	0	$0	$3,645	$711	$4,356
C3 System Check-Out of Existing BAS	$35,141	0.0	0.0	16,526	0	0	$966	0	$0	0	$0	$966	$0	$966
C11 Optimize HVAC Schedules and Set Points	$3,958	0.0	0.0	109,830	0	0	$6,420	0	$0	0	$0	$6,420	$0	$6,420
M1 Install New Chiller	$416,031	277.9	0.0	45,469	0	0	$5,859	0	$0	0	$0	$5,859	$0	$5,859
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$21,867	1.7	0.0	546	0	0	$52	0	$0	0	$0	$52	$84	$136
M7 CHW Coil Cleaning	$23,903	56.3	0.0	22,205	0	0	$1,947	0	$0	0	$0	$1,947	$0	$1,947
S1 Install Solar PV Rooftop System	$836,417	164.4	0.0	416,292	0	0	$26,228	0	$0	0	$0	$26,228	$0	$26,228
Northwest Regional Totals	$1,664,770	1,084.6	0.0	888,631	0	0	$64,440	0	$0	0	$0	$64,440	$10,542	$74,982
Weston														
L1 Interior Lighting Upgrade	$260,739	385.3	0.0	115,057	0	0	$11,164	0	$0	0	$0	$11,164	$6,898	$18,062
L2 Exterior and Site Lighting Upgrade	$18,333	0.0	0.0	22,074	0	0	$1,290	0	$0	0	$0	$1,290	$394	$1,684
C3 System Check-Out of Existing BAS	$43,232	0.0	0.0	20,433	0	0	$1,194	0	$0	0	$0	$1,194	$0	$1,194
C11 Optimize HVAC Schedules and Set Points	$3,958	0.0	0.0	45,090	0	0	$2,636	0	$0	0	$0	$2,636	$0	$2,636
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$18,888	0.0	0.0	132	0	0	$8	0	$0	0	$0	$8	$56	$64
S1 Install Solar PV Rooftop System	$722,751	152.0	0.0	345,827	0	0	$21,966	0	$0	0	$0	$21,966	$0	$21,966
Weston Regional Totals	$1,067,901	537.3	0.0	548,613	0	0	$38,258	0	$0	0	$0	$38,258	$7,348	$45,606

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Lauderdale Lakes														
L1 Interior Lighting Upgrade	$67,888	172.1	0.0	54,828	0	0	$5,188	0	$0	0	$0	$5,188	$1,414	$6,602
L2 Exterior and Site Lighting Upgrade	$14,010	0.0	0.0	23,244	0	0	$1,359	0	$0	0	$0	$1,359	$410	$1,769
C11 Optimize HVAC Schedules and Set Points	$3,958	0.0	0.0	12,685	0	0	$742	0	$0	0	$0	$742	$0	$742
Lauderdale Lakes Totals	$85,856	172.1	0.0	90,757	0	0	$7,289	0	$0	0	$0	$7,289	$1,824	$9,113
Stirling Road														
L1 Interior Lighting Upgrade	$96,363	51.3	102.6	3,051	12,407	24,814	$4,284	0	$0	0	$0	$4,284	$1,386	$5,670
L2 Exterior and Site Lighting Upgrade	$37,532	0.0	0.0	0	11,484	22,968	$1,922	0	$0	0	$0	$1,922	$690	$2,612
C1 Install New BAS	$111,114	34.6	-42.6	2,225	27,182	27,011	$3,211	0	$0	0	$0	$3,211	$0	$3,211
Stirling Road Totals	$245,009	85.9	60.0	5,276	51,073	74,793	$9,417	0	$0	0	$0	$9,417	$2,076	$11,493
North Lauderdale														
L1 Interior Lighting Upgrade	$107,440	279.3	0.0	90,411	0	0	$8,503	0	$0	0	$0	$8,503	$2,565	$11,068
L2 Exterior and Site Lighting Upgrade	$16,369	0.0	0.0	14,526	0	0	$849	0	$0	0	$0	$849	$365	$1,214
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$197,705	7.6	0.0	17,044	0	0	$1,084	0	$0	0	$0	$1,084	$1,688	$2,772
W1 Plumbing Fixture Upgrades	$2,840	0.0	0.0	1,237	0	0	$72	0	$0	54	$464	$536	$44	$580
North Lauderdale Totals	$324,354	286.9	0.0	123,218	0	0	$10,508	0	$0	54	$464	$10,972	$4,662	$15,634
Dan Pearl														
L1 Interior Lighting Upgrade	$119,840	350.0	0.0	93,729	0	0	$9,511	0	$0	0	$0	$9,511	$3,247	$12,758
L2 Exterior and Site Lighting Upgrade	$18,698	0.0	0.0	18,487	0	0	$1,081	0	$0	0	$0	$1,081	$303	$1,384
C2 Energy Efficiency Upgrades to Existing BAS	$9,895	23.2	0.0	5,189	0	0	$571	0	$0	0	$0	$571	$0	$571
C11 Optimize HVAC Schedules and Set Points	$3,958	-49.9	0.0	59,879	0	0	$2,925	0	$0	0	$0	$2,925	$0	$2,925
Dan Pearl Totals	$152,391	323.3	0.0	177,284	0	0	$14,088	0	$0	0	$0	$14,088	$3,550	$17,638
Margate						0								
L1 Interior Lighting Upgrade	$47,199	136.8	0.0	41,894	0	0	$4,025	0	$0	0	$0	$4,025	$1,314	$5,339
L2 Exterior and Site Lighting Upgrade	$13,977	0.0	0.0	13,328	0	0	$779	0	$0	0	$0	$779	$213	$992
C3 System Check-Out of Existing BAS	$20,698	0.0	0.0	6,932	0	0	$405	0	$0	0	$0	$405	$0	$405
C11 Optimize HVAC Schedules and Set Points	$3,736	0.0	0.0	4,113	0	0	$240	0	$0	0	$0	$240	$0	$240
M1 Install New Chiller	$108,471	34.4	0.0	29,884	0	0	$2,143	0	$0	0	$0	$2,143	$0	$2,143
W1 Plumbing Fixture Upgrades	$2,114	0.0	0.0	1,182	0	0	$69	0	$0	26	$223	$292	$7	$299
Margate Totals	$196,195	171.2	0.0	97,333	0	0	$7,661	0	$0	26	$223	$7,884	$1,534	$9,418
Hallandale														
L1 Interior Lighting Upgrade	$46,345	22.4	44.8	1,543	6,275	12,550	$2,043	0	$0	0	$0	$2,043	$807	$2,850
L2 Exterior and Site Lighting Upgrade	$12,437	0.0	0.0	0	4,537	9,074	$759	0	$0	0	$0	$759	$209	$968
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$57,177	11.6	17.5	652	2,260	3,114	$726	0	$0	0	$0	$726	$413	$1,139
W1 Plumbing Fixture Upgrades	$2,321	0.0	0.0	0	389	778	$65	0	$0	25	$215	$280	$10	$290
Hallandale Totals	$118,280	34.0	62.3	2,195	13,461	25,516	$3,593	0	$0	25	$215	$3,808	$1,439	$5,247
Century Plaza														
L1 Interior Lighting Upgrade	$37,950	60.4	0.0	18,088	0	0	$1,753	0	$0	0	$0	$1,753	$413	$2,166
L2 Exterior and Site Lighting Upgrade	$481	0.0	0.0	0	0	0	$0	0	$0	0	$0	$0	$0	$0
W1 Plumbing Fixture Upgrades	$9,762	0.0	0.0	1,128	0	0	$66	0	$0	81	$696	$762	$33	$795
Century Plaza Totals	$48,193	60.4	0.0	19,216	0	0	$1,819	0	$0	81	$696	$2,515	$446	$2,961
Dania Beach														
L1 Interior Lighting Upgrade	$39,390	19.8	39.5	1,340	5,449	10,898	$1,785	0	$0	0	$0	$1,785	$1,261	$3,046
L2 Exterior and Site Lighting Upgrade	$5,254	0.0	0.0	0	1,179	2,358	$197	0	$0	0	$0	$197	$464	$661
Dania Beach Totals	$44,644	19.8	39.5	1,340	6,628	13,256	$1,982	0	$0	0	$0	$1,982	$1,725	$3,707

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Carver Ranches														
L1 Interior Lighting Upgrade	$101,834	183.5	0.0	50,658	0	0	$5,075	0	$0	0	$0	$5,075	$919	$5,994
L2 Exterior and Site Lighting Upgrade	$22,939	0.0	0.0	14,453	0	0	$845	0	$0	0	$0	$845	$238	$1,083
C11 Optimize HVAC Schedules and Set Points	$3,958	0.0	0.0	10,918	0	0	$638	0	$0	0	$0	$638	$0	$638
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$78,295	26.0	0.0	11,435	0	0	$968	0	$0	0	$0	$968	$656	$1,624
M5 Replace R-22 Rooftop Unit (RTU)	$74,996	38.6	0.0	2,777	0	0	$607	0	$0	0	$0	$607	$422	$1,029
W1 Plumbing Fixture Upgrades	$6,261	0.0	0.0	1,055	0	0	$62	0	$0	42	$361	$423	$77	$500
Carver Ranches Totals	$288,283	248.1	0.0	91,296	0	0	$8,195	0	$0	42	$361	$8,556	$2,312	$10,868
NW Pompano Beach														
L1 Interior Lighting Upgrade	$35,763	82.1	0.0	24,118	0	0	$2,356	0	$0	0	$0	$2,356	$769	$3,125
L2 Exterior and Site Lighting Upgrade	$11,899	0.0	0.0	15,695	0	0	$917	0	$0	0	$0	$917	$197	$1,114
C11 Optimize HVAC Schedules and Set Points	$1,979	0.0	0.0	6,618	0	0	$387	0	$0	0	$0	$387	$0	$387
W1 Plumbing Fixture Upgrades	$2,145	0.0	0.0	1,026	0	0	$60	0	$0	22	$189	$249	$10	$259
NW Pompano Beach Totals	$51,786	82.1	0.0	47,457	0	0	$3,720	0	$0	22	$189	$3,909	$976	$4,885
Library Totals	**$5,914,957**	**5,035.8**	**161.8**	**3,080,704**	**483,237**	**113,565**	**$273,443**	**0**	**$0**	**250**	**$2,148**	**$275,591**	**$58,167**	**$333,758**

Summary of Energy Conservation Measures for
Broward County - Libraries

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Controls	$389,471	330.2	-42.6	428,771	252,333	27,011	$43,693	0	0	0	$0	$43,693	$0	$43,693
Mechanical	$997,333	454.1	17.5	130,144	2,260	3,114	$13,394	0	0	0	$0	$13,394	$3,319	$16,713
Lighting	$2,284,465	3,825.8	186.9	1,441,136	220,798	82,662	$147,802	0	0	0	$0	$147,802	$54,667	$202,469
Water	$25,443	0.0	0.0	5,628	389	778	$394	0	0	250	$2,148	$2,542	$181	$2,723
Building Envelope	$12,522	0.0	0.0	2,549	7,457	0	$565	0	0	0	$0	$565	$0	$565
Solar	$2,205,723	425.7	0.0	1,072,476	0	0	$67,595	0	0	0	$0	$67,595	$0	$67,595
Other	$0	0.0	0.0	0	0	0	$0	0	0	0	$0	$0	$0	$0
Total	**$5,914,957**	**5,035.8**	**161.8**	**3,080,704**	**483,237**	**113,565**	**$273,443**	**0**	**0**	**250**	**$2,148**	**$275,591**	**$58,167**	**$333,758**

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Comprehensive List of Energy Conservation Measures
Broward County - Office & Courthouse

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Public Safety Complex														
Public Safety Building														
L1 Interior Lighting Upgrade	$615,053	1,067.0	0.0	215,778	236,727	0	$30,840	0	$0	0	$0	$30,840	$16,250	$47,090
L2 Exterior and Site Lighting Upgrade	$64,413	0.0	0.0	0	134,430	0	$5,752	0	$0	0	$0	$5,752	$1,341	$7,093
C1 Install New BAS	$2,267,567	-549.9	0.0	139,449	1,264,021	0	$55,611	0	$0	0	$0	$55,611	$0	$55,611
M5 Replace R-22 Rooftop Unit (RTU)	$91,061	63.9	0.0	2,306	6,918	0	$1,020	0	$0	0	$0	$1,020	$459	$1,479
M12 Repair Smoke Damper Leakage	$326,550	79.1	0.0	18,462	27,973	0	$2,852	0	$0	0	$0	$2,852	$0	$2,852
M13 Eliminate Uncontrolled Supply Air Diffusers in Mechanica	$24,260	204.4	0.0	209	60,447	0	$4,553	0	$0	0	$0	$4,553	$0	$4,553
W1 Plumbing Fixture Upgrades	$237,846	0.0	0.0	6,409	19,226	0	$1,135	0	$0	1,971	$16,931	$18,066	$1,488	$19,554
W3 Central Control Weather Based Irrigation	$16,099	0.0	0.0	0	0	0	$0	0	$0	151	$1,297	$1,297	$75	$1,372
W4 Cooling Tower Sewer Deduct Meter	$18,794	0.0	0.0	0	0	0	$0	0	$0	2,086	$14,456	$14,456	$0	$14,456
S1 Install Solar PV Rooftop System	$4,313,284	0.0	0.0	673,553	1,276,706	0	$87,405	0	$0	0	$0	$87,405	$0	$87,405
Logistics Warehouse														
L1 Interior Lighting Upgrade	$27,099	20.5	0.0	895	11,183	0	$943	0	$0	0	$0	$943	$338	$1,281
L2 Exterior and Site Lighting Upgrade	$1,753	0.0	0.0	0	1,773	0	$89	0	$0	0	$0	$89	$20	$109
C1 Install New BAS	$6,747	0.0	0.0	0	16,010	0	$808	0	$0	0	$0	$808	$0	$808
Tactical Training Building														
L1 Interior Lighting Upgrade	$38,630	55.3	0.0	30,017	0	0	$2,392	0	$0	0	$0	$2,392	$686	$3,078
L2 Exterior and Site Lighting Upgrade	$2,240	0.0	0.0	2,397	0	0	$140	0	$0	0	$0	$140	$30	$170
C1 Install New BAS	$17,325	0.0	0.0	30,364	0	0	$1,775	0	$0	0	$0	$1,775	$0	$1,775
Central Supply Building														
L1 Interior Lighting Upgrade	$38,630	55.3	0.0	30,017	0	0	$2,392	0	$0	0	$0	$2,392	$686	$3,078
L2 Exterior and Site Lighting Upgrade	$2,240	0.0	0.0	2,397	0	0	$140	0	$0	0	$0	$140	$30	$170
C1 Install New BAS	$6,747	0.0	0.0	9,384	0	0	$549	0	$0	0	$0	$549	$0	$549
M4 Replace R-22 Split System (Evap Coil & Condensing Un	$60,551	18.0	0.0	2,253	0	0	$339	0	$0	0	$0	$339	$563	$902
BSO District 5 Office														
L1 Interior Lighting Upgrade	$97,024	114.0	0.0	23,432	32,804	0	$4,845	0	$0	0	$0	$4,845	$2,787	$7,632
L2 Exterior and Site Lighting Upgrade	$4,166	0.0	0.0	0	3,121	0	$145	0	$0	0	$0	$145	$49	$194
C1 Install New BAS	$42,189	0.0	0.0	0	88,986	0	$4,139	0	$0	0	$0	$4,139	$0	$4,139
Public Safety Complex Totals	$8,320,268	1,127.6	0.0	1,187,322	3,180,325	0	$207,864	0	$0	4,208	$32,684	$240,548	$24,801	$265,349
North Regional Courthouse														
L1 Interior Lighting Upgrade	$411,125	943.9	0.0	299,158	0	0	$27,332	0	$0	0	$0	$27,332	$6,543	$33,875
L2 Exterior and Site Lighting Upgrade	$33,149	0.0	0.0	41,144	0	0	$2,207	0	$0	0	$0	$2,207	$463	$2,670
C11 Optimize HVAC Schedules and Set Points	$9,895	61.8	0.0	21,056	0	0	$1,868	0	$0	0	$0	$1,868	$0	$1,868
M1 Install New Chiller	$485,209	187.5	0.0	39,619	0	0	$4,367	0	$0	41	$352	$4,719	$0	$4,719
M8 Install New AHU	$1,470,987	83.9	0.0	32,445	0	0	$2,744	0	$0	0	$0	$2,744	$0	$2,744
W1 Plumbing Fixture Upgrades	$54,668	0.0	0.0	15,345	0	0	$823	0	$0	1,400	$12,026	$12,849	$373	$13,222
W3 Central Control Weather Based Irrigation	$16,099	0.0	0.0	0	0	0	$0	0	$0	151	$1,297	$1,297	$75	$1,372
S1 Install Solar PV Rooftop System	$3,408,151	194.8	0.0	1,797,720	0	0	$98,774	0	$0	0	$0	$98,774	$0	$98,774
North Regional Courthouse Totals	$5,889,283	1,471.9	0.0	2,246,487	0	0	$138,115	0	$0	1,592	$13,675	$151,790	$7,454	$159,244

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Government Center West														
L1 Interior Lighting Upgrade	$575,866	802.4	0.0	160,487	153,023	0	$28,793	0	$0	0	$0	$28,793	$15,207	$44,000
L2 Exterior and Site Lighting Upgrade	$107,191	0.0	0.0	0	215,793	0	$10,013	0	$0	0	$0	$10,013	$3,211	$13,224
C3 System Check-Out of Existing BAS	$121,102	74.3	0.0	5,438	9,205	0	$1,796	0	$0	0	$0	$1,796	$0	$1,796
C11 Optimize HVAC Schedules and Set Points	$8,895	-72.0	0.0	24,480	98,969	0	$5,286	0	$0	0	$0	$5,286	$0	$5,286
W1 Plumbing Fixture Upgrades	$31,585	0.0	0.0	795	2,385	0	$165	0	$0	150	$1,289	$1,454	$13	$1,467
B1 Seal Building Envelope	$12,066	0.0	0.0	3,589	10,498	0	$731	0	$0	0	$0	$731	$0	$731
S1 Install Solar PV Rooftop System	$878,807	319.2	0.0	154,949	292,419	0	$28,384	0	$0	0	$0	$28,384	$0	$28,384
Government Center West Totals	$1,735,512	1,123.9	0.0	349,738	782,292	0	$75,168	0	$0	150	$1,289	$76,457	$18,431	$94,888
TRAF ENGN Administration North														
L1 Interior Lighting Upgrade	$152,084	97.7	195.3	6,419	45,790	91,579	$3,805	0	$0	0	$0	$3,805	$8,476	$12,281
L2 Exterior and Site Lighting Upgrade	$5,941	0.0	0.0	0	266	533	$12	0	$0	0	$0	$12	$33	$45
W1 Plumbing Fixture Upgrades	$8,053	0.0	0.0	0	0	0	$0	0	$0	275	$2,362	$2,362	$166	$2,528
S1 Install Solar PV Rooftop System	$1,138,513	266.0	0.0	186,451	361,131	0	$35,821	0	$0	0	$0	$35,821	$0	$35,821
TRAF ENGN Administration North Totals	$1,304,591	363.7	195.3	192,870	407,187	92,112	$39,638	0	$0	275	$2,362	$42,000	$8,675	$50,675
PARK Administration Complex														
L1 Interior Lighting Upgrade	$68,659	110.6	0.0	29,519	0	0	$3,000	0	$0	0	$0	$3,000	$827	$3,827
L2 Exterior and Site Lighting Upgrade	$4,510	0.0	0.0	3,545	0	0	$207	0	$0	0	$0	$207	$115	$322
W1 Plumbing Fixture Upgrades	$10,683	0.0	0.0	4,156	0	0	$243	0	$0	254	$2,182	$2,425	$142	$2,567
PARK Administration Complex Totals	$83,852	110.6	0.0	37,220	0	0	$3,450	0	$0	254	$2,182	$5,632	$1,084	$6,716
INTEG WAST South Landfill														
L1 Interior Lighting Upgrade	$59,079	53.2	106.4	3,808	16,498	32,995	$5,139	0	$0	0	$0	$5,139	$783	$5,922
L2 Exterior and Site Lighting Upgrade	$23,051	0.0	0.0	0	8,916	17,833	$1,492	0	$0	0	$0	$1,492	$615	$2,107
B1 Seal Building Envelope	$15,247	0.0	0.0	569	6,206	12,411	$1,117	0	$0	0	$0	$1,117	$0	$1,117
INTEG WAST South Landfill Totals	$97,377	53.2	106.4	4,377	31,620	63,239	$7,748	0	$0	0	$0	$7,748	$1,398	$9,146
Office & Courthouse Totals	**$17,430,883**	**4,250.9**	**301.7**	**4,018,014**	**4,401,424**	**155,351**	**$471,983**	**0**	**$0**	**6,479**	**$52,192**	**$524,175**	**$61,843**	**$586,018**

Summary of Energy Conservation Measures for
Broward County - Office & Courthouse

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Controls	$2,480,467	-485.8	0.0	230,171	1,477,191	0	$71,832	0	0	0	$0	$71,832	$0	$71,832
Mechanical	$2,458,618	636.8	0.0	95,294	95,338	0	$15,875	0	0	41	$352	$16,227	$1,022	$17,249
Lighting	$2,331,903	3,319.9	301.7	849,013	860,324	142,940	$129,678	0	0	0	$0	$129,678	$58,489	$188,167
Water	$393,827	0.0	0.0	26,705	21,611	0	$2,366	0	0	6,438	$51,840	$54,206	$2,332	$56,538
Building Envelope	$27,313	0.0	0.0	4,158	16,704	12,411	$1,848	0	0	0	$0	$1,848	$0	$1,848
Solar	$9,738,755	780.0	0.0	2,812,673	1,930,256	0	$250,384	0	0	0	$0	$250,384	$0	$250,384
Other	$0	0.0	0.0	0	0	0	$0	0	0	0	$0	$0	$0	$0
Total	**$17,430,883**	**4,250.9**	**301.7**	**4,018,014**	**4,401,424**	**155,351**	**$471,983**	**0**	**0**	**6,479**	**$52,192**	**$524,175**	**$61,843**	**$586,018**

Comprehensive List of Energy Conservation Measures
Broward County - Health & Labs

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Central Homeless Assistance Center														
L1 Interior Lighting Upgrade	$118,378	139.1	0.0	34,727	0	0	$3,632	0	$0	0	$0	$3,632	$607	$4,239
L2 Exterior and Site Lighting Upgrade	$43,256	0.0	0.0	16,697	0	0	$976	0	$0	0	$0	$976	$224	$1,200
Central Homeless Assistance Center Totals	$161,634	139.1	0.0	51,424	0	0	$4,608	0	$0	0	$0	$4,608	$831	$5,439
Booher Building														
L1 Interior Lighting Upgrade	$157,969	244.0	0.0	49,219	95,283	0	$11,456	0	$0	0	$0	$11,456	$5,404	$16,860
L2 Exterior and Site Lighting Upgrade	$17,125	0.0	0.0	0	14,655	0	$682	0	$0	0	$0	$682	$403	$1,085
M5 Replace R-22 Rooftop Unit (RTU)	$464,837	45.0	0.0	979	46,330	0	$2,758	0	$0	0	$0	$2,758	$3,938	$6,696
W1 Plumbing Fixture Upgrades	$64,617	0.0	0.0	1,383	4,149	0	$311	0	$0	426	$3,659	$3,970	$407	$4,377
Booher Building Totals	$704,548	289.0	0.0	51,581	160,417	0	$15,207	0	$0	426	$3,659	$18,866	$10,152	$29,018
North Homeless Assistance Center														
L1 Interior Lighting Upgrade	$123,114	165.3	0.0	80,402	0	0	$6,604	0	$0	0	$0	$6,604	$546	$7,150
L2 Exterior and Site Lighting Upgrade	$37,206	0.0	0.0	24,900	0	0	$1,456	0	$0	0	$0	$1,456	$1,662	$3,118
North Homeless Assistance Center Totals	$160,320	165.3	0.0	105,302	0	0	$8,060	0	$0	0	$0	$8,060	$2,208	$10,268
Family Success Center, N. Pompano														
L1 Interior Lighting Upgrade	$49,184	83.2	0.0	27,170	0	0	$2,547	0	$0	0	$0	$2,547	$511	$3,058
L2 Exterior and Site Lighting Upgrade	$13,840	0.0	0.0	15,646	0	0	$915	0	$0	0	$0	$915	$457	$1,372
M5 Replace R-22 Rooftop Unit (RTU)	$83,919	82.5	0.0	9,524	0	0	$1,507	0	$0	0	$0	$1,507	$497	$2,004
S1 Install Solar PV Rooftop System	$212,896	30.4	0.0	102,335	0	0	$6,332	0	$0	0	$0	$6,332	$0	$6,332
Family Success Center, N. Pompano Totals	$359,839	196.1	0.0	154,675	0	0	$11,301	0	$0	0	$0	$11,301	$1,465	$12,766
Sexual Assault Treatment Center														
L1 Interior Lighting Upgrade	$38,339	85.5	0.0	25,864	0	0	$2,497	0	$0	0	$0	$2,497	$589	$3,086
L2 Exterior and Site Lighting Upgrade	$4,470	0.0	0.0	6,432	0	0	$376	0	$0	0	$0	$376	$92	$468
M4 Replace R-22 Split System (Evap Coil & Condensing Uni	$15,999	9.0	0.0	1,976	0	0	$219	0	$0	0	$0	$219	$94	$313
Sexual Assault Treatment Center Totals	$58,808	94.5	0.0	34,272	0	0	$3,092	0	$0	0	$0	$3,092	$775	$3,867
EPD Environmental Monitoring Facility & Lab														
L1 Interior Lighting Upgrade	$51,496	31.5	63.1	2,227	8,908	17,815	$2,896	0	$0	0	$0	$2,896	$1,254	$4,150
L2 Exterior and Site Lighting Upgrade	$6,440	0.0	0.0	0	1,999	3,998	$335	0	$0	0	$0	$335	$242	$577
W1 Plumbing Fixture Upgrades	$3,134	0.0	0.0	0	13	25	$2	0	$0	55	$472	$474	$26	$500
W3 Central Control Weather Based Irrigation	$11,952	0.0	0.0	0	0	0	$0	0	$0	101	$868	$868	$75	$943
EPD Environmental Monitoring Facility & Lab Totals	$73,022	31.5	63.1	2,227	10,920	21,838	$3,233	0	$0	156	$1,340	$4,573	$1,597	$6,170
EAP Our House														
L1 Interior Lighting Upgrade	$3,700	0.0	0.0	766	0	0	$78	0	$0	0	$0	$78	$30	$108
L2 Exterior and Site Lighting Upgrade	$278	0.0	0.0	0	0	0	$0	0	$0	0	$0	$0	$0	$0
M4 Replace R-22 Split System (Evap Coil & Condensing Uni	$11,033	0.0	0.0	126	0	0	$13	0	$0	0	$0	$13	$47	$60
B1 Seal Building Envelope	$877	0.0	0.0	668	0	0	$68	0	$0	0	$0	$68	$0	$68
EAP Our House	$15,888	0.0	0.0	1,560	0	0	$159	0	$0	0	$0	$159	$77	$236
Health & Labs Totals	**$1,534,059**	**915.5**	**63.1**	**401,041**	**171,337**	**21,838**	**$45,660**	**0**	**$0**	**582**	**$4,999**	**$50,659**	**$17,105**	**$67,764**

Summary of Energy Conservation Measures for
Broward County - Health & Labs

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Controls	$0	0.0	0.0	0	0	0	$0	0	0	0	$0	$0	$0	$0
Mechanical	$575,788	136.5	0.0	12,605	46,330	0	$4,497	0	0	0	$0	$4,497	$4,576	$9,073
Lighting	$664,795	748.6	63.1	284,050	120,845	21,813	$34,450	0	0	0	$0	$34,450	$12,021	$46,471
Water	$79,703	0.0	0.0	1,383	4,162	25	$313	0	0	582	$4,999	$5,312	$508	$5,820
Building Envelope	$877	0.0	0.0	668	0	0	$68	0	0	0	$0	$68	$0	$68
Solar	$212,896	30.4	0.0	102,335	0	0	$6,332	0	0	0	$0	$6,332	$0	$6,332
Other	$0	0.0	0.0	0	0	0	$0	0	0	0	$0	$0	$0	$0
Total	**$1,534,059**	**915.5**	**63.1**	**401,041**	**171,337**	**21,838**	**$45,660**	**0**	**0**	**582**	**$4,999**	**$50,659**	**$17,105**	**$67,764**

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Comprehensive List of Energy Conservation Measures
Broward County - Parking, Warehouse and Repair

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
MASS TRAN North Maintenance														
L1 Interior Lighting Upgrade	$615,949	2,106.7	0.0	570,743	493,166	0	$96,064	0	$0	0	$0	$96,064	$8,940	$105,004
L2 Exterior and Site Lighting Upgrade	$112,429	0.0	0.0	0	116,246	0	$5,408	0	$0	0	$0	$5,408	$1,291	$6,699
M4 Replace R-22 Split System (Evap Coil & Condensing Unit	$41,865	17.1	0.0	1,313	2,169	0	$410	0	$0	0	$0	$410	$244	$654
S1 Install Solar PV Rooftop System	$2,055,669	218.5	0.0	359,643	683,832	0	$65,108	0	$0	0	$0	$65,108	$0	$65,108
MASS TRAN North Maintenance Totals	$2,825,912	2,342.3	0.0	931,699	1,295,413	0	$166,990	0	$0	0	$0	$166,990	$10,475	$177,465
BSO Maintenance Facility														
L1 Interior Lighting Upgrade	$47,531	46.4	92.7	2,894	10,611	21,222	$3,790	0	$0	0	$0	$3,790	$607	$4,397
L2 Exterior and Site Lighting Upgrade	$23,447	0.0	0.0	0	5,566	11,131	$931	0	$0	0	$0	$931	$224	$1,155
B1 Seal Building Envelope	$3,636	0.0	0.0	155	1,685	3,371	$303	0	$0	0	$0	$303	$0	$303
BSO Maintenance Facility Totals	$74,614	46.4	92.7	3,049	17,862	35,724	$5,024	0	$0	0	$0	$5,024	$831	$5,855
BCJC South Parking Garage														
L1 Interior Lighting Upgrade	$45,397	68.4	0.0	12,696	0	0	$1,530	0	$0	0	$0	$1,530	$340	$1,870
L2 Exterior and Site Lighting Upgrade	$179,402	0.0	0.0	245,424	0	0	$14,346	0	$0	0	$0	$14,346	$4,315	$18,661
B1 Seal Building Envelope	$3,527	0.0	0.0	6,660	0	0	$389	0	$0	0	$0	$389	$0	$389
S1 Install Solar PV Rooftop System	$777,958	20.9	0.0	329,999	0	0	$19,531	0	$0	0	$0	$19,531	$0	$19,531
BCJC South Parking Garage Totals	$1,006,284	89.3	0.0	594,779	0	0	$35,796	0	$0	0	$0	$35,796	$4,655	$40,451
HIGH & BRDG Mosquito Control														
L1 Interior Lighting Upgrade	$29,783	51.3	0.0	10,447	0	0	$1,202	0	$0	0	$0	$1,202	$224	$1,426
L2 Exterior and Site Lighting Upgrade	$12,016	0.0	0.0	14,805	0	0	$865	0	$0	0	$0	$865	$251	$1,116
M4 Replace R-22 Split System (Evap Coil & Condensing Unit	$20,265	0.6	0.0	755	0	0	$51	0	$0	0	$0	$51	$122	$173
W1 Plumbing Fixture Upgrades	$2,674	0.0	0.0	2,170	0	0	$127	0	$0	90	$773	$900	$44	$944
HIGH & BRDG Mosquito Control Totals	$64,738	51.9	0.0	28,177	0	0	$2,245	0	$0	90	$773	$3,018	$641	$3,659
South Maintenance Shop														
L1 Interior Lighting Upgrade	$18,603	0.0	0.0	9,370	0	0	$950	0	$0	0	$0	$950	$166	$1,116
L2 Exterior and Site Lighting Upgrade	$4,103	0.0	0.0	5,222	0	0	$530	0	$0	0	$0	$530	$79	$609
M4 Replace R-22 Split System (Evap Coil & Condensing Unit	$26,617	0.0	0.0	2,471	0	0	$251	0	$0	0	$0	$251	$150	$401
B1 Seal Building Envelope	$1,750	0.0	0.0	1,397	0	0	$142	0	$0	0	$0	$142	$0	$142
South Maintenance Shop Totals	$51,073	0.0	0.0	18,460	0	0	$1,873	0	$0	0	$0	$1,873	$395	$2,268
MASS Tran Northeast Terminal														
L1 Interior Lighting Upgrade	$14,338	22.8	0.0	6,780	0	0	$659	0	$0	0	$0	$659	$307	$966
L2 Exterior and Site Lighting Upgrade	$23,039	0.0	0.0	54,401	0	0	$3,180	0	$0	0	$0	$3,180	$922	$4,102
MASS Tran Northeast Terminal Totals	$37,377	22.8	0.0	61,181	0	0	$3,839	0	$0	0	$0	$3,839	$1,229	$5,068
Parking, Warehouse and RepairTotals	**$4,059,998**	**2,552.7**	**92.7**	**1,637,345**	**1,313,275**	**35,724**	**$215,767**	**0**	**$0**	**90**	**$773**	**$216,540**	**$18,226**	**$234,766**

Summary of Energy Conservation Measures for
Broward County - Parking, Warehouse and Repair

Energy Conservation Measures	Project Cost ($)	Cumm. On-Peak Demand Savings (kW)	Cumm Off-Peak Demand Savings (kW)	Summer On-Peak Savings (kWh)	Summer Off-Peak Savings (kWh)	Winter Off-Peak Savings (kWh)	Electric Dollar Savings ($)	Gas Energy Savings (Therms)	Gas Dollar Savings ($)	Water/ Sewer Savings (kgal)	Water/ Sewer Savings ($)	Total Utility Savings ($)	Oper. & Maint. Savings ($)	Total Savings ($)
Controls	$0	0.0	0.0	0	0	0	$0	0	0	0	$0	$0	$0	$0
Mechanical	$88,747	17.7	0.0	4,539	2,169	0	$712	0	0	0	$0	$712	$516	$1,228
Lighting	$1,126,037	2,295.6	92.7	932,782	625,589	32,353	$129,455	0	0	0	$0	$129,455	$17,666	$147,121
Water	$2,674	0.0	0.0	2,170	0	0	$127	0	0	90	$773	$900	$44	$944
Building Envelope	$8,913	0.0	0.0	8,212	1,685	3,371	$834	0	0	0	$0	$834	$0	$834
Solar	$2,833,627	239.4	0.0	689,642	683,832	0	$84,639	0	0	0	$0	$84,639	$0	$84,639
Other	$0	0.0	0.0	0	0	0	$0	0	0	0	$0	$0	$0	$0
Total	**$4,059,998**	**2,552.7**	**92.7**	**1,637,345**	**1,313,275**	**35,724**	**$215,767**	**0**	**0**	**90**	**$773**	**$216,540**	**$18,226**	**$234,766**

CONTROL SYSTEM UPGRADES

OpTerra performed an audit of all existing building/HVAC equipment and controls for the Group B buildings. Building Automation Systems (BAS) improve comfort levels, reduce energy use, and improve and extend the operational efficiency of existing building and HVAC equipment. Changes in building utilization sometimes make it difficult to control the physical environment of the facilities and continue to use energy efficiently. A state-of the-art, computer-based BAS and improvements in select buildings will allow Broward County to meet this challenge. OpTerra works closely with controls contractors and the County's' IT departments to both design and implement an energy management and BAS that will provide for the efficient operation of all HVAC equipment.

The existing building controls equipment was inspected and noted as to age, reliability and efficiency. After the equipment was evaluated, the OpTerra team then proceeded with developing practical solutions to improve any underlining problems and areas that stand out for potential energy savers.

During the audit, it was noted that some of the facilities had controls that are outdated and not being fully utilized to realize their full potential in order to maximize energy savings. Some HVAC systems are not controlled by the BAS and were found to be controlled by programmable thermostats or non-programmable thermostats that maintain occupied temperatures 24 hours per day.

A thorough inspection of the HVAC controls revealed that much of the existing systems need a comprehensive expansion and improvement. Upgrades and improvement to the HVAC controls will result in the following benefits for Broward County.

Benefits of these ECMs include:

- Reduction in electric and natural gas consumption
- Improved space temperatures and air quality
- Deferred Maintenance benefits
- Operational Savings
- Increased reliability

ECM C-1: Install New Building Automation System (BAS)

ECM Description:

It was observed during the site assessments that several of the County's facilities do not have any existing Building Automation Systems (BAS) or the existing BAS is obsolete. In these cases, OpTerra is proposing the installation of a new BAS. Buildings operating these obsolete systems will continue to decline in energy performance and occupant comfort and maintenance costs will continue to increase in both the time it takes to repair issues and the costs for replacement parts. The BAS can also be programmed to ensure the appropriate control strategies are implemented that will result in optimal operation of the HVAC systems.

The sites that are considered for a New Building Automation System are as follows:

- **Stirling Road Library:** Currently operating an obsolete KMC Control System. Limited remote access is available through a dial-up modem. Many zones were found to be operating poorly.
- **Public Safety Complex:** The Public Safety Building is currently utilizing a vintage Johnson Controls BAS with DSC-8500 controllers. This system has exceeded its useful life. There are few technicians in the local market that have the ability to service this system. The Tactical Training Building, Logistics Warehouse, and Central Supply Building all utilize standard wall mounted thermostats for control. The BSO District 5 Office utilizes a slightly newer Johnson Controls BAS to control the Rooftop Units.

BAS features, existing conditions, and IT department assistance during the expansion of the existing BAS are described as follows:

BAS Features:

- All hardware and software will communicate with the existing Siemen's Insight Server
- All new BAS systems will be in accordance with the Broward County specifications provided to OpTerra during the Investment Grade Audit.
- Front end software provides a graphical user interface (GUI) in accordance with Broward County standards for Insight Graphics.
- OpTerra will commission the newly installed BAS with coordination between the controls contractor and the facility's personnel. Commissioning provides OpTerra and the County written verification that the BAS operates as intended.

- HVAC equipment controlled by the BAS will be remotely enabled/disabled. The heating and cooling systems will maintain space temperature set points and allow for temperature set point setback during the "unoccupied" periods.

Existing Conditions and IT Department Assistance:

- It is assumed that the existing heaters, dampers, valves, etc. are functional. If the dampers or valves are non-functional, any repairs required to make these devices functional will be the responsibility of the County. During BAS Commissioning, a master issues log will document any mechanical deficiencies that will need to be repaired by County maintenance.
- Pneumatic demo in mechanical rooms is included; however, demo of pneumatic lines above ceilings or in enclosed spaces is not included. Pneumatic lines will be remove and capped at VAV Boxes.
- Monitoring and/or control of CACUs is excluded. These systems are to be operated by County IT Staff.
- Pricing of this proposal is based on the County Information Technology (IT) department providing communication over their existing Ethernet system and installing Ethernet connections (LAN drops) where necessary for communication.
- Unless stated otherwise, it is assumed that all AHU fire/smoke detectors and associated alarms are currently functional. Any repairs required to make these devices functional will be the responsibility of the County.

The HVAC equipment will be scheduled according to the occupancy schedule of the spaces outlined in the OpTerra Standards of Control. It is imperative that the County verify that the BAS schedules match the contract schedules from the Standards of Control. Failing to maintain these schedules will jeopardize the savings guarantee and result in the loss of energy savings. The BAS time of day schedules will be adjustable from the front-end computer.

Energy Savings:

The following is a list of common BAS system capabilities and energy saving features:

1. Outside Air Lockout
Disabling heating equipment when the outside air temperature is greater than a user-defined set point (typically 55°F) saves energy by reducing overheating in the buildings, and also minimizes moisture which could ultimately lead to mold growth. Disabling the cooling system until the outside air temperature exceeds a separate user-defined set point (typically 60°F) also saves equipment runtime and energy. These adjustable systems having the ability to enable/disable set points, prevent simultaneous cooling and heating system operation.

2. Unoccupied Temperature Setback/Setup
The HVAC equipment operates to maintain a space temperature set point during the occupied schedule. When the facility is unoccupied and the HVAC systems are in the cooling mode, the space temperature set point is setup (moved higher) to reduce the cooling load. When the facility is unoccupied and the HVAC system is in the heating mode, the space temperature set point is setback (moved lower) to reduce the heating load on the HVAC system. When the building is unoccupied, outside air dampers are closed, exhaust fans are turned off, and AHU supply fans are turned off unless there are HVAC requirements for 24/7 operation, or the space temperature conditions are exceeded. If necessary to reduce odors, etc., the BAS will purge the

building air before the occupied schedule by briefly running AHUs with outside air dampers set to 100% open.

3. Air Handling Unit Control Features

Fan status will be available on all AHUs. Supervisory controls enable/disable packaged units and split systems while leaving specific equipment control functions to the unit controls that typically come installed directly from the factory. Direct Digital Control (DDC) capabilities include outside/return air damper positioning, hot/chilled water valve actuation, DX cooling system control, and supply air temperature control.

4. Equipment Optimal Start Time

The Optimal Start control strategy determines the most energy efficient time to start the HVAC equipment to bring the building to the occupied set point temperature prior to the occupied period. The BAS software monitors space temperature sensors to "learn" when to start the equipment based on the outside air temperature. If deemed appropriate, Optimal Start can be replaced with operator determined time of day start/stop schedules at the BAS. While bringing the building to the occupied temperature, the outside air dampers will be closed until the occupied schedule start time.

5. Staging of Cooling and Heating Equipment

Areas that are served by multiple pieces of HVAC equipment offer the opportunity to stage (sequence) the proper amount of heating or cooling capacity to match the building load. Without staging, all systems are enabled and tend to short cycle during part load conditions. Short cycling of cooling systems compromises the dehumidification capability of the system and may shorten the life of the equipment, cause mold and mildew issues in the space, etc.

6. Demand Controlled Ventilation

Many existing air handling units provide a fixed quantity of outside air (OA) that determines the amount of fresh air required to maintain proper indoor air quality (IAQ) during design conditions. It is also permissible to set the OA flow by a performance method that allows the OA flow rate to be adjusted as needed to meet the actual occupancy as represented by a tracer gas, such as CO2.

During periods when a space is unoccupied, the OA dampers can be closed. If the OA dampers are left open during this time, it can contribute to unnecessary heating or cooling in the space. Closing the OA dampers during these unoccupied periods in the space will result in energy savings for the County.

7. Static Pressure Reset

Variable air volume (VAV) systems typically have a supply fan motor with a variable frequency drive (VFD) which varies the fan speed to maintain a supply air duct static pressure set point. Instead of maintaining a fixed duct static pressure set point, a control algorithm at the BAS will monitor the damper positions of each VAV box connected to a given AHU, and will reset the duct static pressure set point accordingly. By resetting the static pressure set point, the VFD will adjust the fan speed as needed to minimize the number of VAV dampers in the minimum position. Duct static pressure will be allowed to vary instead of being fixed (as in the present operation) and fan energy can be reduced by up to 20%.

The functions listed above are typical for basic BAS control of HVAC systems. Application of these functions will depend on the types of equipment to be controlled in each building.

O&M Impact/Benefits:

There are many benefits with the expansion of a BAS such as:

- Facility operators can manage and control the applicable HVAC equipment from a central location, or from a remote location, in a web-based application.
- Facility operators can establish standardized energy policies and have the resources to enforce them.
- Facility operators and staff can remotely diagnose problems, even sometimes resolve issues via VPN access in lieu of an in person resolve, thereby reducing maintenance and operations costs.
- With most systems, changes to control parameters at the BAS can be reviewed to make sure maintenance personnel are making energy-wise decisions.

The BAS expansion includes training the maintenance staff on the use of the BAS, which will include at least one day of on-site scheduled training for maintenance personnel. During the commissioning process, maintenance personnel are invited to participate and gain hands-on system training as well.

New BAS Points List:

See the following pages for points list proposed for new BAS System.

Standards of Control

The BAS HVAC schedules shall be programmed in accordance with the HVAC Standards of Control as detailed at the back of this Control write-up.

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

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Stirling Road Library – Points List

LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																		
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE	# of Mapped Pts	
Stirling Raod Library Project Phase - IGA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Set Point	Schedule	Trend	Alarm	Graphic			
ECM-1 New BAS																										
Building																										
Outside Air Temperature	OAT												1								1/2 hr		F, U			
Building Diff Pressure	BLDG-DP														1						1/2 hr		F			
Building Water Meter	BLDG-KGAL									1											1/2 hr		F			Controls Contractor to connect to dry contact pulse from water meter.
Building Electric Meter	BLDG-KW																				1/2 hr		F		5	Controls Contractor to provide and install Veris Meter and map points.
																										(kW, kWh, A, PF, KVAR)
VAV AHU-1																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			With Static Pressure Reset
Duct Static Pressure	SSP														1						1/2 hr		U			
Mixed Air Dampers	MAD-C						1														1/2 hr		U			With DCV
Mixed Air Temp	MAT												1								1/2 hr		U			
DX Stage 1	DX Stg 1 Cmd	1																			COS		U			With OA Lockout
DX Stage 2	DX Stg 2 Cmd	1																			COS		U			
Supply Air Temp	SAT												1								1/2 hr		U			
Supply Air Diff Press	SA-DP														1						1/2 hr		U			
Supply Air Flow	SA-CFM																1				1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Return Air CO2	RA-CO2															1					1/2 hr		U			
Return Air Humidity	RAH													1							1/2 hr		U			
Filter Status	F-DP							1													COS		U			
Fan Motor kW	SF-KW						1														1/2 hr		U			Controls Contractor to provide and install meter
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										With Unoccupied Setback
Zone Damper	SAD-CMD						20														1/2 hr		U			
Supply Air Temp	SAT												20								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	20																			COS		U			
Zone Air Temp	ZAT												20								1/2 hr		F, U			With temp adjust and override
Supply Air Flow Set Point	CFM-SP																				1/2 hr		U			Calculated
Supply Air Flow Actual	CFM																20				1/2 hr		U			
VAV Box w/o Heat																										With Unoccupied Setback
Zone Damper	SAD-CMD						7														1/2 hr		U			
Supply Air Temp	SAT												7								1/2 hr		U			
Zone Air Temp	ZAT												7								1/2 hr		F, U			With temp adjust and override
Supply Air Flow Set Point	CFM-SP																				1/2 hr		U			Calculated
Supply Air Flow Actual	CFM																7				1/2 hr		U			
Exhaust Fans																										
Exhaust Fan Stop/Start	EF-1 Cmd	1																			COS		U			
Exhaust Fan Status	EF-1 Sts											1									COS		U			
Exhaust Fan Stop/Start	EF-2 Cmd	1																			COS		U			
Exhaust Fan Status	EF-2 Sts											1									COS		U			
Lighting Panel																										
Exterior Lights		1																			COS		U			
Corridor Lights		1																			COS		U			
Totals		27	0	0	0	0	30	1	0	2	0	3	58	1	3	1	28	0							5	

Broward County

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Consultant Services, Energy Audit and Performance Consultant Services:
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Public Safety Building – Points List

LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped Pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Set Point	Schedule	Trend	Alarm	Graphic			
ECM-1 New BAS																										
Outside Air Temperature	OSA Temp												1								1/2 hr		F, U			
VAV AHU-1																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Zone Space Temp	ZN-1 Space Temp												8								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														8						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						15																U			
Zone Space Temp	ZN-1 Space Temp												15								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														15						1/2 hr		U			
VAV AHU-2																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						9																U			
Supply Air Temp	SAT												9								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	9																								
Electric Heat Stage-2	Elec Htg Stg-2	3																								
Zone Space Temp	ZN-1 Space Temp												9								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														9						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						15																U			
Zone Space Temp	ZN-1 Space Temp												15								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														15						1/2 hr		U			
Totals		22	0	0	0	0	53	2	0	4	0	2	71	0	49	0	0	0							0	

Broward County

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LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
VAV AHU-3																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						5																U			
Supply Air Temp	SAT												5								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	5																								
Zone Space Temp	ZN-1 Space Temp												5								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														5						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						8																U			
Zone Space Temp	ZN-1 Space Temp												8								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														8						1/2 hr		U			
VAV AHU-4																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Electric Heat Stage-2	Elec Htg Stg-2	1																								
Zone Space Temp	ZN-1 Space Temp												8								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														8						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						9																U			
Zone Space Temp	ZN-1 Space Temp												9								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														9						1/2 hr		U			
Totals		16	0	0	0	0	36	2	0	4	0	2	49	0	32	0	0	0							0	

Broward County

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Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

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LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state		Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic			B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
VAV AHU-5																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						2																U			
Supply Air Temp	SAT												2								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	2																								
Zone Space Temp	ZN-1 Space Temp												2								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														2						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						7																U			
Zone Space Temp	ZN-1 Space Temp												7								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														7						1/2 hr		U			
VAV AHU-6																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						9																U			
Supply Air Temp	SAT												9								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	9																								
Electric Heat Stage-2	Elec Htg Stg-2	0																								
Zone Space Temp	ZN-1 Space Temp												9								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														9						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						9																U			
Zone Space Temp	ZN-1 Space Temp												9								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														9						1/2 hr		U			
Totals		13	0	0	0	0	33	2	0	4	0	2	44	0	29	0	0	0							0	

Broward County

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LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
VAV AHU-7																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						2																U			
Supply Air Temp	SAT												2								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	2																								
Zone Space Temp	ZN-1 Space Temp												2								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														2						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						8																U			
Zone Space Temp	ZN-1 Space Temp												8								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														8						1/2 hr		U			
VAV AHU-8																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						7																U			
Supply Air Temp	SAT												7								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	7																								
Electric Heat Stage-2	Elec Htg Stg-2	1																								
Zone Space Temp	ZN-1 Space Temp												7								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														7						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						7																U			
Zone Space Temp	ZN-1 Space Temp												7								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														7						1/2 hr		U			
Totals		12	0	0	0	0	30	2	0	4	0	2	39	0	26	0	0	0							0	

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LOCATION Broward County - Wide 8/17/2017 Public Safety Building PDA Description	Point Name	HARDWARE – EMS OUTPUTS – DIGITAL: Relay	Solenoid	Contactor	ANALOG: PE Transducer	EP Transducer	0-10vdc or 4-20 mA	EMS INPUTS – DIGITAL: Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	ANALOG: Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	SOFTWARE (Trend: COS = Change of state; Graphics: F = Floor Graphics, U - Unit Graphic, S - Summary Graphic): Schedule	Schedule	Trend	Alarm	Graphic	Communications – TYPE (B = BACnet, L = LON, M = Modbus, N2 = JCI, FLN = Siemens, N = None)	# of Mapped pts	COMMENTS AND SPECIAL FUNCTIONS
VAV AHU-9																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						3																U			
Supply Air Temp	SAT												3								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	2																								
Electric Heat Stage-2	Elec Htg Stg-1	1																								
Zone Space Temp	ZN-1 Space Temp												3								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														3						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						2																U			
Zone Space Temp	ZN-1 Space Temp												2								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														2						1/2 hr		U			
VAV AHU-10																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						4																U			
Zone Space Temp	ZN-1 Space Temp												4								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														4						1/2 hr		U			
																										With temp adjust and override
Totals		5	0	0	0	0	15	2	0	4	0	2	18	0	11	0	0	0							0	

Broward County

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LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
VAV AHU-11																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Zone Space Temp	ZN-1 Space Temp	1																			1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT												8								1/2 hr		U			
VAV Box Clg Only															8											
Zone Damper	ZN Damper																						U			
Zone Space Temp	ZN-1 Space Temp						9														1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT												9								1/2 hr		U			
															9											
VAV AHU-12																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Electric Heat Stage-2	Elec Htg Stg-2	1																								
Zone Space Temp	ZN-1 Space Temp												8								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														8						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						9																U			
Zone Space Temp	ZN-1 Space Temp												9								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														9						1/2 hr		U			
Totals		20	0	0	0	0	40	2	0	4	0	2	56	0	36	0	0	0							0	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

OPTERRA
An ENGIE company

LOCATION: Broward County - Wide
8/17/2017
Public Safety Building
PDA

Trend: COS = Change of state
Graphics: F = Floor Graphics; U - Unit Graphic; S - Summary Graphic
TYPE: B = BACnet; L = LON; M = Modbus; N2 = JCI; FLN = Siemens; N = None

Description	Point Name	HARDWARE – EMS OUTPUTS – DIGITAL: Relay	Solenoid	Contactor	ANALOG: PE Transducer	EP Transducer	0-10vdc or 4-20 mA	EMS INPUTS – DIGITAL: Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	ANALOG: Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	SOFTWARE: Schedule	Schedule	Trend	Alarm	Graphic	Communications: TYPE	# of Mapped pts	COMMENTS AND SPECIAL FUNCTIONS
VAV AHU-13																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Zone Space Temp	ZN-1 Space Temp	1																			1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT												8								1/2 hr		U			
VAV Box Clg Only															8											
Zone Damper	ZN Damper																						U			
Zone Space Temp	ZN-1 Space Temp						9														1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT												9								1/2 hr		U			
															9											
VAV AHU-14																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Electric Heat Stage-2	Elec Htg Stg-2	1																								
Zone Space Temp	ZN-1 Space Temp												8								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														8						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						9																U			
Zone Space Temp	ZN-1 Space Temp												9								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														9						1/2 hr		U			
Totals		20	0	0	0	0	40	2	0	4	0	2	56	0	36	0	0	0							0	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

OPTERRA
An ENGIE company

LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state		Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic			B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
VAV AHU-15																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Zone Space Temp	ZN-1 Space Temp	1																			1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT												8								1/2 hr		U			
VAV Box Clg Only															8											
Zone Damper	ZN Damper																						U			
Zone Space Temp	ZN-1 Space Temp						9														1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT												9								1/2 hr		U			
															9											
VAV AHU-16																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Electric Heat Stage-2	Elec Htg Stg-2	1																								
Zone Space Temp	ZN-1 Space Temp												8								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														8						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						9																U			
Zone Space Temp	ZN-1 Space Temp												9								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														9						1/2 hr		U			
Totals		20	0	0	0	0	40	2	0	4	0	2	56	0	36	0	0	0							0	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

OPTERRA
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LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
VAV AHU-17																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Zone Space Temp	ZN-1 Space Temp	1																			1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT												8								1/2 hr		U			
VAV Box Clg Only															8											
Zone Damper	ZN Damper																						U			
Zone Space Temp	ZN-1 Space Temp						9														1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT												9								1/2 hr		U			
															9											
VAV AHU-18																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Supply Fan VFD Speed	SFVFD Speed						1																U			
Duct Static Pressure	Duct SP														1						1/2 hr		U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
VAV Box w/Heat																										
Zone Damper	ZN Damper						8																U			
Supply Air Temp	SAT												8								1/2 hr		U			
Electric Heat Stage-1	Elec Htg Stg-1	8																								
Electric Heat Stage-2	Elec Htg Stg-2	1																								
Zone Space Temp	ZN-1 Space Temp												8								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														8						1/2 hr		U			
VAV Box Clg Only																										
Zone Damper	ZN Damper						9																U			
Zone Space Temp	ZN-1 Space Temp												9								1/2 hr		F, U			With temp adjust and override
Pressure Transducer	PT														9						1/2 hr		U			
Totals		20	0	0	0	0	40	2	0	4	0	2	56	0	36	0	0	0							0	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

OPTERRA
An ENGIE company

LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
CV AHU-19																				1						With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
Mixed Air Damper	MA Damper						1																U			Replace pneumatic actuator with electric
Mixed Air Temp	MAT												1								1/2 hr		U			
CHW Coil Valve	CHW Valve						1														COS		U			Replace pneumatic actuator with electric
Supply Air Temp	SAT												1								1/2 hr		U			
Return Air Temp	RAT												1								1/2 hr		U			
Filter Status	Flt Sts							1													COS		U			
SA Smoke Detector Alm	Smk Alarm									1											COS		U			
RA Smoke Detector Alm	Smk Alarm									1											COS		U			
RTU-1																										With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
DX Compressor Stage 1	DX Stg 1 Cmd	1																			COS		U			
DX Compressor Stage 2	DX Stg 2 Cmd	1																			COS		U			
Elec Heat Stg-1	ZN-1 Elec Htg Stg-1	1																			COS		U			
Elec Heat Stg-2	ZN-1 Elec Htg Stg-2	1																			COS		U			
Supply Air Temp	ZN-1 SAT												1								1/2 hr		U			
Space Temp	ZN-1 Space Temp												1								1/2 hr		F, U			With temp adjust and override
RTU-2																										With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
DX Compressor Stage 1	DX Stg 1 Cmd	1																			COS		U			
DX Compressor Stage 2	DX Stg 2 Cmd	1																			COS		U			
Elec Heat Stg-1	ZN-1 Elec Htg Stg-1	1																			COS		U			
Elec Heat Stg-2	ZN-1 Elec Htg Stg-2	1																			COS		U			
Supply Air Temp	ZN-1 SAT												1								1/2 hr		U			
Space Temp	ZN-1 Space Temp												1								1/2 hr		F, U			With temp adjust and override
RTU-3																										With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
DX Compressor Stage 1	DX Stg 1 Cmd	1																			COS		U			
DX Compressor Stage 2	DX Stg 2 Cmd	1																			COS		U			
Elec Heat Stg-1	ZN-1 Elec Htg Stg-1	1																			COS		U			
Elec Heat Stg-2	ZN-1 Elec Htg Stg-2	1																			COS		U			
Supply Air Temp	ZN-1 SAT												1								1/2 hr		U			
Space Temp	ZN-1 Space Temp												1								1/2 hr		F, U			With temp adjust and override
RTU-4																										With Optimal Start
Supply Fan Start/Stop	SF Cmd	1																			COS		U			
Supply Fan Status	SF Sts											1									COS	X	U			
DX Compressor Stage 1	DX Stg 1 Cmd	1																			COS		U			
DX Compressor Stage 2	DX Stg 2 Cmd	1																			COS		U			
Elec Heat Stg-1	ZN-1 Elec Htg Stg-1	1																			COS		U			
Elec Heat Stg-2	ZN-1 Elec Htg Stg-2	1																			COS		U			
Supply Air Temp	ZN-1 SAT												1								1/2 hr		U			
Space Temp	ZN-1 Space Temp												1								1/2 hr		F, U			With temp adjust and override
Totals		21	0	0	0	0	2	1	0	2	0	5	11	0	0	0	0	0							0	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

OPTERRA
An ENGIE company

LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
Chiller 1 thru 3																										Communication with chiller
CHLR1-STOP/START	CHLR CMD	1																			COS		U			
CHLR1-STATUS	CHW ISO VALVE									1											COS		U			
CHLR1-CHWISOVLV	CHW ISO VALVE	1																			COS		U			
CHLR1-CWISOVLV	CW ISO VALVE	1																			COS		U			
CHLR1-A	CHLR ALARM																						U		1	
CHL1.PH.C.AMP	PH.C.AMP																						U		1	
CHL1.PH.B.AMP	PH.B.AMP																						U		1	
CHL1.PH.A.AMP	PH.A.AMP																						U		1	
CHL1.MTR.CUR	MTR.CUR																						U		1	
CHL1.CDST	CWS TEMP																						U		1	
CHL1.CDRT	CWR TEMP																						U		1	
CHL1.OIL.PRS	OIL.PRS																						U		1	
CHL1 .CDPR	CWD TEMP																						U		1	
CHL1.EVPR	CWP TEMP																						U		1	
CHL1.CHRT	CWR TEMP																						U		1	
CHL1.CHST	CWS TEMP																						U		1	
CHL1.PUR.PRS	PUR.PRS																						U		1	
CHL1.OIL.T	OIL.T																						U		1	
CHL1.DISCH.T	DISCH.T																						U		1	
CHL1.CD.SAT.T	CD.SAT.T																						U		1	
CHL1.EVAP.SAT.T	EVAP.SAT.T																						U		1	
CHL1.CUR.SP	CUR.SP																						U		1	
CHL1.CHST.SP	CHST.SP																						U		1	
CHL1.C-A.VOLT	C-A.VOLT																						U		1	
CHL1.B-C.VOLT	B-C.VOLT																						U		1	
CHL1.A-B.VOLT	A-B.VOLT																						U		1	
CHL1.CYC.CODE	CYC.CODE																						U		1	
CHL1.SAFETY.CODE	SAFETY.CODE																						U		1	
CHL1.OP.CODE	OP.CODE																						U		1	
CHL1.OP.MODE	OP.MODE																						U		1	
CHL1.ANTI.RECYCL	ANTI.RECYCL																						U		1	
CHL1-kW	kW																						U		1	
CHL1-FLOW	FLOW-GPM																						U		1	
Totals		3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0							29	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

OPTERRA
An ENGIE company

LOCATION: Broward County - Wide
8/17/2017
Public Safety Building
PDA

Trend: COS = Change of state
Graphics: F = Floor Graphics; U - Unit Graphic; S - Summary Graphic
TYPE: B = BACnet; L = LON; M = Modbus; N2 = JCI; FLN = Siemens; N = None

Description	Point Name	HARDWARE – EMS OUTPUTS – DIGITAL: Relay	Solenoid	Contactor	ANALOG: PE Transducer	EP Transducer	0-10vdc or 4-20 mA	EMS INPUTS – DIGITAL: Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	ANALOG: Temperature	Relative Humidity	PSI, or PSIG, or PSD	IAQ Sensor Carbon Monoxide Level /	Air Flow (CFM)	Other	SOFTWARE: Schedule	Schedule	Trend	Alarm	Graphic	Communications: TYPE	# of Mapped pts	COMMENTS AND SPECIAL FUNCTIONS
CHLR2-STOP/START	CHLR CMD	1																			COS		U			
CHLR2-STATUS	CHW ISO VALVE									1											COS		U			
CHLR2-CHWISOVLV	CHW ISO VALVE	1																			COS		U			
CHLR2-CWISOVLV	CW ISO VALVE	1																			COS		U			
CHLR2-A	CHLR ALARM																						U		1	
CHL2.PH.C.AMP	PH.C.AMP																						U		1	
CHL2.PH.B.AMP	PH.B.AMP																						U		1	
CHL2.PH.A.AMP	PH.A.AMP																						U		1	
CHL2.MTR.CUR	MTR.CUR																						U		1	
CHL2.CDST	CWS TEMP																						U		1	
CHL2.CDRT	CWR TEMP																						U		1	
CHL2.OIL.PRS	OIL.PRS																						U		1	
CHL2 .CDPR	CWD TEMP																						U		1	
CHL2.EVPR	CWP TEMP																						U		1	
CHL2.CHRT	CWR TEMP																						U		1	
CHL2.CHST	CWS TEMP																						U		1	
CHL2.PUR.PRS	PUR.PRS																						U		1	
CHL2.OIL.T	OIL.T																						U		1	
CHL2.DISCH.T	DISCH.T																						U		1	
CHL2.CD.SAT.T	CD.SAT.T																						U		1	
CHL2.EVAP.SAT.T	EVAP.SAT.T																						U		1	
CHL2.CUR.SP	CUR.SP																						U		1	
CHL2.CHST.SP	CHST.SP																						U		1	
CHL2.C-A.VOLT	C-A.VOLT																						U		1	
CHL2.B-C.VOLT	B-C.VOLT																						U		1	
CHL2.A-B.VOLT	A-B.VOLT																						U		1	
CHL2.CYC.CODE	CYC.CODE																						U		1	
CHL2.SAFETY.CODE	SAFETY.CODE																						U		1	
CHL2.OP.CODE	OP.CODE																						U		1	
CHL2.OP.MODE	OP.MODE																						U		1	
CHL2.ANTI.RECYCL	ANTI.RECYCL																						U		1	
CHL2-kW	kW																						U		1	
CHL2-FLOW	FLOW-GPM																						U		1	
Totals		3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0							29	

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LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																		
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE	# of Mapped pts	
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
CHLR3-STOP/START	CHLR CMD	1																			COS		U			With Optimal Start
CHLR3-STATUS	CHW ISO VALVE									1											COS	X	U			
CHLR3-CHWISOVLV	CHW ISO VALVE	1																			COS		U			
CHLR3-CWISOVLV	CW ISO VALVE	1																			COS		U			
CHLR3-A	CHLR ALARM																					X	U		1	
CHL3.PH.C.AMP	PH.C.AMP																						U		1	
CHL3.PH.B.AMP	PH.B.AMP																						U		1	
CHL3.PH.A.AMP	PH.A.AMP																						U		1	
CHL3.MTR.CUR	MTR.CUR																						U		1	
CHL3.CDST	CWS TEMP																						U		1	
CHL3.CDRT	CWR TEMP																						U		1	
CHL3.OIL.PRS	OIL.PRS																						U		1	
CHL3 .CDPR	CWD TEMP																						U		1	
CHL3.EVPR	CWP TEMP																						U		1	
CHL3.CHRT	CWR TEMP																						U		1	
CHL3.CHST	CWS TEMP																						U		1	
CHL3.PUR.PRS	PUR.PRS																						U		1	
CHL3.OIL.T	OIL.T																						U		1	
CHL3.DISCH.T	DISCH.T																						U		1	
CHL3.CD.SAT.T	CD.SAT.T																						U		1	
CHL3.EVAP.SAT.T	EVAP.SAT.T																						U		1	
CHL3.CUR.SP	CUR.SP																						U		1	
CHL3.CHST.SP	CHST.SP																						U		1	
CHL3.C-A.VOLT	C-A.VOLT																						U		1	
CHL3.B-C.VOLT	B-C.VOLT																						U		1	
CHL3A-B.VOLT	A-B.VOLT																						U		1	
CHL3.CYC.CODE	CYC.CODE																						U		1	
CHL3.SAFETY.CODE	SAFETY.CODE																						U		1	
CHL3.OP.CODE	OP.CODE																						U		1	
CHL3.OP.MODE	OP.MODE																						U		1	
CHL3.ANTI.RECYCL	ANTI.RECYCL																						U		1	
CHL3-kW	kW																						U		1	
CHL3-FLOW	FLOW-GPM																						U		1	
Totals		3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0							29	

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LOCATION		HARDWARE																	SOFTWARE					Communications		
Broward County - Wide		EMS OUTPUTS						EMS INPUTS																	# of Mapped Pts	
8/17/2017		DIGITAL			ANALOG			DIGITAL					ANALOG											TYPE		
Public Safety Building PDA		Relay	Solenoid	Contactor	PE Transducer	EP Transducer	0-10vdc or 4-20 mA	Pressure Switch	Flow Switch	Switch Closure	Override	Current Switch	Temperature	Relative Humidity	PSI, or PSIG, or PSD	Carbon Monoxide Level / IAQ Sensor	Air Flow (CFM)	Other	Trend COS = Change of state			Graphics: F = Floor Graphics U - Unit Graphic S - Summary Graphic		B = BACnet L = LON M = Modbus N2 = JCI FLN = Siemens N = None		COMMENTS AND SPECIAL FUNCTIONS
Description	Point Name																		Schedule	Schedule	Trend	Alarm	Graphic			
CHW Pump-1 Start/Stop	CHWP-1-CMD	1																			COS		U			
CHW Pump-1 Status	CHWP-1-STS											1									COS	X	U			
CHW Pump-2 Start/Stop	CHWP-2-CMD	1																			COS		U			
CHW Pump-2 Status	CHWP-2-STS											1									COS	X	U			
CHW Pump-3 Start/Stop	CHWP-3-CMD	1																			COS		U			
CHW Pump-3 Status	CHWP-3-STS											1									COS	X	U			
CHWS Temp	CHWS-TEMP												1								1/2 hr		U			
CHWR Temp	CHWR-TEMP												1								1/2 hr		U			
CW Pump-1 Start/Stop	CWP-1-CMD	1																			COS		U			
CW Pump-1 Status	CWP-1-STS											1									COS	X	U			
CW Pump-2 Start/Stop	CWP-2-CMD	1																			COS		U			
CW Pump-2 Status	CWP-2-STS											1									COS	X	U			
CW Pump-3 Start/Stop	CWP-3-CMD	1																			COS		U			
CW Pump-3 Status	CWP-3-STS											1									COS	X	U			
CWS Temp	CWS-TEMP												1								1/2 hr		U			
CWR Temp	CWR-TEMP												1								1/2 hr		U			
Tower Fan-1 Start/Stop	TWR FAN-1 CMD	1																			COS	X	U			
Tower Fan-1 Speed	TWR FAN-1 SPEED						1																			
Exhaust Fans 1 thru 20																										
Exh Fan-1 Start/Stop	EXHFAN CMD	20																			COS		U, S			
Exh Fan-1 Status	EXHFAN STS											20									COS	X	U, S			
Space Temp	SPACE TEMP												10								1/2 hr	X	U, S			
Smoke Dampers 1 thru 20																										
Damper Open/Close	DAMPER CMD	20																			COS		U, S			
Damper Position	DAMPER STS									20											COS	X	U, S			
Totals		47	0	0	0	0	1	0	0	20	0	26	14	0	0	0	0	0							0	

Total Hardware Points for This Sheet	108	Total Hardware Points for This Building	1445
Total Mapped Points for This Sheet	0	Total Mapped Points for This Building	87

ECM C-2: Energy Efficient Upgrades to Existing Building Automation System (BAS)

ECM Description:

In general, the majority of County facilities have a Building Automation Systems (BAS) installed and most were found to be in good working order. These existing systems are typically designed by various engineers with vastly different budget constraints. During the site assessments, OpTerra determined that select BAS Systems could benefit from the implementation of energy efficient control strategies. These upgrades include modifications to the control logic, sequence of operation, and the installation of specific control sensors and/or devices. These modifications will help improve the overall energy performance of the buildings.

Below are descriptions of the recommended modifications which is followed by site-by-site tables that illustrate which energy efficient control strategies are recommended for each site.

Energy Efficient Control Strategy Descriptions

Optimal Start

The Optimal Start control strategy determines the most energy efficient time to start the HVAC equipment to bring the building to the occupied set point temperature prior to the occupied period. The BAS software monitors space temperature sensors to "learn" when to start the equipment based on the outside air temperature. If deemed appropriate, Optimal Start can be replaced with operator determined start/stop schedules. While bringing the building to the occupied temperature, the outside air dampers will be closed until the occupied schedule start time. Any CHW or HW systems/loops must be changed from scheduled start/stop to demand based enabling/disabling where a call for heating or cooling enables the plant to operate.

Unoccupied Temperature Setback/Setup

The HVAC equipment operates to maintain space temperature set point during the occupied schedule. When the facility is unoccupied and the HVAC systems are in the cooling mode, the space temperature set point is setup (moved higher) to reduce the cooling load. When the facility is unoccupied and the HVAC system is in the heating mode, the space temperature set point is setback (moved lower) to reduce the heating load on the HVAC system. When the building is unoccupied, outside air dampers are closed, exhaust fans are turned off, and AHU supply fans are turned off unless there are HVAC requirements for 24/7 operation. If necessary to reduce odors, etc., the BAS will purge the building air before the occupied schedule by briefly running AHUs with outside air dampers set to 100% open. Any CHW or HW systems/loops must be changed from scheduled start/stop to demand based enabling/disabling where a call for heating or cooling enables the plant to operate.

Outside Air Lockout

Disabling heating equipment when the outside air temperature is greater than a user-defined set point (typically 55°F) saves energy by reducing overheating in the buildings. Disabling the cooling system until the outside air temperature exceeds a separate user-defined set point (typically 60°F) saves equipment runtime and energy. These adjustable system enable/disable set points prevent simultaneous cooling and heating system operation.

Demand Controlled Ventilation

Many existing air handling units provide a fixed quantity of outside air (OA) set by a prescriptive method that determines the amount of fresh air required to maintain Indoor Air Quality (IAQ) during design conditions. It is also permissible to set the OA flow by a performance method that allows the OA flow rate to be adjusted as needed to meet the actual occupancy as represented by a tracer gas, such as CO2.

During the unoccupied period, the OA dampers can be closed or OA fans turned off. If the OA dampers are left open or fans are energized, it can contribute to unnecessary high humidity levels. Disabling OA during the unoccupied period will lower the humidity level in the space and result in a more comfortable space.

If no existing CO2 sensors or motorized dampers/actuators are installed, these sensors and devices will be install for a fully functional sequence.

Static Pressure Reset for VAV Systems

Variable air volume (VAV) systems typically have a supply fan motor with a variable frequency drive (VFD) which varies fan speed to maintain a supply duct static pressure at a fixed set point. Instead of maintaining a fixed duct static pressure, a control algorithm will monitor the damper positions of each VAV box connected to a given AHU, adjust fan speed to maintain space temperature set points, and minimize the number of VAV dampers in the minimum position. Duct static pressure will be allowed to vary instead of being fixed (as in the present operation) and fan energy can be reduced by up to 20%.

If no existing static pressure sensors are installed, these sensors will be installed for a fully functional sequence.

Chilled Water Supply Temperature Reset

If no CHW DP reset is being utilized, the CHWST Reset shall be adjusted based on a linear OA Reset Schedule. If CHW loop DP reset is being utilized, CHWST Reset shall only begin to operate when CHW pump speed is at minimum speed.

Chilled Water Loop DP Reset

For Variable Flow CHW Loops, the CHW Pump speed shall be modulated between maximum flow and minimum flow set points (Determined by the required for to meet all loads simultaneously and minimum flow for pump operation per manufacturer and TAB). In this range, SP shall be reset based on interval polling of CHW valve position to maintain at least one CHW valve at a position of 90% open, or higher. If this position is not meet, then the static pressure set point is reset upwards, thus reducing pump speed and CHW flow, ultimately increasing CHW valve position.

Outside Air Control

When a unit is enabled during an unoccupied period to maintain an unoccupied temperature set point, this control strategy shall disable outside air by either closing the outside air damper or by disabling the outside air fan associated with the unit.

Humidity Control

This strategy adds a high humidity limit to the control logic for a particular unit. This shall force a unit to provide cooling, regardless of space temperature, in an effort to reduce humidity levels in the space. Any unit that is to have humidity control, must have a form of reheat (electric strip, hot gas reheat, etc.) available to keep spaces within the occupied or unoccupied temperature range.

Applicable Energy Efficient Control Strategies (by Site)

Site Name: African American Library
Existing BAS: JCI

Equipment Type	Qty	Optimal Start	Unoccupied Temperature Setback/Setup	Outside Air Lockout	Demand Controlled Ventilation	Static Pressure Reset for VAV Systems	CHW Supply Temperature Reset	CHW Loop Static Pressure Reset	Humidity Control
Chiller(s)	1			X			X		
CHW Pump(s)	2							X	
SZ Air Handling Units (CHW)	5	X	X		X				AHU-5 Only
VAV Air Handling Units (CHW)	4	X			X	X			
Fan Coil Units (CHW)	3	X							
Split DX Systems	2	X	X	X					
VAVs	27		X						
Fans (OA/Exh/etc)	9	X							

*For VAV AHUs, Unoccpied Setbacks are determined at the VAV Zone Level. AHUs enable/disable based up zone needs.

Site Name: Dan Pearl (Sunrise) Library
Existing BAS: JCI w/Siemens Overlay

Equipment Type	Qty	Optimal Start	Unoccupied Temperature Setback/Setup	Outside Air Lockout	Demand Controlled Ventilation	Static Pressure Reset for VAV Systems	CHW Supply Temperature Reset	CHW Loop Static Pressure Reset	Humidity Control
SZ Air Handling Units (DX)	1	X	X	X					
VAV Air Handling Units (DX)	1	X	X	X					
VAVs	7		X						
Fans (OA/Exh/etc)	4	X							

*For VAV AHUs, Unoccpied Setbacks are determined at the VAV Zone Level. AHUs enable/disable based up zone needs.

Existing Conditions:

- It is assumed that all existing control devices are functional. If the control devices are non-functional, any repairs required to make these devices functional will be the responsibility of the County.
- Configuration for sites with Johnson Controls N2 ASC controllers may be limited. PMI and GPL must be available at site for modification.

O&M Impact/Benefits:

There are many benefits with implementing energy efficient control strategies, which include:

- Reduced equipment operating time.
- Elimination of excess ventilation which will reduce moisture infiltration into the buildings.
- Reduction in fan noise inside the building.

ECM C-3: System Check-Out of Existing BAS

ECM Description:

As discussed previously, many of Broward County's facilities utilize an existing Building Automation System to control HVAC equipment. During the site assessments, issues were identified which are a result of the existing BAS not operating to is original design intent. The existing BAS systems were designed by various engineers, installed by different controls contractors, and maintained by a large facilities maintenance department. As a result, set points have been changed, many schedules have been removed, points have been locked, sequences changed, etc. All these changes result in inefficient building operation, an increase in annual utility consumption, and a decrease in occupant comfort.

OpTerra engineers assessed the existing BAS and identified many areas for improvement:

- Graphics: Graphical User Interface (GUI) could be improved for better operator control and improved ability to diagnose issues and/or modify critical points.
- Scheduling: Pieces of HVAC equipment (AHUs, Fans, RTUs, S/S, etc.) have schedules that are not current, incomplete, or missing altogether.
- Sensor Calibration: At some locations, room temperature sensors were found to be off by two or more degrees.
- Sensor Location: Select sensors were located behind large copiers or storage units which leads to unstable temperature control.
- Sequence of operation: Several units were not performing as expected during the time OpTerra was on-site.

Below are examples of some of the deficiencies observed during the site assessments which is followed by site-by-site tables that illustrate the included equipment and Not-To-Exceed labor hour allocations by both OpTerra commissioning engineers and Certified BAS programmers.

Improper Location of Temperature Sensor Meeting Room

Significant Over-Cooling of

Inaccurate Temperature Sensor

VFD in Bypass Mode (Hand)

As part of the System-Check Out, existing primary HVAC equipment controlled through the BAS will be reviewed according to the following retro-commissioning process:

- **Analog Input**
  The analog input points will be tested in two steps, first for the actual point name and location. This will entail removing a wire for the remote point and waiting for the system to show a non-responsive sensor. Then, the point will be tested for the actual temperature, pressure or other type of sensor point. This test will entail using a sensor of the type required and that the specified accuracy of the sensor falls into the acceptable range.

- **Analog Output**
  The analog output points will be tested for the actual point verification and functionality in one test. This will entail driving the end device to three specific points with an observation that the end device has responded to that command. There will be signals sent for 0% output, 50% output and 100% output. The critical point of this test is to assure the accuracy of the 50% command, since this will assure the drive timing and analog output calibration are correct.

- **Digital Input**
  The digital input points will be tested in two steps. First, the point will be changed from its current state to assure that the point is correctly labeled and wired. The second test will confirm the point by cycling the monitored field device and observing the status change through the BAS.

- **Digital Output**
  The digital output points will be tested in one step. The point will be tested for the name, location and functionality by commanding the end device to on or off, and ensuring that the end device functions in the appropriate manner.

- **Summary of Testing**
  OpTerra will identify any existing HVAC equipment that is found during the BAS commissioning not to be functioning properly, and notify the County in writing.

- **Simple Verification of Sequences (Functional Test)**
  The functional test will have two separate stages the first stage will be the observation of specific temperature and pressures. The technician will repair the temperatures or pressures to specific points and watch the reaction of the system. This will verify the basic sequence of operation for cooling and heating conditions, where applicable.
- **Endurance Test**
  The second part will be considered the endurance test. This test will be focused on trending the system points for a period of two weeks and then reviewing these trends for correct sequence of operation. Once these systems are operating appropriately, the reports will be presented to the County personnel.
- **General Functions of the BAS**
  This section will describe the functions and sequences that will be utilized when establishing the recommissioning approach being performed at the building.

Additional Tasks OpTerra Will Perform

- Utilize control engineer(s) and control programmers to update, modify, and check-out the existing BAS.
- Update graphics for existing equipment and floor plans.
- Revise and update schedules including groups, equipment, holidays, events, and priority level designations.
- Verify Sequences of Operation, make necessary changes to ensure optimal system operation.
    - Sequence changes will be made to the original engineered control sequence of operation, or standard industry practice.
- Identify system deficiencies by creating a log of potential hardware, software, and equipment issues. The equipment to be checked includes sensors, dampers, actuators, controllers, valves, etc. The resulting list of system deficiencies gives Broward County FMD improved ability to request HVAC and BAS service and repairs within their current service agreements.

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Applicable System Check-Out Included Labor Hours (by Site)

Site Name: African American Library
Existing BAS: JCI

Equipment Type	Qty	Included Labor Hours (Not-to-Exceed)	
		OpTerra Engineer	Controls Engineer
Chiller(s)	1	3	3
CHW Pump(s)	2	4	4
SZ Air Handling Units (CHW)	5	9	10
VAV Air Handling Units (CHW)	4	7	10
Fan Coil Units (CHW)	3	4	5
Split DX Systems	2	3	3
VAVs	27	36	41
Fans (OA/Exh/etc)	9	9	9
TOTAL		**75**	**85**

Site Name: West Regional Library
Existing BAS: JCI

Equipment Type	Qty	Included Labor Hours (Not-to-Exceed)	
		OpTerra Engineer	Controls Engineer
Chiller(s)	2	5	5
Cooling Tower Fan(s)	2	4	4
CHW Pump(s)	2	4	4
CW Pump(s)	3	6	6
VAV Air Handling Units (CHW)	7	12	17
Fan Coil Units (CHW)	1	2	2
VAVs	66	86	99
Fans (OA/Exh/etc)	18	17	18
TOTAL		**136**	**155**

Site Name: Northwest Regional Library
Existing BAS: JCI

Equipment Type	Qty	Included Labor Hours (Not-to-Exceed)	
		OpTerra Engineer	Controls Engineer
Chiller(s)	2	4.6	4.6
CHW Pump(s)	2	3.4	4
SZ Air Handling Units (CHW)	3	5.1	6
VAV Air Handling Units (CHW)	2	3.4	4.6
Split DX Systems	2	2.6	2.8
VAVs	31	40.3	46.5
Fans (OA/Exh/etc)	10	9	10
TOTAL		**68.4**	**78.5**

Site Name: Weston Library
Existing BAS: JCI

Equipment Type	Qty	Included Labor Hours (Not-to-Exceed)	
		OpTerra Engineer	Controls Engineer
Chiller(s)	1	2.3	2.3
CHW Pump(s)	2	3.4	4
VAV Air Handling Units (CHW)	3	5.1	6.9
Split DX Systems	3	3.9	4.2
VAVs	49	63.7	73.5
Fans (OA/Exh/etc)	6	5.4	6
TOTAL		**83.8**	**96.9**

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Site Name: Margate
Existing BAS: JCI

Equipment Type	Qty	Included Labor Hours (Not-to-Exceed)	
		OpTerra Engineer	Controls Engineer
Chiller(s)	1	2.3	2.3
CHW Pump(s)	1	1.7	2
VAV Air Handling Units (CHW)	2	3.4	4.6
VAVs	21	27.3	31.5
Fans (OA/Exh/etc)	6	5.4	6
		40.1	**46.4**

Site Name: Government Center West
Existing BAS: Carrier CCN

Equipment Type	Qty	Included Labor Hours (Not-to-Exceed)	
		OpTerra Engineer	Controls Engineer
Chiller(s)	2	4.6	4.6
Cooling Tower Fan(s)	2	3.2	3.6
CHW Pump(s)	2	3.4	4
CW Pump(s)	2	3.4	4
VAV Air Handling Units (CHW)	12	20.4	27.6
Rooftop/Packaged DX Units	2	3.4	4
Split DX Systems	3	3.9	4.2
VAVs	143	185.9	214.5
Fans (OA/Exh/etc)	6	5.4	6
TOTAL		**233.6**	**272.5**

O&M Impact/Benefits:

A comprehensive system check-out of the exiting BAS System will greatly improve building energy performance and result in fewer maintenance work orders for the Facilities Maintenance Department.

- Facility operators will have an improved, user-friendly system, featuring front end software with Graphical User Interface (GUI).
- Facility operators will have improved base schedules to schedule mechanical equipment per occupancy for each area, improving comfort and efficiency.
- Facility operators can better establish standardized policies such as temperature setbacks and set points and enforce them remotely, improving comfort and efficiency.
- Facility operators have improved ability to troubleshoot equipment and maintain the individual components of the BAS.
- Facility operators have improved ability to identify potential HVAC or BAS problems that can then be covered by the current service agreement.

ECM C-11: Optimize HVAC Schedules and Set Points

ECM Description:

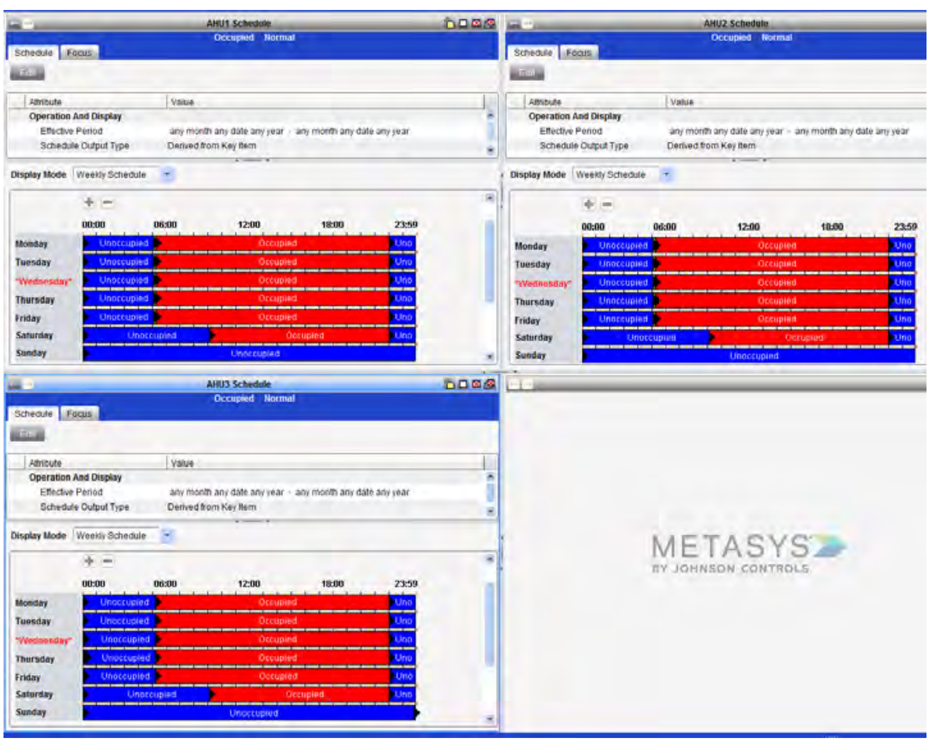
It was observed during the audit and inspection of the HVAC schedules that were provided to OpTerra that many of the existing HVAC systems operate much longer than the building occupied period. Significant energy savings could be realized by implementing unoccupied temperature setbacks for applicable HVAC equipment. During periods when the building is occupied, per the building occupancy schedule, the HVAC systems operate normally to maintain an occupied cooling or heating set point. However, during unoccupied times (typically overnight and weekends) those temperature set points are permitted to drift 8-10 degrees either higher or lower depending on season.

In situations where Optimal Start is not utilized, it is typically sufficient to start the HVAC systems two hours prior to the building normal start of business and set back to unoccupied temperatures immediately following the building normal close of business. In applications with Optimal Start, the software determines the HVAC start time based upon recent trends and the scheduled building occupancy start time.

In conjunction with County Staff, OpTerra has created the Schedule of Control tables below. These table illustrate the current building occupancy schedules, existing HVAC schedules, and the proposed HVAC schedules as a result of this ECM. It is imperative that the County review, understand, and adhere to these proposed schedules. Any changes to these schedules will result in a necessary adjustment to the savings calculation and guaranteed savings.

Weston Library Example

Existing HVAC Schedule Significantly Exceeds Building Occupancy Schedule



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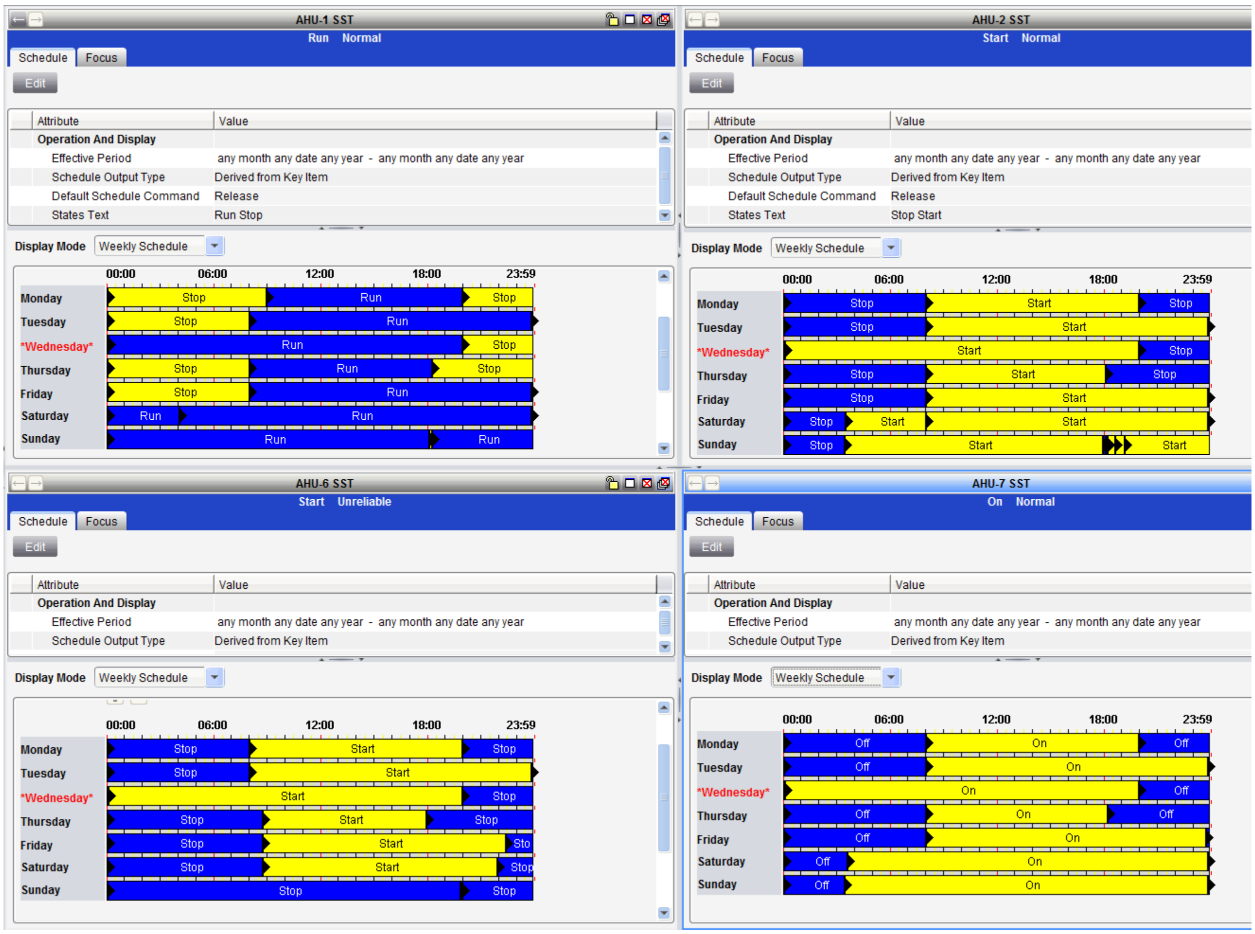
African American Library Example

Existing HVAC Schedule Significantly Exceeds Building Occupancy Schedule



Energy Savings:

Optimizing the HVAC schedules to closely align with the building schedules, will reduce the heating and cooling loads experienced by the HVAC equipment, thus reducing the annual energy consumption and expenditures.

O&M Impact/Benefits:

A reduction in the amount of HVAC operating time will reduce the wear on the fans, pumps, motors, and ancillary HVAC equipment, and consequently, prolong the service life of the unit.

Standards of Control Tables are on the following pages. These are applicable to all sites that are receiving any Controls upgrades.

Broward County

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Consultant Services, Energy Audit and Performance Consultant Services:
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STANDARDS OF CONTROL - APPLICABLE SITES

1/17/2018

			EXISTING								PROPOSED							
							Heating		Cooling						Heating		Cooling	
Building/Area Served	Schedule	Equipment	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied
West Lake/Anne Kolb NC																		
Visitor Center	1	AHU-1	24/7	24/7		M-Su	70	65	73	N/A	6:00	19:00	Yes	M - F	70	60	74	80
											6:00	19:00		Sa,Su				
Visitor Center	2	AHU-2	24/7	24/7		M-Su	70	65	73	N/A	6:00	19:00	Yes	M - F	70	60	74	80
											6:00	19:00		Sa,Su				
Mangrove Hall	3	AHU-3	24/7	24/7		M-Su	70	65	73	N/A	6:00	19:00	Yes	M - F	70	60	74	80
											6:00	19:00		Sa,Su				
Mangrove Hall	4	AHU-4	24/7	24/7		M-Su	70	65	73	N/A	6:00	19:00	Yes	M - F	70	60	74	80
											6:00	19:00		Sa,Su				
Exhibit Hall	5	AHU-5	24/7	24/7		M-Su	70	65	74	N/A	6:00	19:00	Yes	M - F	70	60	74	80
											6:00	19:00		Sa,Su				
Exhibit Hall	6	AHU-6	24/7	24/7		M-Su	70	65	73	N/A	6:00	19:00	Yes	M - F	70	60	74	80
											6:00	19:00		Sa,Su				
African American Library																		
Stage	1	AHU-1	9:00	20:00		M	68	OFF	70	OFF	10:00	20:00	Yes	M,W	70	60	74	80
			8:00	Midnight		Tu,F	68	OFF	70	OFF	8:00	18:00		Tu,Th,F,Sa,Su	70	60	74	80
			Midnight	20:00		W	68	OFF	70	OFF								
			8:00	16:00		Th	68	OFF	70	OFF								
			24/7	24/7		Sa,Su	68	OFF	70	OFF								
Auditorium	2	AHU-2	8:00	20:00		M	68	OFF	70	OFF	10:00	20:00	Yes	M,W	70	60	74	80
			8:00	Midnight		Tu,F	68	OFF	70	OFF	8:00	18:00		Tu,Th,F,Sa,Su	70	60	74	80
			Midnight	20:00		W	68	OFF	70	OFF								
			8:00	18:00		Th	68	OFF	70	OFF								
			24/7	24/7		Sa,Su	68	OFF	70	OFF								
Seminar	3	AHU-3	24/7	24/7		M,Tu,W,Th,F,Sa	68	OFF	71	OFF	10:00	20:00	Yes	M,W	70	60	74	80
											8:00	18:00		Tu,Th,F,Sa,Su	70	60	74	80
Lobby	4	AHU-4	24/7	24/7		M,Tu,W,Th,F,Sa	70	OFF	72	OFF	10:00	20:00	Yes	M,W	70	60	74	80
											8:00	18:00		Tu,Th,F,Sa,Su	70	60	74	80
Exhibit Hall	5	AHU-5	24/7	24/7		M,Tu,W,Th,F,Sa	63	OFF	63	OFF	24/7	24/7		M,Tu,W,Th,F,Sa	70	OFF	70	OFF
Exhibit Hall	6	AHU-5A (Backup)	OFF	OFF		M,Tu,W,Th,F,Sa,Su												
Dressing Room	7	AHU-6	8:00	20:00		M	70	OFF	70	OFF	10:00	20:00	Yes	M,W	70	60	74	80
			8:00	Midnight		Tu	70	OFF	70	OFF	8:00	18:00		Tu,Th,F,Sa,Su	70	60	74	80
			Midnight	20:00		W	70	OFF	70	OFF								
			9:00	18:00		Th	70	OFF	70	OFF								
			9:00	22:00		F,Sa	70	OFF	70	OFF								
			Off	Off		Su												
Youth Services	8	AHU-7	8:00	20:00		M	70	OFF	72	OFF	10:00	20:00	Yes	M,W	70	60	74	80
			8:00	Midnight		Tu,F	70	OFF	72	OFF	8:00	18:00		Tu,Th,F,Sa,Su	70	60	74	80
			Midnight	20:00		W	70	OFF	72	OFF								
			8:00	18:00		Th	70	OFF	72	OFF								
			4:00	Midnight		Sa,Su	70	OFF	72	OFF								
General Collection	9	AHU-8	8:00	20:00		M	70	OFF	71	OFF	10:00	20:00	Yes	M,W	70	60	74	80
			8:00	Midnight		Tu,F	70	OFF	71	OFF	8:00	18:00		Tu,Th,F,Sa,Su	70	60	74	80
			Midnight	20:00		W	70	OFF	71	OFF								
			8:00	18:00		Th	70	OFF	71	OFF								
			4:00	Midnight		Sa	70	OFF	71	OFF								
			4:00	23:00		Sa	70	OFF	71	OFF								
Archives	10	AHU-9	24/7	24/7		M,Tu,W,Th,F,Sa	68	OFF	68	OFF	24/7	24/7		M,Tu,W,Th,F,Sa	70	OFF	70	OFF
Archives	11	AHU-9A (Backup)	OFF	OFF		M,Tu,W,Th,F,Sa,Su												

Broward County

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			EXISTING								PROPOSED							
							Heating		Cooling						Heating		Cooling	
Building/Area Served	Schedule	Equipment	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied
West Regional Library																		
AHU-R1: Grnd FL West	1	AHU-R1, R2, R3, R4	8:00	22:00		M - Tu	68-70	65	72-74	78	8:00	20:00	Yes	M - W	70	60	74	80
AHU-R2: Grnd FL East			8:00	20:00		W,Th,Sa,Su	68-70	65	72-74	78	8:00	18:00		Th - Su	70	60	74	80
AHU-R3: 2nd FL SW			7:00	20:00		F	68-70	65	72-74	78								
AHU-R4: 2nd FL SE																		
	2	AHU-R5, R6	8:00	21:45		M - Tu	68-70	65	72-74	78	8:00	20:00	Yes	M - W	70	60	74	80
AHU-R5: 2nd FL North			8:30	20:00		W,Th,Sa,Su	68-70	65	72-74	78	8:00	18:00		Th - Su	70	60	74	80
AHU-R6: AHU-R5 OA			7:30	20:00		F	68-70	65	72-74	78								
Various	3	OAF-1, 2, 3, 4, 5, 6 &									10:00	20:00	No	M - W				
		EF-1, 2, 3, 4, 5, 6, 8, 9, 10									10:00	18:00		Th - Su				
Northwest Regional Library																		
Library 1st Floor	1	AHU-1	24/7	24/7		M-Su	68-70		72-74		8:00	20:00	Yes	M - W	70	60	74	80
											8:00	18:00		Th - Su	70	60	74	80
Receiving 1st Floor	2	AHU-2	8:30	20:15		M,W	68-70	65	72-74	78	8:00	20:00	Yes	M - W	70	60	74	80
			6:15	20:15		Tu	68-70	65	72-74	78	8:00	18:00		Th - Su	70	60	74	80
			5:45	18:15		Th	68-70	65	72-74	78								
			8:30	18:15		F,Sa,Su	68-70	65	72-74	78								
Multi-Purpose 1st Floor	3	AHU-3	6:30	20:15		M-F	68-70	65	72-74	78	8:00	20:00	Yes	M - W	70	60	74	80
			8:00	21:45		Sa	68-70	65	72-74	78	8:00	18:00		Th - Su	70	60	74	80
			9:00	20:30		Su	68-70	65	72-74	78								
Library 2nd Floor	4	AHU-4	24/7	24/7		M-Su	68-70	65	72-74	78	8:00	20:00	Yes	M - W	70	60	74	80
											8:00	18:00		Th - Su	70	60	74	80
Staff/Quiet 1st Floor	5	AHU-5	9:00	20:00		M	68-70	65	72-74	78	8:00	20:00	Yes	M - W	70	60	74	80
			6:45	20:00		Tu	68-70	65	72-74	78	8:00	18:00		Th - Su	70	60	74	80
			8:30	20:00		W	68-70	65	72-74	78								
			6:30	18:00		Th	68-70	65	72-74	78								
			9:00	10:00		F,Sa,Su	68-70	65	72-74	78								
Various	6	SF-1, 2 &									10:00	20:00	No	M - W				
		EF-1,3,4,6,7,8									10:00	18:00		Th - Su				
Weston Library																		
1st Floor	1	AHU-1	5:00	22:00		M-F	68-70	65	72-74	78	8:00	20:00	Yes	M - W	70	60	74	80
			9:00	22:00		Sat	68-70	65	72-74	78	8:00	18:00		Th - Su	70	60	74	80
			Off	Off		Sun					Off	Off		Su				
1st Floor	2	AHU-2	5:00	22:00		M-F	68-70	65	72-74	78	8:00	20:00	Yes	M - W	70	60	74	80
			9:00	22:00		Sat	68-70	65	72-74	78	8:00	18:00		Th - Su	70	60	74	80
			Off	Off		Sun					Off	Off		Su				
2nd Floor	3	AHU-3	5:00	22:00		M-F	68-70	65	72-74	78	5:00	22:00	Yes	M - F	70	60	74	80
			9:00	22:00		Sat	68-70	65	72-74	78	Off	Off		Sa - Su				
			Off	Off		Sun												
Various	4	Exhaust Fans 1-4	5:00	22:00		M-F	68-70	65	72-74	78	10:00	20:00	No	M - Sa	70	60	74	80
			9:00	22:00		Sat	68-70	65	72-74	78	Off	Off		Su				
			Off	Off		Sun												
Lauderdale Lakes Library																		
Main Library	1	AHU-1	7:30	19:00		M,W,Sa	68-70	60	72-74	82	8:00	18:00	Yes	M,W,F,Sa	70	60	74	82
			9:30	21:00		Tu,Th	68-70	60	72-74	82	10:00	20:00		Tu,Th	70	60	74	82
			7:30	18:00		F	68-70	60	72-74	82	Off	Off		Su				
			Off	Off		Su												
Multi-Purpose Room	2	AHU-2	5:30	23:00		M-Su	68-70	60	72-74	82	8:00	23:00	Yes	M - Su	70	60	74	82
Various	3	EF-1, EF-2	Interlocked with Light Switch								10:00	18:00	No	M,W,F,Sa				
											12:00	20:00		Tu,Th				
											Off	Off		Su				

Broward County

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			EXISTING				Heating		Cooling		PROPOSED				Heating		Cooling	
Building/Area Served	Schedule	Equipment	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied
Stirling Road Library																		
Library	1	AHU-1	24/7	24/7		M-Su	68-70		72-74		8:00	18:00	Yes	Su,M,F,Sa	70	60	74	80
											10:00	20:00		Tu,Th	70	60	74	80
											Off	Off		W				
Various	2	EF-1, EF-2	Interlocked with Light Switch								10:00	18:00	No	M,W,F,Sa				
											12:00	20:00		Tu,Th				
											Off	Off		Su				
Tres Pearl Library																		
Main Library	1	AHU-1	24/7	24/7		M-Su	68-70		72-74		8:00	18:00	Yes	M,Th,F,Sa	70	60	74	80
											10:00	20:00		Tu,W	70	60	74	80
											Off	Off		Sun				
Multi-Purpose Room	2	AHU-2	24/7	24/7		M-Su	68-70		72-74		8:00	18:00	Yes	M,Th,F,Sa	70	60	74	80
											10:00	20:00		Tu,W	70	60	74	80
											Off	Off		Sun				
Various	3	EF-1, 2, 3 & OAF-1	Interlocked with AHU or Light Switch								10:00	18:00	No	M,Th,F,Sa				
											12:00	20:00		Tu,W				
											Off	Off		Sun				
Margate Library																		
Main Library	1	AHU-1	24/7	24/7		M-Su	70		72		8:00	18:00	Yes	M,W,F,Sa	70	60	74	80
											10:00	20:00		Tu,Th	70	60	74	80
											Off	Off		Su				
Multi-Purpose Room	2	AHU-2	24/7	24/7		M-Su	68-70		72		8:00	18:00	Yes	M,W,F,Sa	70	60	74	80
											10:00	20:00		Tu,Th	70	60	74	80
											Off	Off		Su				
Various	3	EF-2, 3, 4, & OAF-1,2	Interlocked with AHU								10:00	18:00	No	M,W,F,Sa				
											12:00	20:00		Tu,Th				
											Off	Off		Su				
Carver Ranches Library and Family Success Center																		
Carver Ranches Library	1	AHU-1	9:30	20:00		M,W	70	65	72	78	10:00	20:00	Yes	M,W	70	60	74	80
			8:00	18:00		Tu,Th,F,Sa					8:00	18:00		Tu,Th,F,Sa	70	60	74	80
			Off	Off		Su					Off	Off		Su				
Carver Ranches Library	2	OAF-1 & TEF-1, 2	Wall Switch or interlock with Light Switch								12:00	20:00	No	M,W				
											10:00	18:00		Tu,Th,F,Sa				
											Off	Off		Su				
Family Success Center	1	RTU (ALL)	24/7	24/7		M-Su	70		72		7:00	17:00	Yes	M,W,F	70	60	74	80
											7:00	18:30		Tu,Th	70	60	74	80
											Off	Off		Sa,Su				
NW Pompano Branch Library																		
Main Library	1	AHU-1	6:30	21:00		M,W	70	65	72	78	10:00	20:00	Yes	M,W	70	60	74	80
			6:30	19:00		Tu,Th,F					8:00	18:00		Tu,Th,F,Sa	70	60	74	80
			7:30	19:00		Sa,Su					Off	Off		Su				
Various		EF-1, 2 & OAF-1	Interlocked with AHU or Light Switch								12:00	20:00	No	M,W				
											10:00	18:00		Tu,Th,F,Sa				
											Off	Off		Su				
North Regional Courthouse																		
Various	1	AHU-1, 2, 5, 9, 10 (assumed same HVAC Sch as SRCW)	6:30	20:00		M - F	70	65	73	80	6:00	19:00	Yes	M - F	70	60	74	80
			Off	Off		Sa,Su					Off	Off		Sa,Su				
Various	2	AHU-3, 4, 6, 7, 8, 11, 12, 13, 14, 15	24/7	24/7		M-Su	70	65	N/A	N/A	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su				
Various	3	OAF-1, 2, 3, 4, 5, 6 & EF-1, 2, 3, 4, 5, 6, 8, 9, 10									6:00	19:00	No	M - F				
											Off	Off		Sa,Su				

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Building/Area Served	Schedule	Equipment	EXISTING Start	EXISTING Stop	EXISTING Opt Start	EXISTING Days	EXISTING Heating Occupied	EXISTING Heating Unoccupied	EXISTING Cooling Occupied	EXISTING Cooling Unoccupied	PROPOSED Start	PROPOSED Stop	PROPOSED Opt Start	PROPOSED Days	PROPOSED Heating Occupied	PROPOSED Heating Unoccupied	PROPOSED Cooling Occupied	PROPOSED Cooling Unoccupied
Government Center West																		
1st FL West	1	AHU-1	6:00	19:00		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			Off	Off		Sa,Su					Off	Off		Sa,Su		60		80
2nd FL West	2	AHU-2	5:00	19:30		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			Off	Off		Sa,Su					Off	Off		Sa,Su		60		80
3rd FL West	3	AHU-3	5:00	22:30		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			6:30	14:30		Sa,Su	70	OFF	74	OFF	Off	Off		Sa,Su		60		80
4th FL West	4	AHU-4	5:30	21:30		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			6:30	13:30		Sa,Su	70	OFF	74	OFF	Off	Off		Sa,Su		60		80
1st FL East	5	AHU-5	5:00	19:30		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			5:30	19:00		Sa	70	OFF	74	OFF	Off	Off		Sa,Su		60		80
			Off	Off		Su												
2nd FL East	6	AHU-6	5:00	22:30		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			6:00	18:30		Sa,Su	70	OFF	74	OFF	Off	Off		Sa,Su		60		80
3rd FL East	7	AHU-7	5:00	20:00		M - Su	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
4th FL East	8	AHU-8	5:30	21:30		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			Off	Off		Sa,Su					Off	Off		Sa,Su		60		80
Lobby/Atrium	9	AHU-9, AHU-10, AHU-11, AHU-12	6:00	20:00		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			7:00	18:00		Sa	70	OFF	74	OFF	Off	Off		Sa,Su		60		80
			Off	Off		Su												
OA Chases	10	RTU-1, RTU-2	5:30	20:30		M - F	70	OFF	74	OFF	6:00	19:00	Yes	M - F	70	60	74	80
			7:30	18:30		Sa	70	OFF	74	OFF	Off	Off		Sa,Su		60		80
			Off	Off		Su												
Public Safety Complex - Public Safety Building																		
1st FL - NE Quadrant	1	AHU-1	24/7	24/7		M-Su	70	70	72	72	6:00	22:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
1st FL - SE Quadrant	2	AHU-2	24/7	24/7		M-Su	70	70	72	72	6:00	22:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
1st FL West	3	AHU-3	24/7	24/7		M-Su	70	70	72	72	6:00	22:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
1st FL West (Records)	4	AHU-4	24/7	24/7		M-Su	70	70	72	72	24/7	24/7	No	M-Su	70	70	74	74
*Per Staff (Only 24/7 Area)																		
2nd FL East	5	AHU-5	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
*Escalators Off at 6:30PM											Off	Off		Sa,Su		60		80
2nd FL East	6	AHU-6	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
*Escalators Off at 6:30PM											Off	Off		Sa,Su		60		80
2nd FL West	7	AHU-7	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
*Escalators Off at 6:30PM											Off	Off		Sa,Su		60		80
2nd FL West	8	AHU-8	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
*Escalators Off at 6:30PM											Off	Off		Sa,Su		60		80
2nd FL West	9	AHU-9	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
*Escalators Off at 6:30PM											Off	Off		Sa,Su		60		80
2nd FL West	10	AHU-10	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
*Escalators Off at 6:30PM											Off	Off		Sa,Su		60		80
3rd FL East	11	AHU-11	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
3rd FL East	12	AHU-12	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
3rd FL West	13	AHU-13	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80

Broward County

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Part Two - Investment Grade Audit Report

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			EXISTING								PROPOSED							
							Heating		Cooling						Heating		Cooling	
Building/Area Served	Schedule	Equipment	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied
Public Safety Complex - Public Safety Building (CONTINUED)																		
3rd FL West	14	AHU-14	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
4th FL West	15	AHU-15	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
4th FL West	16	AHU-16	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
5th FL West	17	AHU-17	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
5th FL West	18	AHU-18	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
1st FL West	19	AHU-19	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
2nd FL Roof	20	RTU-1	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
5th FL Roof	21	RTU-2	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
5th FL Roof	22	RTU-3	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
5th FL Roof	23	RTU-4	24/7	24/7		M-Su	70	70	72	72	6:00	19:00	Yes	M - F	70	60	74	80
											Off	Off		Sa,Su		60		80
Various	24	EF-1 thru EF-38 SF-1 thru SF-9	Intended to Interlock with Various other HVAC Components/Schedules								Re-establish interlocks and functionality to original design intent.							
5th and 3rd FL Roofs	25	CACU-1 thru CACU-10	Local Control by IT Department								Local Control by IT Department							
3rd FL Roof	26	Kitchen MAU-1/SF-3	Local Control at Hood								5:00	17:00	No	M - F	N/A	N/A	N/A	N/A
											Off	Off		Sa,Su	N/A	N/A	N/A	N/A
Public Safety Complex - Logistics Warehouse																		
Entire Building	1	AHU-1	24/7	24/7	No	M-Su	70		72-74		6:00	20:00	No	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80
Public Safety Complex - Tactical Training Building																		
Training Area	1	AHU-1	24/7	24/7	No	M-Su	70		72-74		6:00	20:00	Yes	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80
Admin Area	2	AHU-2	24/7	24/7	No	M-Su	70		72-74		6:00	20:00	Yes	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80
South Area 1	3	RTU-1	24/7	24/7	No	M-Su	70		72-74		6:00	20:00	Yes	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80
South Area 2	4	RTU-2	24/7	24/7	No	M-Su	70		72-74		6:00	20:00	Yes	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80
Public Safety Complex - Central Supply Building																		
Entire Building	1	AHU-1	24/7	24/7	No	M-Su	70		72-74		6:00	20:00	Yes	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80

Broward County

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			EXISTING								PROPOSED							
							Heating		Cooling						Heating		Cooling	
Building/Area Served	Schedule	Equipment	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied	Start	Stop	Opt Start	Days	Occupied	Unoccupied	Occupied	Unoccupied
Public Safety Complex - BSO Warehouse																		
1st FL West (Office Area)	1	RTU-1	24/7	24/7	No	M-Su	70		71		6:00	20:00	Yes	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80
1st FL Northeast (Detention)	2	RTU-2	24/7	24/7	No	M-Su	70		71		24/7	24/7	No	M-Su	70		74	
1st FL Southeast (DUI)	3	RTU-3	24/7	24/7	No	M-Su	70		71		24/7	24/7	No	M-Su	70		74	
2nd FL Northwest	4	RTU-4	24/7	24/7	No	M-Su	70		71		6:00	20:00	Yes	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80
2nd FL Southeast	5	RTU-5	24/7	24/7	No	M-Su	70		71		6:00	20:00	Yes	M - F	70	60	74	80
											OFF	OFF		Sa, Su	70	60	74	80
Various	6	EF-1, 2, 3, 4, 5, 6, 8, 9, 10, 11	Intended to Interlock with Various other HVAC Components/Schedules								Re-establish interlocks and functionality to original design intent.							

MECHANICAL UPGRADES

OpTerra performed an audit of all existing HVAC equipment and controls for the buildings identified in Group B. Much of the HVAC equipment consists of package roof-top units or split DX units. The larger facilities have air-cooled chillers and a few of the facilities have chilled water and hot water central plants. The existing equipment was evaluated and noted as to age, efficiency, and reliability. Once all equipment was evaluated, the OpTerra team then proceeded with developing practical solutions to fix any underlining problems and areas that stand out for potential energy savings.

During the audit, it was noted that the County's facilities are generally well-maintained and routine preventive maintenance is performed on a regular basis, which extends the service life of the equipment. However, some facilities had equipment that was very near, if not exceeding, its useful life and, where applicable, is recommended for replacement.

Benefits of these ECMs include:

- Reduction in electric consumption
- Improved occupant comfort
- Deferred maintenance benefits
- Operational savings
- Increased reliability
- Many support the 5-year CIP

ECM M-1: Install New Chiller

ECM Description:

This ECM considers replacing older chillers that are approaching the end of their useful service lives with new similar-sized chillers that have a higher coefficient of performance and offer greater energy savings.

In some cases, the existing chillers are using older Chlorofluorocarbon (CFC) or Hydro-chlorofluorocarbon (HCFC) refrigerants that are more harmful to the Ozone layer - than newer, Hydrofluorocarbon (HFC) refrigerants. Furthermore, these same refrigerants are no longer produced for this very reason, and the replacement cost of the refrigerant has risen steadily since going out of production. This proposal includes replacing the existing chillers with new, more efficient and environmentally refrigerant, R-134A chillers, in the same respective locations.

The installation of the new chiller will include the following scope of work:

- Provide and install a new same size (tonnage) replacement chiller in the same location.
- Provide water cooled chillers located at the NRCH with integrated variable frequency drive (VFD).
- Provide new air-cooled chillers at the Northwest Regional Library and Margate Library.
- Provide and install the necessary interconnecting chiller and condenser water piping to the new chiller.
- Reconnect the existing water treatment system for the new chiller.
- Reconnect the existing electrical power wiring to the new chiller.
- Provide and install control wiring from the new chiller to the existing building automation system (BAS).
- Connect and test chiller controls to BAS.
- Perform leak testing of the new installation.
- Perform factory start-up of the new chiller according to the manufacturer’s requirements.
- Perform commissioning of the new chiller.

Energy Savings:

The new chillers offer higher efficiencies and better part-load operation than their predecessors. The selection of the new chiller and its options will be made after the building is modeled and profiles have been developed. Final selection of options will be made during design phase.

O&M Impact/Benefits:

The maintenance costs for chillers increases with age and generally becomes more significant as they approach the end of their useful life span. OpTerra recommends the installation of these new chillers to provide the building occupants with better comfort during times of extreme temperature conditions and improved chiller plant reliability.

Chiller replacements:

This ECM will replace each of the chillers listed below with new units matching the capacity (tonnage) and type (water or air-cooled) of the existing units. The new units will also meet or exceed current ASHRAE 90.1 and IECC efficiency standards. Additionally, units to be replaced use R-22 or R-11 refrigerants, which are harsher to the Ozone layer, and no longer produced, with new replacement chillers are less harmful to the Ozone layer, Hydrofluorocarbon (HFC) refrigerants.

Building	Tag	Manufacturer	Model	Serial	Type	Tons	Refrigerant	Year
NRCH	CH-1	YORK	YT B1 B2 B3 - CG E	YGXM-561834	Centrifugal	200	R-11	1995
Margate Lib.	CH-1	Carrier	30RAN050K-E511AL	2304F38848	Air-Cooled	50	R-22	2004
NW Regional Lib.	CH-1	Trane	RTAA1004XL01A3D0BF0	U00D08427	Air-Cooled	100	R-22	2000
NW Regional Lib.	CH-2	Trane	RTAA1004XL01A3D0BF0	U00D08426	Air-Cooled	100	R-22	2000

Replacement Units (NRCH):

York water-cooled 200-ton centrifugal chiller model # YK2CRQ3 with VFD drive and R134A refrigerant.

The chillers feature: High efficiency- designed for maximum part load efficiency, Chlorine-free HFC-134a refrigerant, Improve Sustainability – Falling-film evaporator reduces refrigerant charge up to 40%, Easy Operation – The OptiView™ Control Center, OptiView Control Center panel can easily integrate with a BAS through a BACnet interface.

Warranty: One year from start-up or 18 months from shipment, Compressor limited warranty 5 years.

Replacement Unit (Northwest Regional Library and Margate Library):

Carrier 100-ton air-cooled chiller model #30RAP1006FC coated condenser coils and R410A refrigerant.

Carrier 50-ton air-cooled chiller model #30RAP0505FC coated condenser coils and R410A refrigerant.

The chiller features: Full-load EER values up to 10.5 and IPLV values up to 15.8, ASHRAE 90.1 compliant / AHRI 550/590 certified, High-efficiency rotary scroll compressors,

Warranty: One year from start-up or 18 months from shipment on all other parts.

ECM M-4: Install New Condenser Unit & Evaporator Coil

ECM Description:

This ECM will replace the R-22 (HCFC) cooling system by installing a new exterior condensing unit, new evaporator coil and associated expansion valve. These units are causing maintenance issues or no longer meet sufficient cooling requirements for the buildings. In addition, these condenser units are utilizing older refrigerants HCFC, which are gradually being phased out of the industry. Due to the life expectancy of the equipment and the type of refrigerant used, OpTerra recommends replacing these condenser units with newer, more energy efficient models that use R-410A HFC refrigerant. The Air Handling Units (AHU) on these systems were in relatively good condition - and by replacing only the evaporator coil, the system can operate on R-410A refrigerant.

The deterioration of these condensing units is causing growing maintenance problems, and they no longer heat or cool as effectively as they once did. AHU reconditioning on these units was determined to offer a more economical alternative, rather than replacing the unit entirely.

OpTerra will perform the following scope of work with the replacement of the condenser unit and installing new evaporator coil & expansion valve.

- Demolish and remove the existing condenser unit from the site. Recover the existing refrigerant and properly dispose of it.
- Provide and install a same size (ton) condenser unit in the same respective location.
- Reconnect the existing refrigerant piping after the replacement condenser unit has been installed.
- Reconnect the existing power wiring after the replacement unit has been installed.
- Perform start-up of the new condenser unit to confirm proper operation.
- Demolish the existing evaporator coil and expansion valve.
- Install new evaporator coil and expansion valve at the AHU.
  Note: If the existing coil is in good condition and CU manufacturer accepts the coil of being capable of being used with the Condensing Unit (CU), then the coil is cleaned and reused. (This exception is for units listed below for TY Park, Fern Forest and Long key)
- Perform air balancing at the unit's fan upon installation.
- Start-up and commissioning of the AHU.

Energy Savings:

This ECM evaluated replacing existing condenser units that have exceeded their useful life expectancy, and/or, are not as efficient as current technology with newer, more efficient units. These savings will be achieved by installing new replacement units with a lower kilowatt (kW) per ton than the existing units. Furthermore, replacement of the existing evaporator coil at the corresponding AHU will also provide Broward County with increased energy savings.

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O&M Impact/Benefits:

Replacing dated and problematic condenser units, and old evaporator coils on selected units that are beyond their useful lives will reduce maintenance costs, improve system reliability, and use a more environmentally-friendly HFC refrigerant, such as R-410A.

Condensing Units & Evaporator coils be replaced:

This ECM will replace the HCFC - R-22 refrigerant cooling system by installing a new exterior condensing unit, new evaporator coil and associated expansion valve. The refrigerant lines will be reused, provided they are tested for leaks, flushed, and meet the size and pressure requirements for the new units. Verification from the equipment manufacturer will be obtained so that the existing line sizes and length will not void the new equipment warranty. The new unit's capacity shall match the existing unit and meet current ASHRAE 90.1 and IECC standards.

ID	Site	Building	Tag	Make	Model	Tons	Refrigerant	Year
BL26	Carver Ranches	Main	CU-1A	Trane	TTA240B300FA	20	R-22	2005
BL26	Carver Ranches	Main	CU-1B	Trane	TTA180B300FA	15	R-22	2005
BO28	Safety Building	Cntr Supply	CU-1.1	Carrier	38AKS016-K621	15	R-22	2008
BO28	Safety Building	Cntr Supply	CU-1.2	Carrier	38AKS016-K621	15	R-22	2008
BL16	Northwest Regional	Main	AC-1	Trane	TTP030D100A0	2.5	R-22	2000
BL16	Northwest Regional	Main	AC-2	Trane	TTP024C100A3	2	R-22	2000
BL17	Weston Lib	Main	ACCU-1	Rheem	13AJA18A01	1.5	R-22	2009
BL17	Weston Lib	Main	ACCU-3	Rheem	13AJA18A01	1.5	R-22	2009
BL20	North Lauderdale	Main	CU-1A	Trane	RAUCC404B	40	R-22	Unk
BL20	North Lauderdale	Main	CU-1B	Trane	RAUCC504B	50	R-22	Unk
BL23	Hallandale Lib.	Main	CU-2	Rheem	RAKB-060CAZ	5	R-22	2007
BL23	Hallandale Lib.	Main	CU-3	Ruud	RAWD-100CAZ	10	R-22	2005
BL23	Hallandale Lib.	Main	CU-4	Rheem	RAWD-091CAZ	7	R-22	2007
BH38	SATC	Main	CU-3	Ruud	UAKB--060CAZ	5	R-22	2007
BH40	EAP Our House	Main	CU-1	Ruud	13AJA30A01757	2.5	R-22	2011
BR41	Mass Transit N	Bldg 2	CU-1	International Comfort	R2A360GHR200	3	R-22	2014
BR41	Mass Transit N	Bldg 4	CU-2	Trane	TTA120A400FA	10	R-22	2007
BR44	Mosquito Control	Office	CU-1	Rheem	RAWD-078CAZ	6.5	R-22	2007
BR45	South Maint Shop	Bldg A	CU-1	Goodman	CLJ60-1	5	R-22	2006
BR45	South Maint Shop	Bldg C	CU-1	Goodman	GSC030361DE	3	R-22	2007
BP2	TY Park	Maintenance	CU-1	York	H2RD0428068	3.5	R-22	2006
BP2	TY Park	Campground	CU-1	AAON	CA1277	6	R-22	2007
BP8	Fern Forest	Main	CU-1	Trane	2TTA2048A3000	4	R-22	2005
BP8	Fern Forest	Main	CU-2	Trane	2TTA2048A3000	4	R-22	2005
BP5	Long Key	Visitor Center	AC-3A	Carrier	24ABR342A610	3.5	R-22	2007
BP5	Long Key	Visitor Center	AC-3B	Carrier	24ABR342A610	3.5	R-22	2007
BP5	Long Key	Visitor Center	AC-4	Carrier	38ARD012-601	8.7	R-22	2007
BP5	Long Key	Visitor Center	AC-5	Carrier	38ARZ008-601	7	R-22	2007
BP5	Long Key	Visitor Center	AC-6	Carrier	38ARD024-601	18.1	R-22	2007
BP5	Long Key	Visitor Center	AC-7	Carrier	24ABR336A3	3	R-22	2007

Replacement Units:

Carrier, Daikin or equal Commercial High Efficiency Condensing Unit (R-410A).

The condensing units feature: Energy-efficient compressor • Quiet operating top discharge • High-efficiency copper tube / aluminum fin coil • Brass liquid and suction service motor-compressor valves • High- and low-pressure switches • Factory-installed filter drier • Complies with ASHRAE 90.1-2007 • AHRI Certified; ETL Listed

Condenser Unit Warranty: One year from start-up or 18 months from shipment on all other parts. 4-year on motor-compressor parts.

ECM M-4B: Install New Condenser Unit & New AHU (Split Systems)

ECM Description:

During the survey of the buildings, OpTerra engineers observed that some of the existing condenser units and air handling units (AHUs) are beyond their useful lives and need replacement. The operating efficiency of these units has declined over time, and in some cases, no longer meet the cooling or heating requirements of the buildings.

Some of the condenser units are utilizing older refrigerants HCFC R-22, which are gradually being phased out of the industry due to their Ozone depleting factors. Due to the life expectancy of the equipment and the type of refrigerant used, OpTerra proposes to replace these condenser units and AHUs with newer, more energy efficient models that use more environmentally friendly, HFC R-410A refrigerant.

Furthermore, some of the existing AHUs are beyond their normal useful lives. These units were evaluated economically for reconditioning, but it was determined that replacing the condensing and indoor units was preferable.

OpTerra will perform the following scope of work during the replacement of these condenser and air handling units:

- Demolish and remove the existing condenser unit and AHU from the site. Recover the existing refrigerant and properly dispose of it.
- Provide and install a new same size (tons) condenser unit and AHU in the same respective locations.
- Reconnect the existing refrigerant piping after the replacement condenser unit has been installed. Replace the piping if required by the manufacture to maintain high efficiency rating and warranty.
- Reconnect the existing heater and ductwork after the replacement AHU has been installed.
- Reconnect the existing power wiring after the replacement units have been installed.
- Reconnect the existing control wiring after the replacement units have been installed.
- Perform start-up of the new condenser unit and AHU to confirm proper operation.

Energy Savings:

This ECM considers replacing existing condenser units and AHUs that have exceeded their useful life expectancy, and are not as efficient as current technology, with newer, higher efficiency units. These savings will be achieved by installing new replacement condenser units with a lower kW per ton efficiency than the existing units. In addition, replacement of the existing supply fan at the corresponding AHUs will also provide Broward County with increased energy savings.

O&M Impact/Benefits:

Replacing old and inefficient equipment will reduce maintenance costs, improve system reliability, and improve the overall comfort level in the building. Replacing these existing units will also reduce the amount of maintenance time and money spent on repairs inherent with older HVAC equipment.

Split DX units to be replaced:

This ECM will replace the below listed split DX units (Condenser & AHU) with new units matching the capacity of the existing units. The replacement units will meet current ASHRAE 90.1 and IECC efficiency standards. All units to be replaced use HCFC R-22 refrigerant, with new replacement units using more Ozone friendly HFC R-410A.

ID	Site	Building	Air Handling Unit				Condensing Unit				
			Tag	Make	Model	Year	Tag	Make	Model	Tons	Year
BP2	TY Park	Park Office	AHU-1	Rheem	RHGE-100ZL	2003	CU-1	Rheem	RAWD-100CAZ	10	2003
BP2	TY Park	Park Office	AHU-2	Goodman	AR120AA	2008	CU-2	Goodman	GSC101203AB	10	2009
BP6	West Lake / AK	Visitor Center	AHU-1	Carrier	40RM-012-B6	1996	CU-1	Carrier	38ARS012	10	2007
BP6	West Lake / AK	Visitor Center	AHU-2	Carrier	40RM-012-B6	1996	CU-2	Carrier	38ARS012	10	2008
BP6	West Lake / AK	AK Pump Rm	AHU-7	Rheem	RBHB-24J07	2015	CU-7	Rheem	RAKA-048JAZ	4	2002
BP6	West Lake / AK	Marina	AHU-M	Carrier	40RM-008-B6	1996	CU-M	Carrier	N/A	7.5	1996

Replacement Units:

Carrier, Daikin or equal Commercial High Efficiency Condensing and AHU Unit (R-410A).

The condensing units feature: Energy-efficient compressor • Quiet operating top discharge • High-efficiency copper tube / aluminum fin coil • Brass liquid and suction service motor-compressor valves • High- and low-pressure switches • Factory-installed filter drier • Complies with ASHRAE 90.1-2007 • AHRI Certified; ETL Listed

Warranty: One year from start-up or 18 months from shipment on all other parts. 4-year on motor-compressor parts.

ECM M-5: Install New RTU

ECM Description:

This ECM is replacing several rooftop units (RTUs) throughout Broward County that have exceeded their useful life expectancy with new higher efficiency models. These units will be replaced with units that incorporate the latest technology including:

- Supply fans will consist of direct-drive plenum or air foil type fans with EC motors instead of the traditional forward curved belt-drive fans with AC motors. These units will be controlled as variable air volume units, where applicable.

The new RTUs will have the same rated heating and cooling capacities (tonnage) as the existing units unless the load evaluation during design indicates the unit is significantly over- or under-sized, in which case the capacity of the new unit will be adjusted accordingly.

The scope of work with the new RTUs will include the following:

- Demolition and removal of the existing rooftop units.
- Recover the existing refrigerant and properly dispose of it.
- Provide and install new packaged units with heating and cooling coils, as applicable, filter mixing box.
- Disconnect the power wiring during demolition and reconnect the wiring after the new units have been installed.
- Provide and install controls at the new units and integrate to the existing BAS or T-stats.
- Provide start-up and commissioning of the new units.

Energy Savings:

Energy consumption will be reduced by achieving efficiency gains with the new replacement DX cooling coil and supply fan relative to the existing RTUs.

O&M Impact/Benefits:

Replacing old and inefficient units will reduce maintenance costs, improve system reliability, and will use a more environmentally-friendly refrigerant, such as R-410A. Replacing these existing units will also reduce the amount of maintenance time and money spent on repairs inherent with older RTUs.

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Roof top or Packaged units to be replaced:

This ECM will replace the below listed RTU or Package units with new units matching the cooling capacity (tonnage) of the existing units. The replacement units will be high efficiency meeting current ASHRAE 90.1 and IECC efficiency standards. All units to be replace use HCFC R-22 refrigerant, new replacement units are HFC R-410A.

ID	Site	Building	Tag	Manufacturer	Model	Tons	Refrigerant	Year
BP8	Fern Forest	Main	RTU-1	Trane	THC092A3RCA02D2	7.5	R-22	2005
BP8	Fern Forest	Main	RTU-2	Trane	THC092A3RCA1GA	7.5	R-22	2005
BP5	Long Key	Visitor Center	AC-1	Carrier	50HJ-006-V631	5	R-22	2007
BP5	Long Key	Visitor Center	AC-2	Carrier	50HJ-014-V651	12.5	R-22	2007
BL26	Carver Ranches	Main	RTU-2	International Comfort	PAE090H000AA	7.5	R-22	2005
BL26	Carver Ranches	Main	RTU-3	Rheem	RSKA-A060CK	5	R-22	2004
BL26	Carver Ranches	Main	RTU-4	International Comfort	PAS120H00AA	10	R-22	2006
BH35	Booher Bldg.	Main	RTU-1	McQuay	RRPS050CSY	50	R-22	2008
BH35	Booher Bldg.	Main	RTU-2	McQuay	RRPS050CSY	55	R-22	2008
BH35	Booher Bldg.	Main	RTU-3	McQuay	RRPS050CSY	50	R-22	2008
BH35	Booher Bldg.	Main	RTU-4	McQuay	RRPS050CSY	55	R-22	2008
BH37	Family Success Cntr	Main	RTU-3	Trane	Unknown	7	R-22	Unk
BH37	Family Success Cntr	Main	RTU-4	Trane	Unknown	3.5	R-22	Unk
BH37	Family Success Cntr	Main	RTU-5	Trane	TCC042F300BC	4	R-22	Unk
BH37	Family Success Cntr	Main	RTU-6	Trane	TCC048F300BD	7	R-22	Unk
BH41	Family Success Cntr	Main	RTU-7	Trane	Unknown	5	R-22	Unk
BO28	Public Safety Complex	PSB	1	Trane	TCD150D400BA	12.5	R-22	2007
BO28	Public Safety Complex	PSB	2	Trane	TSC060A1B0A002L	5	R-22	2007
BO28	Public Safety Complex	PSB	3	Trane	TSC036A4E0A002	3	R-22	2007
BO28	Public Safety Complex	PSB	4	Carrier	50TM-005--V601--	4	R-22	2007

Replacement Units:

Carrier, Daikin or equal Commercial High Efficiency RTU Unit (R-410A).

The RTU units feature: Energy-efficient compressor • copper tube / aluminum fin coil • Brass liquid and suction service motor-compressor valves • High- and low-pressure switches • Factory-installed filter drier • High efficiency evaporator fan, Complies with ASHRAE 90.1-2007 • AHRI Certified; ETL Listed

Warranty: One year from start-up or 18 months from shipment on all other parts. 4-year on motor-compressor parts.

ECM M-7: Chilled Water Coil Cleaning

ECM Description:

This ECM considers cleaning the chilled water coils on the AHUs at selected libraries to increase the efficiency of the cooling system. Dirty coils, both internally and externally, reduce the heat transfer from the chilled water to the supply air of the AHU. The reduction in heat transfer increases energy consumption for cooling and can lead to uncomfortable space conditions.

OpTerra will perform the following scope of work with the chilled water cleaning:

- Spray or power wash the existing cooling coils at a low pressure with a degreasing/cleaning agent to remove the excess contaminants.
- The existing chilled water piping and control valves will remain.
- Confirm chilled water coil operation after the cleaning.

Energy Savings:

Energy savings will be realized due to an increased heat transfer at the cooling coil, and consequently, less work is required by the chiller to cool the spaces. This improvement will also lead to a reduction in required chilled water pumping, since less chilled water will be needed to cool the space.

O&M Impact/Benefits:

This ECM will allow Broward County to proactively start a regular scheduled cleaning of the cooling coils to ensure that the system will maintain its cooling efficiency. Due to the current build-up of dirt on the coils now, routine maintenance will not effectively solve the problem. This will also positively impact the chiller in that it will increase the lifecycle of the chiller due to working less hard to maintain cooling setpoints.

AHU Coils to be cleaned:

The existing Air Handling Units are nearly 20 years old and the coils appear to have a buildup of contaminants. This ECM will clean the coils. Coils shall be chemically cleaned with a solution approved by the coil manufacturer.

ID	Site	Tag	Make	Model	Motor *HP*	Cooling *Type*	*Year*
BL16	NW Regional Lib.	AHU-1	Trane	MCCA050UB000A000U	25.00	CHW	2000
BL17	NW Regional Lib.	AHU-2	Trane	MCCA006HBE0C0A0S00000	2.00	CHW	2000
BL18	NW Regional Lib.	AHU-3	Trane	MCCA012HBE0C0B0S00000	7.50	CHW	2000
BL19	NW Regional Lib.	AHU-4	Trane	N/A	30.00	CHW	2000
BL20	NW Regional Lib.	AHU-5	Trane	MCC-08 Series	5.00	CHW	2000

ECM M-8: Install New AHU

ECM Description:

This ECM is replacing AHUs that were identified for future replacement in Broward County's 2017, 5-year CIP project list. The units are now 23 years old and close to the end of their useful lives and need replacement. The operating efficiency of these units has declined over time, and in some cases, no longer meets the cooling or heating requirements of the buildings. These units were selected based on the age, condition, and in addition, are on the CIP replacement list.

Refurbishing of the units was considered, but it was determined that replacing these units was preferable.

OpTerra will perform the following scope of work with the replacement of these AHUs:

- Demolish and remove the existing AHU from the site.
- Provide and install same capacity AHUs in the same respective locations.
- Provide new AHU with VFD motor drive and with UV air purifier.
- Reconnect the existing CHW piping and ductwork after the replacement AHU has been installed.
- Reconnect the existing power wiring after the replacement unit has been installed.
- Reconnect the existing control wiring to new AHU controller.
- Perform start-up of the new AHU to confirm proper operation.
- Perform Test and Balance (TAB) for AHU (Total Supply, Total Return, and Outside Air).

Energy Savings:

This ECM considers replacing existing AHUs that have exceeded their useful life expectancy and are not as efficient as current technology, with newer, more efficient units. Replacement of the existing supply fan and control of outside air at the corresponding AHUs will also provide Broward County with increased energy savings.

O&M Impact/Benefits:

Replacing old and inefficient equipment will reduce maintenance costs, improve system reliability, and improve the overall comfort level in the building. Replacing these existing units will also reduce the amount of maintenance time and money spent on repairs inherent with older AHUs.

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AHU units to be replaced:

This ECM will replace the below listed AHU units with new units matching the capacity (tonnage) of the existing units. The replacement units will be high efficiency meeting current ASHRAE 90.1 and IECC efficiency standards. The AHU replacements will be performed in the same manner as previously replaced AHUs in the building. The project will use McQuay/Daikin AHUs with new controls for the AHU and integration to the existing building automation system (BAS).

ID	Site	Building	Tag	Make	Model	Motor *HP*	Cooling *Type*	Heating *Type*	*Year*	Area *Served*
BO29	NRCH	Main	AHU-3	Trane	CCDB21D50M	15.00	CHW	Elect. In VAV	1995	Z3 - Property Appraiser
BO29	NRCH	Main	AHU-4	Trane	CCDB14E50M	10.00	CHW	Elect. In VAV	1995	Z4 - Revenue Collection
BO29	NRCH	Main	AHU-6	Trane	CCDB17HEOM	15.00	CHW	Elect. In VAV	1995	Z6 - 2nd floor
BO29	NRCH	Main	AHU-7	Trane	CCDB12E30OM	7.50	CHW	Elect. In VAV	1995	Z7 - Surplus
BO29	NRCH	Main	AHU-8	Trane	CCDB35ME0M	20.00	CHW	Elect. In VAV	1995	Z8 - Records
BO29	NRCH	Main	AHU-11	Trane	MCCA017LCD	5.00	CHW	N/A	1995	Z11 - Warehouse #2
BO29	NRCH	Main	AHU-12	Trane	MCCA030LCD	10.00	CHW	N/A	1995	Z12 - Warehouse #3
BO29	NRCH	Main	AHU-13	Trane	LPCAF08F2DOE	3.00	CHW	Elect. 20kW	N/A	Z13 - Storage

Replacement Units:

Carrier, Daikin or equal Commercial Air Handling Unit with same air flow and cooling capacity (tons).

The AHU units feature: Energy-efficient fan motor, VFD control for fan motor, copper tube / aluminum fin coil, UV air contaminate control, High efficiency filter section (low resistance), outside air control and CO2 monitoring, Complies with ASHRAE 90.1-2007 • AHRI Certified; ETL Listed

ECM M-12: Repair Duct Leakage

ECM Description:

OpTerra engineers noted failed ductwork at AHU-3 in the Ann Kolb Nature Center and in some locations of the Public Safety Complex. At AHU-3, the supply duct connection near the ceiling where it connects to the horizontal supply main has become loose and needs repair. The gap on the top ductwork has about a 10" wide opening exposed to the mechanical room.

The scope of work to repair this ductwork will include the following:

- Disassemble rectangular elbow section on top of discharge assembly.
- Repair the 90-degree elbow, or replace if necessary.
- Reattach the elbow to supply duct and discharge column. Reinforce the elbow attachment to horizontal supply duct to prevent any future damage.
- Tape the seams between the duct connections to eliminate any air leakage.
- Test the system for air leak.

Energy Savings:

The supply duct is leaking 20-30% of its air into the mechanical room. The mechanical room is a return plenum, so the air leaking from the supply ductwork short circulates directly back to the return. This leakage reduces the amount of supply air being delivered to the space and makes the AHU work harder to maintain the static pressure setpoint. By correcting this issue, Broward County will realize greater energy savings and better AHU performance.

O&M Impact/Benefits:

The repair of the duct leakage will improve the AHU performance and overall comfort level in the space.

Repair Duct Leakage:

This ECM will repair ductwork at the below listed AHUs and locations. The repair material selected for repair will meet SMACNA Standards for duct systems.

ID	Site	Building	Tag	Repair Location	Repair description
BP6	West Lake / AK	Mangrove Hall	AHU-3	Mech Room (AHU-3)	Supply duct elbow above AHU.

ECM M-12B: Repair Duct Leakage – Smoke Dampers

ECM Description:

OpTerra engineers noted leaky smoke dampers in mechanical rooms at the Public Safety Complex. The dampers in question are in mechanical rooms connected to smoke evacuation shafts.

The outside air dampers both on the AHUs and on the Outside Air mechanical chase leak to varying extents. This leakage allows unconditioned, moist air to enter the mechanical rooms which has resulted in rust and corrosion of the equipment, also adding to the cooling load of the building. To remedy the situation, this ECM will replace all dampers along the mechanical outside air chases and the fresh air dampers on the air handling units.

The scope of work to replace the leaky smoke dampers include the following:

- Disconnect damper actuator and remove the existing dampers.
- Clean and prepare frame opening to receive new damper.
- Install new ultra-low leakage damper.
- Seal damper frame to prevent frame leaks.
- Reconnect damper actuators.
- Test the damper operation.

Energy Savings:

The reduced leakage of outside air will reduce cooling load and moisture migration into the building. By correcting this issue, Broward County will realize greater energy savings and better AHU performance.

O&M Impact/Benefits:

The replacement of dampers will improve the AHU performance and overall comfort level in the building space. By replacing the dampers there will be less moisture damage (rust) in the mechanical rooms, thereby increasing the lifecycle of the equipment.

Repair Duct Leakage:

This ECM will replace dampers at the below listed AHUs and locations. The repair material selected for repair will meet SMACNA Standards for duct systems. Dampers will be Ultra Low Leakage AMCA Class 1A (3 CFM/SF at 1" wg) and installed per manufacturers recommendation to maintain leakage class rating.

Room	Equip Tag	AHU Fresh Air Intake Damper Size		Mechanical Room Outisde Air Chase Damper Sizes			
				Damper #1		Damper #2	
		Length (in)	Width (in)	Height (in)	Width (in)	Height (in)	Width (in)
1040	AHU-1	108	30	144	72	144	96
	AHU-2	108	30				
1561	AHU-3	96	18	162	96		
	AHU-4	108	24				
2028	AHU-5	102	18	144	72	144	96
	AHU-6	102	24				
2535	AHU-7	102	20	144	96		
	AHU-8	102	18				
2556	AHU-9	48	18	Not Applicable			
	AHU-10	76	18				
3049	AHU-11	88	18	144	72	144	96
	AHU-12	94	24				
3558	AHU-13	102	24	144	96		
	AHU-14	102	24				
4536	AHU-15	96	18	144	96		
	AHU-16	96	18				
5524	AHU-17	108	24	164	102		
	AHU-18	96	24				

ECM M-13: Eliminate Uncontrolled Supply Air Diffusers in Mechanical Rooms

ECM Description:

OpTerra engineers noted very low temperatures in mechanical rooms at the Public Safety Complex. The cold temperatures cause condensation on metal surfaces and leads to corrosion issues. This ECM address over cooling in mechanical rooms.

The originally installed VAV Terminal Units that serve the mechanical rooms have been removed along with the associated ducting that ran from the main supply trunk to each VAV Box. This has resulted in uncontrolled cooling in the mechanical rooms leading to sub 65 degree Fahrenheit space temperatures, condensation, rusting, and corrosion inside the mechanical rooms. This ECM will demo existing diffusers, ducting, insulation, and supporting cables/rods where the VAVs used to be located. The openings will be capped by material matching the existing ductwork on the medium pressure supply ducts.

The scope of work to replace the leaky smoke dampers include the following:

- Remove any remaining VAV boxes and ductwork.
- Enclose the holes with matching material.
- Seal the capped opening.
- Install new insulation to match existing.

Energy Savings:

This renovation will reduce amount of supply air provided in the mechanical room and therefore will reduce cooling load of the building. By correcting this issue, Broward County will realize greater energy savings and better AHU performance.

O&M Impact/Benefits:

The capping of uncontrolled supply openings improves the AHU performance and overall comfort level in the building space. By implement this ECM there will be less moisture damage (rust) in the mechanical rooms.

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Repair Duct Leakage:

This ECM will demo existing diffusers, ducting, insulation, and supporting cables/rods where the VAVs were located. The openings will be capped by material matching the existing ductwork. The repair material selected for repair will meet SMACNA Standards for duct systems.

ID	Site	Building	Repair Location
BO28	Public Safety	PSB	Mech Rm 1024
			Mech Rm 1561
			Mech Rm 2028
			Mech Rm 2535
			Mech Rm 2556
			Mech Rm 3049
			Mech Rm 3558
			Mech Rm 4536
			Mech Rm 5524

LIGHTING UPGRADES

Introduction

OpTerra performed a detailed audit of all existing lighting equipment and lighting controls for the buildings identified in Group B. The general finding was that most of the existing lighting consists of outdated technology and there are few lighting controls. The majority of the interior lighting is linear fluorescent or compact fluorescent lamps (CFL) and/or fixtures. OpTerra also identified incandescent, halogen, and HID (high-intensity discharge) lamps and/or fixtures. Most of the exterior lighting, including the sports lighting, features HID lamps and/or fixtures. These existing conditions offer a substantial amount of potential energy savings, along with the other added benefits from upgrading to the latest lighting technology. In both interior and exterior spaces, some of the existing lamps and/or fixtures have already been upgraded to light emitting diode (LED) technology.

Recommendations

OpTerra is making several recommendations for lighting upgrades that will result in energy savings and other benefits. The recommendations have been grouped into four different sections: interior lighting, exterior lighting, sports lighting, and lighting controls.

Overall, OpTerra recommends upgrading all existing lamps and/or fixtures to LED technology. There are three ways to go about upgrading lighting to LED: lamp replacement, fixture retrofit (replacing the lamp and ballast), or complete fixture replacement.

For the interior lighting, OpTerra recommends the following:

- Lamp replacements for existing fixtures that contains CFL, incandescent, or halogen lamps.
- Retrofitting existing fixtures by replacing the lamps and ballasts with new LED tubes and new LED drivers for existing fixtures that contain linear fluorescent T8 or T12 lamps.
- New LED exit signs to replace existing exit signs not already LED.
- New LED fixture replacements for existing fixtures that have deteriorated beyond their useful life, applications where it is more cost effective to replace the entire fixture instead of retrofitting, and applications where no retrofit product is available. For deteriorated fixtures, up to 2% of the total number of fixtures will be replaced.

For the exterior lighting, OpTerra recommends the following:

- LED Lamp replacements for existing exterior fixtures with CFL lamps.
- LED ‘corn cob’ style HID retrofits for existing exterior fixtures with HID lamps.
- New LED fixture replacements for exterior fixtures that are sufficiently deteriorated beyond useful life or applications where it is more cost effective to replace the entire fixture instead of retrofitting. For deteriorated fixtures, up to 2% of the total number of fixtures will be replaced.

For lighting controls, OpTerra recommends the following:

- Installing new occupancy sensors in rooms where the lights remain on while the space is unoccupied for extended periods of time, including enclosed offices, conference rooms, and storage spaces. Approximately 20% of spaces were identified as benefitting from this technology.

Lighting products will be procured from reputable, American-based manufacturers with proven track records. The LED lighting products listed in the appendix will be installed, or their equivalent. All installed LED products will be UL listed and either Energy Star or DLC certified.

Benefits

Light-emitting diodes (LEDs) bring several advantages over the aforementioned existing light sources. These advantages include high efficiency and durability, zero mercury, and long-lasting product lifetimes. This translates into significant energy savings, maintenance savings, and an overall reduction in the cost of ownership over the product's lifetime. LED products also emit a smaller amount of heat in comparison to their fluorescent and incandescent counterparts, providing air conditioning savings in spaces that are cooled.

Outside of energy and cost related savings, there are also intangible benefits provided by LED lighting. Workers often experience distraction, headaches, and other negative impacts related to obsolete technologies like fluorescent and incandescent lighting. Unlike LEDs, fluorescent lights can flicker, buzz, and overheat—especially when nearing end of life. By contrast, LEDs experience no irritating degradation symptoms—and when they do fail, they simply turn off, instead of humming or flickering. The LED lighting proposed for this group of buildings will create a more comfortable and better-lit working environment.

Improved light quality will make employee operations safer. Research has also shown that LED lighting can positively affect employees beyond simply brightening their workspace. For example, a 2012 study[1] demonstrated a correlation between LEDs and an 8.3% improvement in visual and cognitive tasks; faster reaction times; reduced fatigue; increased vigor/activity; and lower rates of depression. These factors may make a difference for employees striving for a zero-incident workspace.

[1] Hawes, B. K., Brunyé, T. T., Mahoney, C. R., Sullivan, J. M., & Aall, C. D. (2012). Effects of four workplace lighting technologies on perception, cognition and affective state. *International Journal of Industrial Ergonomics, 42*(1), 122-128.

Benefits of these ECMs include:

- Reduction in electric consumption
- Reduction in lighting maintenance costs
- Reduction in lighting recycling costs
- Improved working environment
- Safer daily operations
- Improved light bulb lifecycle

Energy Savings

During the audit and development process, OpTerra gathered as much information as possible to limit the number of assumptions and to generate savings calculations that are as accurate as possible. At each individual site, the energy consumption data of the existing lighting equipment was observed and recorded. A sample of fixtures was opened to record the lamp and ballast information, and it was assumed that similar fixtures contain the same lamp and ballast types. The power consumption of each fixture was multiplied by the fixture quantity and then multiplied by the annual run hours to calculate annual energy usage. The proposed energy usage was then calculated by multiplying the same annual run hours by the power consumption of the proposed LED products. The total annual energy savings were calculated by subtracting the proposed usage from the existing usage.

The run hours for each building was obtained through a combination of site observations, feedback from building managers or on-site employees, and analyzing utility meter information. The run hours for different space types were separated within each building. The general space types most often found were hallways/lobbies, open office areas, enclosed offices, stairwells, exit signs, storage spaces, mechanical rooms, and exterior.

Occupancy sensors were assumed to reduce the annual run hours by 20% for the fixtures being controlled. This is true for both existing occupancy sensors and proposed occupancy sensors. A 2016 report from the U.S. Department of Energy[2] shows that occupancy sensor savings vary greatly by space type, thereby including an estimated reduction of 20%, our savings will be achievable - but conservative.

The maintenance savings were calculated based on the existing lamp and ballast types. Each existing lamp and ballast type was assigned a material cost and disposal cost based on current product prices. The average rated life for each lamp and ballast type was then divided by the annual run hours to determine the annual replacement quantity, which was then multiplied by the product costs to determine the annual cost savings. Labor savings were not included in the maintenance savings calculations.

There are some utility incentives available through Florida Power & Light Company's (FPL) current incentive program. Unfortunately, available incentives are limited and only apply to certain LED product types, which is why they are not available for every building. The incentives included in this report were current as of December 15, 2017, but could change depending on program changes from FPL.

[2] U.S. Department of Energy. (2016). Wireless Sensors for Lighting Energy Savings. https://energy.gov/sites/prod/files/2017/01/f34/wireless_occupancy_sensor_guide.pdf.

Installation Methodology & Assumptions

Following the execution of the project agreement, OpTerra will coordinate the installation schedule and timeline with the appropriate Broward County contact(s). It is expected that there will be a final design period of approximately 4 weeks following contract execution. Material lead time is expected to take up to 90 days and varies by product. The final installation schedule will vary depending on site access, crew size, and other factors, but will be finalized and agreed upon prior to starting.

An OpTerra project manager will be assigned to oversee the daily operations throughout the duration of the project and will act as the main point of contact for questions or potential issues that may arise. The OpTerra project manager will coordinate installations performed by the electrical subcontractors, and all work will be scheduled with Broward County and approved prior to proceeding.

All labor has been quoted using Florida Prevailing Wage Rates. Any building that requires night work to avoid interrupting daily operations will be accommodated accordingly.

It is assumed that storage space will be provided within each building if available. OpTerra has budgeted for storage containers to be available as needed. It is assumed that space will be allocated at each site for the storage containers. It is assumed that an electrical permit will be required at each site undergoing a lighting retrofit project. It is assumed that Broward County will provide building escorts, badges, or keys that grant access to all areas within each building that are included within the project scope of work.

For sports lighting projects, OpTerra will provide a photometric layout for all areas that feature sports lighting.

ECM L-1: Interior Lighting Upgrade

ECM Description:

This ECM evaluated the existing interior lighting equipment at each building and recommends the installation of new lighting equipment based on the existing lamp and/or fixture type. The recommended lighting equipment will reduce current electrical consumption while - at minimum, maintaining or exceeding current light levels.

While there were many different types of lamps, ballasts, and fixtures observed, OpTerra has grouped them into categories of similar equipment to standardize the design approach and limit the types of different products installed.

Lighting equipment that was observed as already retrofitted to LED fixtures was listed as 'No Retrofit' and will remain unchanged. Fixtures that were observed to have an emergency battery back-up within the fixture were noted, and a new emergency battery back-up unit compatible with the specified LED product is included herein.

The installation of the new interior lighting products will include the following scope of work:

- Replacing existing incandescent, compact fluorescent, and halogen lamps with new LED lamps.
- Retrofitting existing linear fluorescent T8 and T12 fixtures with new LED Tubes and LED Drivers.
- Installing new LED fixtures in place of existing fixtures that cannot be retrofitted or that have degraded beyond their useful life.
- Installation of ceiling and wall mounted occupancy sensors in spaces where they offer significant savings.
- Cleaning of existing fixture lenses.
- Recycling removed lamps and ballasts.
- Disposing of removed fixtures.

Energy Savings:

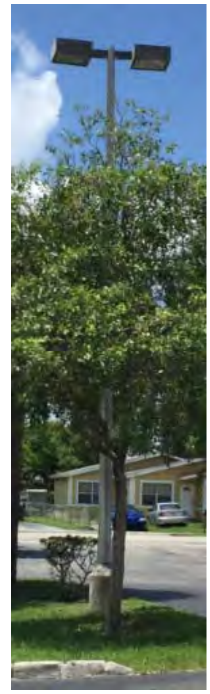
The new lighting equipment consumes less power compared to the existing lighting equipment and will therefore reduce the amount of energy consumed by each building. The new sensors will reduce the annual run hours for the fixtures they control, which will further increase the energy savings.

O&M Impact/Benefits:

The existing interior lighting equipment has a shorter average rated life than the recommended LED products, which requires them to be replaced more often. The existing lighting equipment also has strict recycling requirements that further increases maintenance costs. The new LED lighting equipment has a much longer rated life, and they come with a minimum 5-year manufacturer warranty that eliminates the material cost in the chance there is an early failure. Furthermore, another advantage to the this minimum 5-year life expectancy is that there are fewer fall incidents with regard to changing light bulbs.

ECM L-2: Exterior and Site Lighting Upgrade

ECM Description:



This ECM evaluated the existing exterior lighting equipment at each building and recommends the installation of new lighting equipment based on the lamp and/or fixture type. The recommended lighting equipment will reduce the electricity consumption while at least maintaining or exceeding the current light levels.

Exterior lighting that was observed to have already been upgraded to LED was noted and listed as 'No Retrofit'.

As part of this ECM, OpTerra will perform the following scope of work:

- Replacing existing CFL, incandescent, or halogen lamps within exterior fixtures with new LED replacement lamps.
- Retrofitting existing HID exterior fixtures with LED 'corn cob' style lamps to replace metal halide and high-pressure sodium lamps. These fixtures will be re-wired to bypass the existing ballast and the ballast will be removed.
- New LED fixture replacements for exterior fixtures that are sufficiently deteriorated beyond useful life or for applications where it is more cost effective to replace the entire fixture instead of retrofitting.
- Cleaning of existing fixture lenses.
- Recycling removed lamps and ballasts.
- Disposing of removed fixtures.

Energy Savings:

The new lighting equipment consumes less power compared to the existing lighting equipment and will therefore reduce the amount of energy consumed by the exterior lighting.

O&M Impact/Benefits:

The existing exterior lighting equipment has a shorter average rated life than the recommended LED products, which requires them to be replaced more often – which not only results in fewer costs associated with new bulb replacement, but also results in less falls, etc., that often occur with changing bulbs at tall heights. The existing lighting equipment also has strict recycling requirements that further increase maintenance costs. The new LED lighting equipment has a much longer rated life, and they come with a minimum 5-year manufacturer warranty that eliminates the material cost in the chance there is an early failure.

WATER SAVING UPGRADES

OpTerra performed an audit of all existing water consuming equipment for each of the Group B buildings/sites. The following recommendations will reduce water consumption and related chemical and energy costs through either the replacement or retrofit of the existing plumbing fixtures, domestic water sourcing, mechanical equipment, water treatment technologies, irrigation, water heating systems, and chemical cleaning infrastructure.

ECM W1: Plumbing Fixture Upgrades

This ECM considers upgrading restroom plumbing fixtures to incorporate more efficient water closets (toilets and urinals), faucets and aerators, and showerheads.

Water Closets:

ECM Description:

- Tank style water closets utilize a tank fill valve on top of the bowl which uses gravity to drain large volumes of water into the bowl during evacuation. Pressure assisted tank valves use domestic water pressure to pressurize the tank water allowing for more forceful evacuations with less water volume.
- Flush Valve Water Closets were the most common found in the sites that were audited. Flush valves are designed to release precise volumes of water when activated. High efficiency flush valve and china combinations can enable a facility to greatly reduce its water consumption by reducing flush valve flow rates and the amount of water required for evacuation.
- Wall Mount Urinals: High efficiency flush valve and china combinations for urinals can enable a facility to greatly reduce its water consumption by reducing flush valve flow rates and the amount of water required for evacuation.
- Stall Floor Mount Urinals: Floor mounted urinals utilize high flow flush valves. These valves can be retrofitted to reduce water consumption.





Energy Savings

Retrofitting water closets will lead to a substantial decrease in water consumption.

O&M Impacts/Benefits

There will be less maintenance required due to the fact there will be less mineral build up and less wear on flush valve equipment.

Equipment Replacements:

This ECM will install new plumbing fixture upgrades to reduce water consumption of water closets. The work will consist of replacing the fixtures, replacing or retrofitting the flush valves. Following tables show retrofit types and equipment (or equal) for each site that was selected for this ECM. The tables use following abbreviations:

Abbreviations used on water closet tables:

FM	FLOOR MOUNTED FLUSH VALVE WATER CLOSET,	UV	URINAL FLUSH VALVE
TT	TANK TYPE WATER CLOSET,	SS	SIDE SENSOR,
WM	WALL MOUNTED FLUSH VALVE WATER CLOSET,	TS	TOP SPUD
ADA	ADA COMPLIANT,	RS	REAR SPUD
VOR	VALVE ONLY RETROFIT	WSOFT	WATER SOFTENER

Proposed Equipment (or equal)

WATER CLOSETS	Manufacturer	Model
WALL MOUNT		
1.28 GPF Wall Mount Fixture Top Spud	Sloan	Model ST-2459
FLOOR MOUNT		
1.28 GPF Floor Mounted Fixture	Sloan	ST-2009
1.28 GPF ADA Compliant Floor Mounted Fixture	Sloan	ST-2029
TANK STYLE, PRESSURE ASSIST		
1.0 GPF ADA Compliant Tank Fill Valve Fixture	Kohler	K-4304
1.0 GPF PRESSURE ASSISTED TANK FILL VALVE	Kohler	K-4484
EB BOWL OF PLAS CLST SEAT WHIT		
WATERCLOSET FLUSHVALVES		
1.28 GAL EXP CLST FLUSH VALVE	Sloan	GEM-2® Flushometers
OVER HANDLE RETROFIT AUTOFLUSH CLST & URL	Sloan	EBV 500A
URINALS		
0.125 GPF WALL MOUNTED URINAL	Sloan	SU-1209
URINAL FLUSHVALVES		
.5 GAL CONC URN FLUSH VLV	Sloan	GEM-2® Flushometers
.125 GAL URN FLUSH VLV	Sloan	GEM-2® Flushometers

Broward Parks

Site	Location	Type	QTY	Pre-Retrofit	Post Retrofit
CD REGIONAL					
BP1	Maintenance	Men	1	FM, ADA,RS,2 BOLT CHINA,1.6 GPF,WSOFT	1.28 GPF, VOR
BP1	Maintenance	Women	2	FM, ADA,RS,2 BOLT CHINA,1.6 GPF,WSOFT	1.28 GPF, VOR
BP1	Pool	Women	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Pool	Women	10	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Pool	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Pool	Men	3	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Pool	Men	4	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	Shelter 1	Women	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 1	Women	4	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 1	Men	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 1	Men	2	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 1	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	Shelter 4	Women	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 4	Women	2	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 4	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 4	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	RR 1	Women	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	RR 1	Women	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	RR 1	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	RR 1	Men	1	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	RR 3	Women	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	RR 3	Women	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	RR 3	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	RR 3	Men	1	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	Shelter 8	Women	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 8	Women	4	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 8	Men	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Shelter 8	Men	2	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR

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CD REGIONAL (Cont.)					
BP1	Shelter 8	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	Stadium W	Men	4	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	Stadium W	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium W	Men	3	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium W	Women	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium W	Women	6	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium W	Unisex	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium W	Women	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium W	Women	6	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	West Lockers	Unisex	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,SS,	1.28 GPF, VOR
BP1	West Lockers	Unisex	1	FM, TS,2 BOLT CHINA,1.6 GPF,SS,	1.28 GPF, VOR
BP1	West Lockers	Unisex	1	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	West Lockers	Unisex	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	West Staff	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	West Staff	Women	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium East	Men	4	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	Stadium East	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium East	Men	3	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium East	Women	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium East	Women	6	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium East	Unisex	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium East	Women	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stadium East	Women	6	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	East Lockers	Unisex	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,SS,	1.28 GPF, VOR
BP1	East Lockers	Unisex	1	FM, TS,2 BOLT CHINA,1.6 GPF,SS,	1.28 GPF, VOR
BP1	East Lockers	Unisex	1	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP1	East Lockers	Unisex	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	East Staff	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	East Staff	Women	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP1	Stad. Lobby	Men	2	UV,TS,1.0 GPF,SS,	UV,TS,0.125 GPF,SS,
BP1	Stad. Lobby	Men	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,SS,	1.28 GPF, VOR
BP1	Stad. Lobby	Men	2	FM, TS,2 BOLT CHINA,1.6 GPF,SS,	1.28 GPF, VOR
BP1	Stad. Lobby	Women	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,SS,	1.28 GPF, VOR
BP1	Stad. Lobby	Women	5	FM, TS,2 BOLT CHINA,1.6 GPF,SS,	1.28 GPF, VOR

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EASTERLIN					
BP3	M	0	1	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BP3	M	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP3	M	0	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP3	W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP3	W	0	2	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP3	M	0	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BP3	M	0	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP3	M	0	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP3	W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP3	W	0	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP3	STAFF	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
Site	**Location**	**Type**	**QTY**	**Pre-Retrofit**	**Post Retrofit**
HOLLYWOOD NORTH BEACH					
BP11	M	0	2	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
TREE TOPS					
BP4	SOUTH	0	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP4	SOUTH	0	2	BOLT CHINA,1.6 GPF,EXTRA LONG VACCUM	1.28 GPF, VOR
BP4	SOUTH	0	2	STALL STYLE URINAL,1.5 GPF,	STALL STYLE URINAL,0.5 GPF,
BP4	NORTH	0	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP4	NORTH	0	2	BOLT CHINA,1.6 GPF,EXTRA LONG VACCUM	1.28 GPF, VOR
BP4	NORTH	0	2	STALL STYLE URINAL,1.5 GPF,	STALL STYLE URINAL,0.5 GPF,
BP4	GATE	0	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP4	MARINA	0	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
LONG KEY					
BP5	M	0	3	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BP5	M	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP5	M	0	2	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP5	STAFF	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP5	W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP5	W	0	5	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP5	DRESSING1	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP5	DRESSING2	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP5	M	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BP5	W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR

Libraries

Site	Location	Type	QTY	Pre-Retrofit	Post Retrofit
LIBRARY, HL, Hallandale					
BL23	M	0	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
LIBRARY, CR, Carver Ranches					
BL26	W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BL26	W	0	2	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BL26	M	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BL26	M	0	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BL26	M	0	1	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BL26	STAFFM	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BL26	STAFF W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
LIBRARY, MG, Margate					
BL22	M	0	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
LIBRARY, CP, Century Plaza					
BL24	M	0	1	TT,ADA,3.5 GPF,	PRESS. ASSISTED TT,ADA,1.00 GPF
BL24	M	0	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BL24	W	0	1	TT,ADA,3.5 GPF,	PRESS. ASSISTED TT,ADA,1.00 GPF
BL24	STAFF	0	1	TT,ADA,3.5 GPF,	PRESS. ASSISTED TT,ADA,1.00 GPF
BL24	STAFF	0	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BL24	STAFF	0	1	TT,ADA,3.5 GPF,	PRESS. ASSISTED TT,ADA,1.00 GPF
LIBRARY, NL, North Lauderdale					
BL20	BL20	0	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BL20	BL20	0	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
LIBRARY, NW, Pompano Branch					
BL27	M	0	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,

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Office and Court house

Site	Location	Type	QTY	Pre-Retrofit	Post Retrofit
North Regional Courthouse					
BO29	Jury Rooms	Men	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Jury Rooms	Women	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Jury Rooms	Men	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Jury Rooms	Women	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Jury Rooms	Men	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Jury Rooms	Women	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Jury Rooms	Men	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Jury Rooms	Women	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Judges Off.	Unisex	4	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Public West	Men	1	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO29	Public West	Men	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Public West	Women	3	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Public East	Men	1	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO29	Public East	Men	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Public East	Women	3	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Public Main	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO29	Public Main	Men	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Public Main	Women	4	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Probation	Unisex	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Room 170	Unisex	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	State Atty	Unisex	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO29	Holding Cells	Inmate	2	STAINLESS COMBINATION WATER CLOSET,	PISTON VALVE, LOCK OUT CONTROL,
Site	**Location**	**Type**	**QTY**	**Pre-Retrofit**	**Post Retrofit**
Government Center West					
BO30	1st Floor	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO30	1st Floor	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO30	2nd Floor	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO30	2nd Floor	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO30	3rd Floor	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO30	3rd Floor	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO30	4th Floor	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,
BO30	4th Floor	Men	2	UV,TS,1.0 GPF,	UV,TS,0.125 GPF,

Site	Location	Type	QTY	Pre-Retrofit	Post Retrofit
Public Safety Complex					
BO28	Gnd Floor	Men	6	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	Gnd Floor	Men	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	Gnd Floor	Women	8	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	Gnd Floor	Men	4	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	Gnd Floor	Men	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	Gnd Floor	Women	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	Gnd Floor	Men	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	Gnd Floor	Men	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	Gnd Floor	Women	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	Gnd Floor	Men	4	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	Gnd Floor	Men	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	Gnd Floor	Women	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	2nd Floor	Men	6	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	2nd Floor	Men	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	2nd Floor	Women	8	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	2nd Floor	Men	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	2nd Floor	Women	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	2nd Floor	Women	6	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	2nd Floor	Men	4	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	2nd Floor	Men	5	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	3rd Floor	Men	6	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	3rd Floor	Men	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	3rd Floor	Women	8	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	3rd Floor	Men	2	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	3rd Floor	Men	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	3rd Floor	Women	3	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	4th Floor	Men	6	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	4th Floor	Men	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	4th Floor	Women	8	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	4th Floor	Men	2	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	4th Floor	Men	3	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	4th Floor	Women	3	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	5th Floor	Men	6	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	5th Floor	Men	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	5th Floor	Women	8	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	5th Floor	Men	2	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO28	5th Floor	Men	3	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BO28	5th Floor	Women	3	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,

Site	Location	Type	QTY	Pre-Retrofit	Post Retrofit
PARK Administration Complex					
BO32	M	0	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO32	M	0	2	FM, TS,2 BOLT CHINA,3.5 GPF,	FM, TS,2 BOLT CHINA,1.28 GPF,
BO32	W	0	3	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BO32	M	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BO32	M	0	1	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BO32	M	0	1	STALL STYLE URINAL,1.5 GPF,	STALL STYLE URINAL,0.5 GPF,
BO32	W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BO32	W	0	2	FM, TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BO32	W	0	2	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BO32	M	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
TRAF ENGN Administration North					
BO31	M	0	2	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BO31	M	0	2	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,

Health and Lab

Site	Location	Type	QTY	Pre-Retrofit	Post Retrofit
PARK Administration Complex					
BO32	M	0	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
Booher building					
BH35	Main Bldg.	Men	6	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BH35	Main Bldg.	Men	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BH35	Main Bldg.	Women	8	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BH35	Main Bldg.	Men	4	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BH35	Main Bldg.	Men	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BH35	Main Bldg.	Women	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BH35	Main Bldg.	Men	1	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BH35	Main Bldg.	Men	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BH35	Main Bldg.	Women	1	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BH35	Main Bldg.	Men	4	UV,TS,1.5 GPF,	UV,TS,0.125 GPF,
BH35	Main Bldg.	Men	2	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
BH35	Main Bldg.	Women	5	WM ,TS,4 BOLT CHINA,3.5 GPF,	WM ,TS,4 BOLT CHINA,1.28 GPF,
EPD Environmental Monitoring Facility & Lab					
BH39	W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BH39	RR	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BH39	M	0	1	TT,ADA,1.6 GPF,	PRESS. ASSISTED TT,ADA,1.00 GPF,

Parking, Warehouse and Repair

Site	Location	Type	QTY	Pre-Retrofit	Post Retrofit
HIGH & BRDG Mosquito Control					
BR44	OFFICE M	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BR44	OFFICE W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BR44	FLEET M	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR
BR44	FLEET W	0	1	FM, ADA,TS,2 BOLT CHINA,1.6 GPF,	1.28 GPF, VOR

Aerators & Faucets

ECM Description:

Most faucets utilize aerators to restrict the volume of water at the mouth of a faucet, (while simultaneously generating a more comfortable flow). However, the use of high efficiency aerators can even further reduce the flow rates from faucets, while still creating a comfortable flow for handwashing and cleaning. Restricting faucet flow rates with high efficient aerators and faucets, enables a facility to conserve water and reduce energy usage associated with heating water.

Energy Savings

There will be far less water consumed due to the reduced rate of overall water flows at each fixture. Additionally, when using hot water, there will be less energy consumed by the hot water heater due to this restricted flow of hot water.

O&M Impacts/Benefits

Less mineral buildup and wear and tear of fixtures and hot water heater, which then leads to less replacement costs. Aerators to be installed are also vandal proof, therefore eliminating the need to replace stolen and/or vandalized parts/pieces.

Equipment Replacements:

This ECM will install new aerators and flow head upgrades to reduce water consumption. The proposed changes are mainly replacing the aerators with low flow aerators. Following tables show retrofit types and equipment (or equal) for each site that was selected for this ECM. The tables use following abbreviation:

SHBC = SINGLE HANDLE BASE AND COCK,

Proposed Equipment (or equal)

FAUCETS		Manufacturer	Model
	0.5 GPM Single Handle Basin Cock	Moen	8894 (Chrome)
Aerators			
	0.5 GPM, needle spray, Female	Niagara	N3205NFTP-PC-T
	1.5 GPM, bubble spray, Female	Niagara	N3215BFTP-PC-T

Broward Parks

ID	Location	Type	Qty	Pre-Retrofit	Post Retrofit
CD REGIONAL					
BP1	Pool	Men	5	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP1	Stadium West	Men	4	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	Stadium West	Unisex	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	West Lockers	Unisex	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP1	West Lockers	Unisex	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP1	West Staff	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	West Staff	Women	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	Stadium East	Men	4	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	Stadium East	Unisex	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	East Lockers	Unisex	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP1	East Lockers	Unisex	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP1	East Staff	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	East Staff	Women	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	Stadium Lobby	Men	4	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BP1	Stadium Lobby	Women	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
EASTERLIN					
BP3	M	0	2	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP3	W	0	2	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP3	STAFF	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
HOLLYWOOD NORTH BEACH					
BP11	M	0	4	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP11	W	0	4	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP11	STAFF W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP11	STAFF M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
TREE TOPS					
BP4	GATE	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP4	MARINA	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
LONG KEY					
BP5	M	0	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP5	STAFF	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP5	W	0	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP5	DRESSING1	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP5	DRESSING2	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP5	KITCHEN	0	1	Kitchen Faucet Aerator, 2.5 GPM	Kitchen Faucet Aerator, 1.5 GPM
BP5	KITCHEN	0	1	Kitchen Faucet Aerator, 2.5 GPM	Kitchen Faucet Aerator, 1.5 GPM
BP5	M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BP5	W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,

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Libraries

ID	Location	Type	Qty	Pre-Retrofit	Post Retrofit
LIBRARY, HL, Hallandale					
BL23	M	0	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL23	W	0	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL23	STAFF M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL23	STAFF W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
LIBRARY, CR, Carver Ranches					
BL26	W	0	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL26	M	0	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL26	STAFF M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL26	STAFF W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
LIBRARY, MG, Margate					
BL22	W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL22	M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL22	STAFF	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
LIBRARY, CP, Century Plaza					
BL24	M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL24	W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL24	STAFF	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL24	STAFF	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
LIBRARY, NL, North Lauderdale					
BL20	BL20	0	2	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL20	BL20	0	2	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
LIBRARY, NW, Pompano Branch					
BL27	M	0	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL27	W	0	3	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL27	STAFF	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BL27	STAFF	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,

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Office and Court house

ID	Location	Type	Qty	Pre-Retrofit	Post Retrofit
North Regional Courthouse					
BO29	Jury Rooms	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Jury Rooms	Women	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Jury Rooms	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Jury Rooms	Women	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Jury Rooms	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Jury Rooms	Women	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Jury Rooms	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Jury Rooms	Women	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Judges Offices	Unisex	4	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Public West	Men	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Public West	Women	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Jury Room	Kit	8	Kitchen Faucet Aerator, 2.5 GPM	Kitchen Faucet Aerator, 1.5 GPM
BO29	Public East	Men	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Public East	Women	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Public Main	Men	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Public Main	Women	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Probation	Unisex	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	Room 170	Unisex	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO29	State Attorney	Unisex	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
Government Center West					
BO30	1st Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	1st Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	1st Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	1st Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	2nd Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	2nd Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	2nd Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	2nd Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	3rd Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	3rd Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	3rd Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	3rd Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	4th Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	4th Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	4th Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	4th Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	Staff	Unisex	2	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO30	Staff	Unisex	5	Kitchen Faucet Aerator, 2.5 GPM	Kitchen Faucet Aerator, 1.5 GPM

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

ID	Location	Type	Qty	Pre-Retrofit	Post Retrofit
Public Safety Complex					
BO28	Ground Floor	Men	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Women	8	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Men	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Women	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Women	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Men	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Women	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Ground Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Second Floor	Men	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Second Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Second Floor	Women	8	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Second Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Second Floor	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Second Floor	Women	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Second Floor	Women	8	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Second Floor	Men	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Third Floor	Men	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Third Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Third Floor	Women	8	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Third Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Third Floor	Men	3	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Third Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Third Floor	Women	4	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Third Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Fourth Floor	Men	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Fourth Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Fourth Floor	Women	8	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Fourth Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Fourth Floor	Men	4	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Fourth Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Fourth Floor	Women	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Fourth Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Fifth Floor	Men	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Fifth Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Fifth Floor	Women	8	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Fifth Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Fifth Floor	Men	4	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BO28	Fifth Floor	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO28	Fifth Floor	Women	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,

BO28	Fifth Floor	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
PARK Administration Complex					
BO32	M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO32	W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BO32	M	0	2	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,

Health and Lab

ID	Location	Type	Qty	Pre-Retrofit	Post Retrofit
Booher building					
BH35	Main Building	Men	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Women	8	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Men	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Women	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Men	1	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Women	2	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Men	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Men	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Women	5	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Women	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BH35	Main Building	Men	6	SHBC FAUCET AERATOR,2.2 GPM,	SHBC FAUCET AERATOR,0.5 GPM,
EAP Our House					
BH40	ADMIN	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,

Parking, Warehouse and Repair

ID	Location	Type	Qty	Pre-Retrofit	Post Retrofit
HIGH & BRDG Mosquito Control					
BR44	OFFICE M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BR44	OFFICE W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BR44	FLEET M	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,
BR44	FLEET W	0	1	FAUCET AERATOR,2.2 GPM,	FAUCET AERATOR,0.5 GPM,

Showerheads

ECM Description

High efficiency pressure compensating showerheads can greatly reduce shower flow rates while still creating a comfortable flow of water. Restricting shower flow rates enables a facility to conserve water and reduce energy usage associated with heating water, thereby decreasing the water heater's usage.

Energy Savings

Less water consumed and less hot water generated by the hot water heater.

O&M Impacts/Benefits

Increased lifecycle of hot water heater due to less water being produced, and increased showerhead lifecycle due to mineral buildup decaying the head itself.

Equipment Replacements:

This ECM will install new shower heads to reduce water consumption. The work consists of replacing existing shower heads with new low flow showers heads. Following tables show retrofit types and equipment (or equal) for each site that was selected for this ECM.

Proposed Equipment (or equal):

SHOWERS		Manufacturer	Model
	1.5 GPM Handheld Chrome Showerhead	Niagara	N2945CH
	1.5 GPM Chrome Vandal Proof	Niagara	N2150

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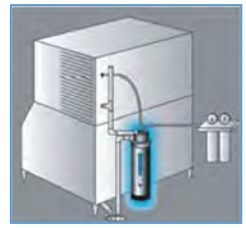
ID	Site	Location	Type	Qty	Pre-Retrofit	Post Retrofit
BP1	CD REGIONAL	West Lockers	Unisex	3	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,
BP1	CD REGIONAL	West Lockers	Unisex	1	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,
BP1	CD REGIONAL	East Lockers	Unisex	3	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,
BP1	CD REGIONAL	East Lockers	Unisex	1	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,
BP3	EASTERLIN	STAFF	0	1	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,
BO28	Public Safety Complex	Second Floor Lockers	Women	9	COMMERICAL SHOWER HEAD2.5 GPM,	LOW FLOW COMMERICAL SHOWERHEAD,1.5 GPM,
BO28	Public Safety Complex	Second Floor Lockers	Women	1	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,
BO28	Public Safety Complex	Second Floor Lockers	Men	12	COMMERICAL SHOWER HEAD2.5 GPM,	LOW FLOW COMMERICAL SHOWERHEAD,1.5 GPM,
BO28	Public Safety Complex	Second Floor Lockers	Men	1	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,
BH39	EPD Environmental Monitoring Facility & Lab	M	Men	1	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,
BH39	EPD Environmental Monitoring Facility & Lab	W	Women	1	HAND HELD DOMESTIC SHOWER HEAD,2.5 GPM,	LOW FLOW HAND HELD DOMESTIC SHOWER HEAD,1.5 GPM,

ECM W2: Install Refrigeration Line Heat Exchanger on Ice Machines

ECM Description



With a refrigeration heat exchanger system installed, cold discharge water from an ice machine or refrigeration unit is exposed to incoming domestic water in a reservoir. This heat exchange can cool incoming water by more than 16%. Due to this drop-in temperature, the efficiency of the ice machine improves by more than 18%.

Energy Savings

This creates energy savings by reducing the cooling load and cycle time of the ice machine or refrigeration unit.

O&M Impacts/Benefits

Ice machine does not have to work as hard to produce ice, thereby increasing the ice machine's lifecycle.

Equipment Replacements:

This ECM will install new Refrigeration Line Heat Exchanger on Ice Machines. The proposed heat exchanger is Chilltech Model: Chilltech II. Equipment (or equal). Following site and equipment or equal was selected for this ECM.

ID	Site	Location	Type	Qty	Pre-Retrofit	Post Retrofit
BP1	CD REGIONAL	Maintenance	Kit	1	ICE MACHINE,AIR COOLED,	CHILLED WATER HEAT EXCHANGER RETROFIT,AIR COOLED,
BP1	CD REGIONAL	Stadium Lobby	Kit	1	ICE MACHINE,AIR COOLED,	CHILLED WATER HEAT EXCHANGER RETROFIT,AIR COOLED,

ECM W3: Central Control Weather Based Irrigation System

ECM Description

Most automated irrigation systems develop watering schedules based on manual time-based irrigation controllers. The controllers that require manual adjustments cannot be controlled remotely, and develop watering schedules based on daily or weekly time schedules. Due to these systems operate without consideration of weather conditions, they are prone to overwatering on days when there is little to no need for irrigation due to favorable weather conditions. Central controlled smart irrigation systems receive or collect data daily to calculate the ET rates (evapotranspiration rates) of the controller's microclimate. ET calculations incorporate various climate parameters (wind, sunlight, temperature, and precipitation) to determine the base water demand of the irrigation system. This enables the system to then create a water efficient daily irrigation schedule - to water as conservatively as possible; only as needed. Central controlled smart irrigation systems can be monitored and controlled remotely through various BAS building management software.

One system of this type is the WeatherTrak ET Pro3, which links daily with a climate center that compiles 8 million data points daily to calculate and deliver site-specific, local weather data accurate down to one square kilometer to each controller. This central control system enables all features of each controller to be controlled and monitored by the irrigation manager from a remote location.

Energy Savings

Reduced water consumption for irrigation.

O&M Impacts/Benefits

Less wear and tear on irrigation equipment, thereby increasing equipment life. Landscape will not die due to under watering, nor will it die due to mold growth from over watering when water is not needed.

Equipment Replacements:

This ECM will install above described "Central Control Weather Based Irrigation System". At each of the sites the existing controllers are replaced with new weather based controller. All the zones that are connected to existing controller will be controlled by new system. The proposed controller is Hydropoint Model: WeatherTRAK ET Pro3 (or equal). Following site and equipment or equal was selected for this ECM.

ID	Site	Location	Type	Qty	Pre-Retrofit	Post Retrofit
BO29	North Regional Courthouse	Landscaping	IRR	1	TIME BASED IRRIGATION CLOCK,ZONE,	CENTRAL CONTROLLED AND CLIMATE SENSITIVE IRRIGATION CLOCK,ZONE,
BO28	Public Safety Complex	Landscape	IRR	2	TIME BASED IRRIGATION CLOCK,ZONE,	CENTRAL CONTROLLED AND CLIMATE SENSITIVE IRRIGATION CLOCK,ZONE,
BP1	CD REGIONAL	Landscape	IRR	3	TIME BASED IRRIGATION CLOCK,ZONE,	CENTRAL CONTROLLED AND CLIMATE SENSITIVE IRRIGATION CLOCK,ZONE,

Building Envelope Improvements

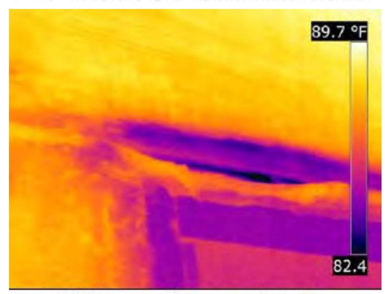
An accurate assessment of the performance of the building envelope is critical to the success of a facility's energy management program. Energy losses in the building envelope are caused by a range of issues including air leaks, thermal bridging and wet insulation. Air leaks in the envelope of a building can cause direct energy loss. Moisture in the envelope will migrate to the interior of the system, reducing insulation values and damaging building components.

ECM B1: Seal Building Cracks including Weather strip, Door Sweeps, and Astragals

ECM Description:

In the Group B Buildings surveyed, numerous air-leak paths through the envelope were found in such locations as gaps at transitions between wall, floor and roof levels; structural penetrations through the wall system and at transitions in wall-system types. The buildings on this project provide significant opportunity for reducing air infiltrations, greatly improving occupant comfort as well as providing valuable energy savings with rapid payback. Leaky buildings can be drafty and uncomfortable, inefficient, and expensive to heat and cool. Air leaks allow unconditioned air to infiltrate the conditioned interior spaces, or to allow conditioned air to exit the building, drastically increasing heating and cooling loads by adding or removing heat. It is due to such leaks that we find HVAC systems and all components of these systems having to run for longer periods of time, therefore decreasing this same equipment's service life. These same leaks also contribute to problems with moisture, noise, dust and insects.

"W1" Recommend sealant around windows



"W1" Energy loss around window

This Building Envelope Energy Conservation Measure (ECM) addresses unwanted air infiltration by locating and sealing the cracks, gaps and openings where unintended air flow occurs. The greatest breaches occur through gaps where walls meet the floors and ceilings, plumbing and electrical penetrations, and through gaps or openings around windows and doors. By utilizing various sealing and weather-stripping tools and techniques, these breaches can be repaired, bringing energy savings to fruition.

Weather stripping, door sweeps, and astragals will be used to eliminate or greatly diminish gaps at transitions between the wall, floor and roof levels; structural penetrations through the wall system and at transitions in wall-system types air-leak, etc. Such air infiltration paths will be sealed throughout the building's envelope, reducing unconditioned air from entering the space, and/or, conditioned air from existing the space.

Energy Savings

Sealing air leaks within the building will lead to energy savings due to decreased HVAC usage as less unconditioned air will enter the building, and less conditioned air will escape the space as well. A tighter building envelope leads to less energy consumption, moisture problems, dirt and debris, and insect infiltration.

O&M Impacts/Benefits

- HVAC equipment lifecycles increase as equipment will be used less frequently to meet the set-point temperature of the space.
- Cleaner facilities due to dirt and insects infiltrating the building through cracks and crevices.
- Lessening chance of mold growth and overall moisture infiltrating building, thereby increasing building infrastructure components and quality of life for inhabitants.

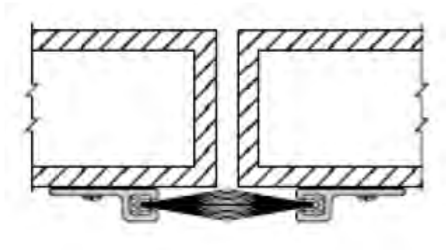
Building Envelope Improvements:

This ECM will install building envelope improvements to reduce infiltration and heat gain of buildings. The work will consist of sealing building cracks and gaps. Sealing window and door frames. Weather stripping windows and doors. Following material (or equal) will be used to improve building envelope performance.

Weather-Stripping

After the weather-stripping is installed, the doors will be tested for proper operation. The weather-stripping/sweep should be inspected annually. Door weather-stripping material is referred to as DF, which references DF Commercial/ Industrial weather-stripping. All weather-stripping materials shall have a mill finish, unless otherwise specified. Sealeze Nylon Therm-L-Brush Weatherseal 1,500,000 cycle testing ANSI 156.4, 1980

Astragals



Astragals are the weather-stripping material used to cover the gap between two doors. Sealeze Astra-Sweep Nylon Therm-L- Brush Astragal Seal 1,500,000 cycle testing ANSI 156.4, 1980

Door Sweeps

The reference to DS is for the door sweep material, which is also a Commercial/ Industrial product. All weather-stripping materials shall have a mill finish, unless otherwise specified. (Sealeze Nylon Therm-L- Brush Door Sweep 1,500,000 cycle testing ANSI 156.4, 1980

Polyurethane Sealants:

Polyurethane sealant will be installed in all wall cracks, concrete cracks, mortar cracks, control joints, and exterior applications unless otherwise specified. Compliance: Sealant shall meet or exceed requirements of these standards: 1. ASTM C920, Type S, Grade NS, Class 35, Use NT, M, A, and O.

Silicone Sealants:

Silicone sealant is used for all silicone weather-strip application, for capping the exterior edges of any EPDM glazing gaskets, and for sealing joints between non-porous surfaces such as metal and glass unless otherwise specified. Compliance: Sealant shall meet or exceed requirements of these standards: ASTM C920, Type S, Grade NS, Class 100/50, Use T, NT, G, M, A, and O.

Building Envelope Improvements Sites:

Below tables show scope of work per site for buildings selected for building envelope improvements.

CD Regional Park BP1

Quantity	Unit	Envelope Improvements
0.01	Sq/ft	Penetrations sealed with polyurethane sealant
105	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
18	Ea	Sets of weather-strip DF
18	Ea	Door sweeps
4	Ea	Astragals (weather-strip for center of double door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
3	Ea	Sets of weather-strip DF
7	Ea	Door sweeps

Topeekeegee Yugnee Park BP2

Quantity	Unit	Envelope Improvements
0.01	Sq/ft	Penetrations sealed with polyurethane sealant
144	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
10	Ea	Sets of weather-strip DF
10	Ea	Door sweeps
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
1	Ea	Sets of weather-strip DF
1	Ea	Door sweeps

Easterlin Park BL3

Quantity	Unit	Envelope Improvements
0.02	Sq/ft	Penetrations sealed with polyurethane sealant
8	Ea	Sets of weather-strip DF
8	Ea	Door sweeps
1	Ea	Astragals (weather-strip for center of double door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
2	Ea	Door sweeps

Tree Tops BP4

Quantity	Unit	Envelope Improvements
0.001	Sq/ft	Penetrations sealed with polyurethane sealant
554	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
11	Ea	Sets of weather-strip DF
11	Ea	Door sweeps
3	Ea	Astragals (weather-strip for center of double door)

Long Key BP5

Quantity	Unit	Envelope Improvements
0.1	Sq/ft	Penetrations sealed with polyurethane sealant
16	Ea	Sets of weather-strip DF
16	Ea	Door sweeps
6	Ea	Astragals (weather-strip for center of double door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
3	Ea	Sets of weather-strip DF
3	Ea	Door sweeps

Brian Piccolo BP7

Quantity	Unit	Envelope Improvements
18	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
7	Ea	Sets of weather-strip DF
7	Ea	Door sweeps
1	Ea	Astragals (weather-strip for center of double door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
1	Ea	Sets of weather-strip DF
1	Ea	Door sweeps

Fern Forest Nature Preserve BP8

Quantity	Unit	Envelope Improvements
0.04	Sq/ft	Penetrations sealed with polyurethane sealant
264	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
14	Ea	Sets of weather-strip DF
14	Ea	Door sweeps
4	Ea	Astragals (weather-strip for center of double door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
4	Ea	Sets of weather-strip DF
4	Ea	Door sweeps

Plantation Heritage BP9

Quantity	Unit	Envelope Improvements
0.01	Sq/ft	Penetrations sealed with polyurethane sealant
183	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
8	Ea	Sets of weather-strip DF
8	Ea	Door sweeps
1	Ea	Astragals (weather-strip for center of double door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
1	Ea	Sets of weather-strip DF
1	Ea	Door sweeps

Secret Woods BP10

Quantity	Unit	Envelope Improvements
0.03	Sq/ft	Penetrations sealed with polyurethane sealant
399	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
17	Ea	Sets of weather-strip DF
17	Ea	Door sweeps
3	Ea	Astragals (weather-strip for center of double door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
1	Ea	Sets of weather-strip DF
1	Ea	Door sweeps

Hollywood North Beach BP11

Quantity	Unit	Envelope Improvements
0.01	Sq/ft	Penetrations sealed with polyurethane sealant
16	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
2	Ea	Sets of weather-strip DF
2	Ea	Door sweeps

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African American Library BL13

Quantity	Unit	Envelope Improvements
322	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
17	Ea	Sets of weather-strip DF
17	Ea	Door sweeps
4	Ea	Astragals (weather-strip for center of double door)
1	Ea	Sets of weather-strip DF (OH Door)
1	Ea	Door sweeps (OH Door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
6	Ea	Sets of weather-strip DF
6	Ea	Door sweeps
1	Ea	Astragals (weather-strip for center of double door)

Government Center West

Quantity	Unit	Envelope Improvements
6	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
23	Ea	Sets of weather-strip DF
23	Ea	Door sweeps
5	Ea	Astragals (weather-strip for center of double door)
1	Ea	Sets of weather-strip DF (OH Door)
1	Ea	Door sweeps (OH Door)
Quantity	**Unit**	**Weatherization/Preventative Maintenance**
4	Ea	Sets of weather-strip DF
4	Ea	Door sweeps
2	Ea	Astragals (weather-strip for center of double door)

Integrated Waste South Landfill BO33

Quantity	Unit	Envelope Improvements
18	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
12	Ea	Sets of weather-strip DF
12	Ea	Door sweeps
4	Ea	Astragals (weather-strip for center of double door)
7	Ea	Sets of weather-strip DF (OH Door)
7	Ea	Door sweeps (OH Door)

EAP Our House BH40

Quantity	Unit	Envelope Improvements
0.05	Sq/ft	Penetrations sealed with polyurethane sealant
2	Ea	Sets of weather-strip DF
2	Ea	Door sweeps

BSO Maintenance Facility BR42

Quantity	Unit	Envelope Improvements
76	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
9	Ea	Sets of weather-strip DF
9	Ea	Door sweeps

BCJC South Parking BR43

Quantity	Unit	Envelope Improvements
12	LF	Wall cracks, window/door frames and vents sealed with polyurethane sealant
10	Ea	Sets of weather-strip DF
10	Ea	Door sweeps

South Maintenance Shop BR45

Quantity	Unit	Envelope Improvements
0.01	Sq/ft	Penetrations sealed with polyurethane sealant
4	Ea	Sets of weather-strip DF
4	Ea	Door sweeps
1	Ea	Astragals (weather-strip for center of double door)

SOLAR ENERGY (PHOTOVOLTAIC) SYSTEMS

OpTerra performed an audit of all Group B building rooftops, building electrical service and annual utility charges. Most rooftops examined were found to be modified bitumen (built up) roofs with tar and gravel surfaces. Certain facilities do have more than one type of roof, most notably metal standing seam.

The existing structures were evaluated and noted as to age and condition. Once the sites and their utility costs were evaluated, the OpTerra team then proceeded with developing solar energy systems in suitable locations at the facilities receiving maximum Sun exposure. The ultimate goal is reducing the County's to purchase power from the utility, Florida Power and Light (FPL).

During the audit, it was noted that some of the facilities have various types of roof mounted equipment that must be avoided as well as some varying roof heights and nearby structures that will shade certain areas. Only the areas where full Sun exposure is received from 9am-3pm daily were evaluated for solar panel installation.

Benefits of Photovoltaic implementation are:

- Reduction in electric purchase from the FPL
- Energy independence and redundancy in the event of a power outage
- Sustainable energy installation improves occupant experience
- Environmental stewardship
- Enhanced public relations
- Tax payer savings

This section includes final site selections for solar installations. The solar sites selected were those with the greatest savings that met the overall project 20-year payback criteria. The 10 sites presented below are included in this project and described in the following section.

- BL15 - LIBRARY, WR, West Regional
- BL16 - LIBRARY, NO, North West Regional
- BL17 - Weston Library
- BO28 - Public Safety complex
- BO29 - North Regional Courthouse
- BO30 - Government Center West
- BO31 - Traffic Engineering Administration North
- BH37 - Family Success Center, North, Pompano
- BR41 - Mass Transit North Maintenance
- BR43 - BCJC South Parking Garage

ECM S1 and S2: Solar Power (Photovoltaic) System

ECM Description:

A photovoltaic system, also known as a PV system or solar power system, converts sunlight into electricity. PV is a power system designed to supply usable solar power harvested from the sun's energy by means of photovoltaics. This system, which sets up an energy producing electrical system, consists of an arrangement of several components such as solar panels, which absorb – then convert sunlight into electricity; solar inverters, which change the electric current from DC to AC; miscellaneous mounting and cabling hardware that tie the system together, and/or, assist in the system's collective components maintaining a stationary position where mounted. PV systems convert light directly into electricity and shouldn't be confused with other technologies, such as concentrated solar power or solar thermal, used for heating and cooling. These PV systems are mounted on rooftops (S1) and on parking lots (S2) with each varying in size and electrical output to match building electrical demand.

The buildings selected within "Group B", currently receive all electric power solely from the utility grid. The ever-rising cost of energy combined with the enhanced awareness of climate change, create an ideal situation for solar panels to be implemented at appropriate locations at each facility.

Energy Savings:

- Electricity generated by the sun, offsetting the need to purchase power from the utility grid.
- Positive environmental impact due to electricity being produced with no greenhouse gas emissions.
- Solar electricity provides a hedge against utility inflation by creating a levelized cost of energy (LEC) through ownership of a private self-generating power system that has a fixed upfront cost with minor O&M throughout the long life of a solar electric system.
- Solar panels reflect light off the roof thereby improving the heating and cooling system of the host facility - and in some cases, extends the life of the roof structure itself.

O&M Impact/Benefits:

- O&M impacts of adding solar electric to the facilities is minimal as there are very few moving parts to break down.
- Solar panels that will be installed will have a 25-year output warranty and are made to withstand outside atmospheric changes.
- They are environmentally friendly, and should go years at a time without any need for repair, or anything beyond basic routine maintenance.
- Systems will be fully monitored electronically so that any issues that may arise would be alerted to staff via email or text message.

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Pricing Comment:

The following pages describe installation details for the 10 anticipated sites. The equipment selections are shown for panels and inverters. However, the selections may change during the final design due to the market pricing volatility which is expected with proposed import tariffs on solar equipment.

Roof warranties:

The OpTerra solar project team recognizes that there may be buildings with **existing roof warranties in place.** In these instances, we anticipate contacting and coordinating with the individual roofing manufacturers and vendors to ensure that warranty specifications are kept intact. Our team will take every measure to work with the roofing manufacturer and apply all recommended methodologies and procedures to keep any existing manufacturer's warranty in effect after our scope of work has been performed.

OpTerra is well versed in the different roofing requirements of the various manufacturers. We are aware of the types of roofing materials installed on the proposed buildings and confident that we can satisfy the requirements that will be imposed by the roofing manufacturers.

Operation & Maintenance Services:

Operation & Maintenance Services proposed on this ECM include following; inspect and evaluate the PV systems annually to validate current condition and performance. Provide preventative maintenance and conduct any required minor repairs on-site. Generally, each inspection shall include the following steps for entire PV system:

Inspection Procedure:

- Visual inspection of all components. Check for obvious damage, nests, or rodent/pest damage
- Remove covers from combiner boxes and inspect connections, clean and tighten as needed
- Test array voltage outputs and amperage outputs
- Inspect support mounts for integrity and tighten if necessary
- Check all bonding lugs and bond wire for corrosion, clear if necessary
- Check all building penetrations for watertight seal, if applicable, then reseal if needed
- Test DC disconnect for positive shutoff
- Test all fuses in disconnects
- Test power input side of inverter and at output side of inverter
- Test AC breaker(s)
- Test impedance of system ground
- Check connections/lugs on any ground rods, tighten as needed

- Test fuses or breakers on inverters
- Check mounts and labeling for disconnects and inverters
- Test anti-islanding function
- Test transfer switch
- Check other components of system necessary for proper operation of system
- Complete a full report on system operation
- Does not include grounds keeping or system panel cleaning

The contractor shall perform all **minor repairs** found during a maintenance inspection as required. A minor repair is defined and considered as any such non-complex repair work requiring only a small limited amount of labor using minor truck stock material and not exceeding one (1) hour duration to complete on average.

The Customer may inspect contractor's repairs at any time without notice. Acceptance of all work completed by the Solar Contractor may be subject to an inspection as deemed necessary by the County.

In the event that the County notifies Solar Contactor of defects in the work performed, the Solar Contractor, within forty-eight (48) hours of receiving notice from the County, either perform the repair corrections or schedule an appointment with the designated Broward County Facilities Manager, to make the required repairs. Repairs on unacceptable workmanship shall be completed within five (5) days of receipt of notice of defect (unless a later access date is required by the County). Solar Contractor shall notify the designated Broward County Facilities staff member of the planned repair date, as well as the date of completion of the repair.

If a need to perform a major PV system repair is found upon completing a PV system maintenance inspection, the Solar Contractor shall submit a request to the County with a detailed report of problems found, accompanied by a cost proposal with work scope for approval prior to performing the work.

UNSCHEDULED MAINTENANCE WORK

The County may assign maintenance and repair work to the solar contractor as needed via a Work Order (or other mutually agreed method). The Work Order shall specify the PV system, including any contact information and location for desired work to be performed. Upon Contractor's acceptance of the Work Order, the Contractor shall contact the designated Broward County site owner for access as necessary, and schedule the time to perform the work.

Any major PV system repair after warranty period is Broward County's responsibility and should be reported to the Solar Contractor within 24 hours so that solar system production is not affected by down times.

The County is also responsible to maintain the panels in good working order by keeping the collector surfaces free of debris like construction dust, leaves or other foreign material that degrades collector performance. In general collector panels do not need to be washed in Florida due to the large amounts of rain we receive each month, but if for any reason the panels need to be washed/cleaned it is the County's responsibility to initiate an unscheduled maintenance Work Order.

BL15 - LIBRARY, WR, West Regional

Project Description:

The Solar PV installation is utilizing the available roof space on the roof, providing ample room for a 214.8 kW solar installation at the West Regional Library. The flexible design has 632 solar panels at 350 watts each. The flat roof with open space provides plenty of room for a solar electric system. (See panel layout plan in this section).

This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

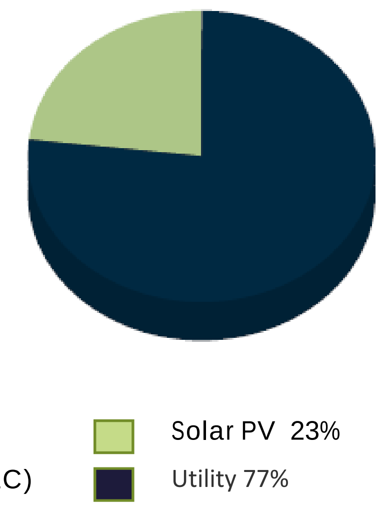
Solar PV Panels: 632 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 9 x Solectria Renewables, Model: PVI 23TL-480

Total Panel Area: 13,504 sq-ft

Solar PV Equipment Typical Lifespan

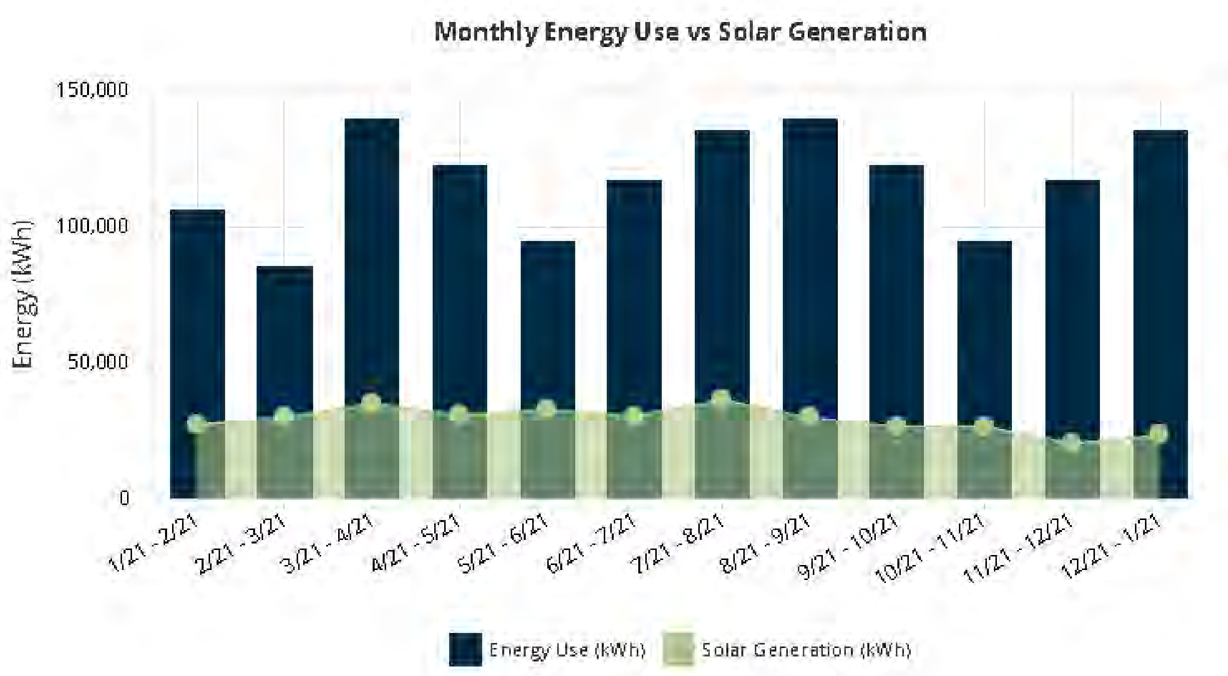
Solar Panels: Greater than 30 Years, Inverters: 15 Years



Solar PV System Rating

System Peak Power: 214.88 kW DC (210.582 kW AC, 192.621 kW CEC)

Annual Site Energy Use: 1,408,614 kWh



The WR library is easily adaptable for solar in that it has a modified built-up roof as found throughout Broward County, with minor roof obstructions to work around. The building will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.

The **modified built-up roof** will have a partially ballasted and partially anchored system in place. Solar panels will be mounted facing south at a 10-degree tilt. Solar panels are mounted on custom racking that also contains ballast trays where special concrete blocks are placed to accent the anchor attachments. The anchor attachments are efficiently designed to be as least invasive to the buildings as possible. A “u-anchor” or sometimes referred to as “o-mount” is placed directly on the roof surface and screwed through the decking rather than cut down through. From there, an exact piece of matching roof material is placed over the post and heat welded to the roof surface and sealed with the appropriate material to create a continuous surface as though they were put on at the time of initial roof installation.

The 9 x Solectria Renewables, **inverters** will be mounted in locations recommended by the Solar Contractor, but ultimately be decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses - where Internet service is available.

Upon completion of the project and all inspections passed, the FPL will be engaged to install **bi-directional meters** anywhere solar energy is tied. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The picture seen below shows a proposed solar panel layout in multiple field segments on the WR Library's roof. The design includes 632 Solar PV panels and total panel area of 13,504 sq.ft. The design incorporates maintenance access to roof equipment. The final panel layout may change due to field conditions, and/or, upon Broward County's acceptance during final design phase.

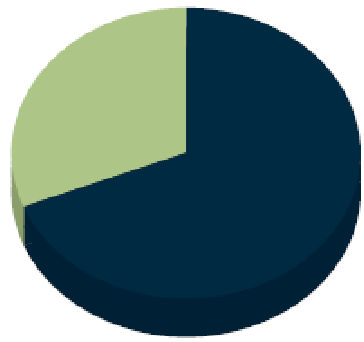
Detailed Layout

BL16 - LIBRARY, NO, North West Regional

Project Description:

The North West (NO) Regional Library Solar PV installation is utilizing the available roof space on the roof. There is ample room for a 285.2 kW solar installation at this facility. The flexible design has 839 solar panels at 350 watts each. The flat roof with open space provide plenty of room for a solar electric system, see panel layout plan in this section.

This solar installation consists of following components.



Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

Solar PV Panels: 839 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 8 x Solectria Renewables, Model: PVI 36TL-480

Total Panel Area: 17,926 sq-ft

Solar PV Equipment Typical Lifespan

Solar Panels: Greater than 30 Years, Inverters: 15 Years

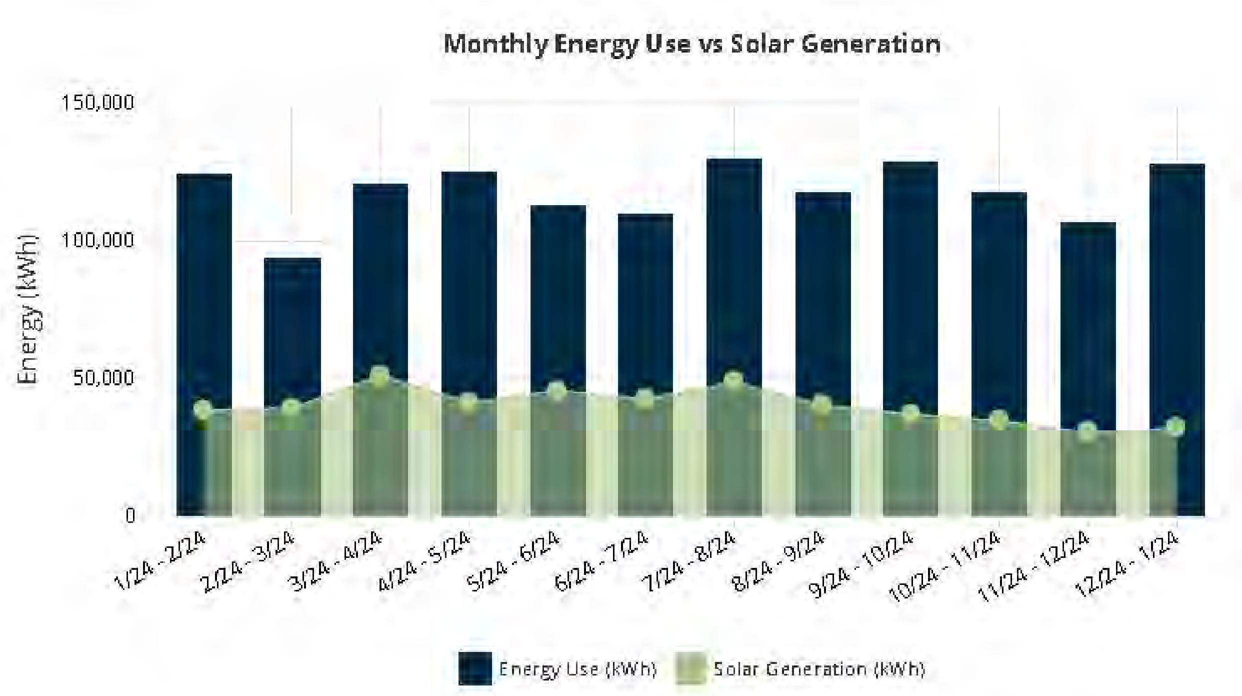
Solar PV System Rating

System Peak Power: 285.26 kW DC (279.555 kW AC, 255.71 kW CEC)

Annual Site Energy Use: 1,412,538 kWh

Solar PV 31%

Utility 69%



The NO Regional Library facility is easily adaptable for solar in that it has a modified built-up roof as found throughout Broward County, with minor roof obstructions to work around. The building will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.

The **modified built-up roof with gravel coating** will have a partially ballasted and partially anchored system in place. Solar panels will be mounted facing south at a 10-degree tilt. Solar panels are mounted on custom racking that also contains ballast trays where special concrete blocks are placed to accent the anchor attachments. The anchor attachments are efficiently designed to be as least invasive to the buildings as possible. A “u-anchor” or sometimes referred to as “o-mount” is placed directly on the roof surface and screwed through the decking rather than cut down through. From there, an exact piece of matching roof material is placed over the post and heat welded to the roof surface and sealed with the appropriate material to create a continuous surface as though they were put on at the time of initial roof installation.

The **inverters** will be mounted in locations recommended by the Solar Contractor, but will ultimately be decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses as long as Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The picture seen below showcases the proposed solar panel layout in multiple field segments on the roof. The design includes 839 Solar PV panels and total panel area of 17,926 sq. ft. The design incorporates maintenance access to roof equipment. The final panel layout may change due to field conditions during final design phase.

BL17 - Weston Library

Project Description:

The Weston Library Solar PV installation is utilizing the available roof space to implement the system. There is ample room for a 241.4 kW solar installation at this facility. The flexible design has 710 solar panels at 350 watts each. The flat roof and open roof space provide plenty of room for a solar electric system, see panel layout plan in this section. This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

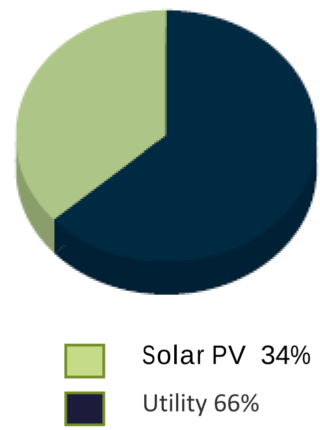
Solar PV Panels: 710 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 8 x Solectria Renewables, Model: PVI 28TL-480

Total Panel Area: 15,170 sq-ft

Solar PV Equipment Typical Lifespan

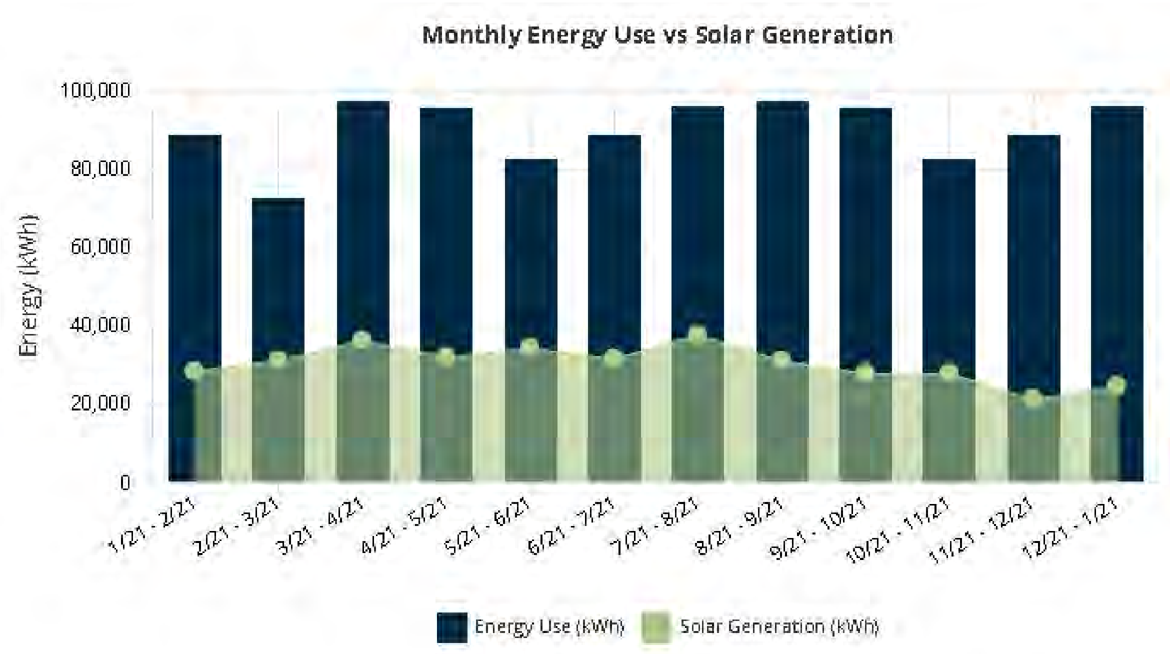
Solar Panels: Greater than 30 Years, Inverters: 15 Years



Solar PV System Rating

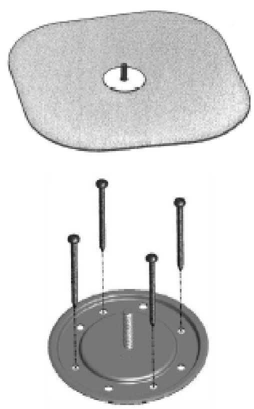
System Peak Power: 241.4 kW DC (236.572 kW AC, 216.394 kW CEC)

Annual Site Energy Use: 1,079,314 kWh


Monthly Energy Use vs Solar Generation
100,000
80,000
60,000
40,000
20,000
0
Energy (kWh)
1/21 - 2/21
2/21 - 3/21
3/21 - 4/21
4/21 - 5/21
5/21 - 6/21
6/21 - 7/21
7/21 - 8/21
8/21 - 9/21
9/21 - 10/21
10/21 - 11/21
11/21 - 12/21
12/21 - 1/21
Energy Use (kWh)
Solar Generation (kWh)

Installation:

The Weston Library is easily adaptable for solar in that it has a modified built-up roof as found throughout Broward County with minor roof obstructions to work around. The building will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.



The **modified built-up roof** with gravel coating will have a partially ballasted and partially anchored system in place. Solar panels will be mounted facing south at a 10-degree tilt. Solar panels are mounted on custom racking that also contains ballast trays where special concrete blocks are placed to accent the anchor attachments. The anchor attachments are efficiently designed to be as least invasive to the buildings as possible. A “u-anchor” or sometimes referred to as “o-mount” is placed directly on the roof surface and screwed through the decking rather than cut down through. From there, an exact piece of matching roof material is placed over the post and heat welded to the roof surface and sealed with the appropriate material to create a continuous surface as though they were put on at the time of initial roof installation.

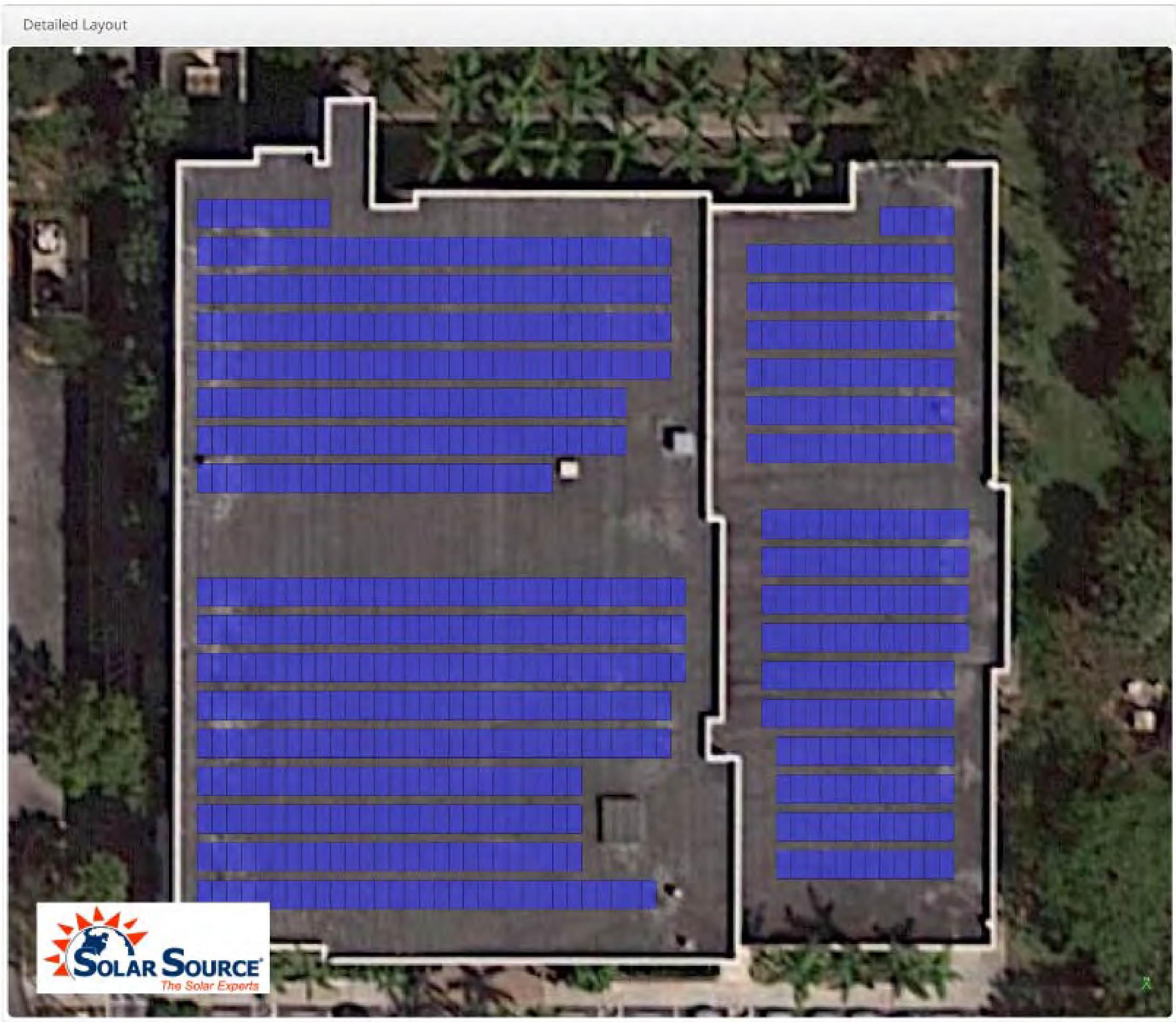
The **inverters** will be mounted in locations recommended by the contractor but ultimately decided by Broward County. Inverters are ideally placed as close to the panels connected to them as possible, to allow for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses - where Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The below picture seen below showcases the proposed solar panel layout in two field segments. The design includes 710 Solar PV panels and total panel area of 15,170 sq. ft. The design incorporates maintenance access to roof equipment. The final panel layout may change due to field conditions, and/or, per Broward County's approval during the final design phase.



BO28 - Public Safety Complex

Project Description:

The Public Safety Complex Solar PV installation is utilizing the available roof space on the roof and available parking space for shadeport installation, there is room for 1368.5 kW solar installation at this facility. The flexible design has 4025 solar panels at 350 watts each. The roofs and parking lot provides plenty of room for a solar electric system, see panel layout plan in this section.

This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

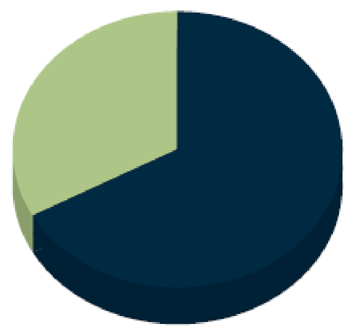
Solar PV Panels: 4025 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 27 x Solectria Renewables, Model: PVI 50TL-480

Total Panel Area: 86,000 sq-ft

Solar PV Equipment Typical Lifespan

Solar Panels: Greater than 30 Years, Inverters: 15 Years

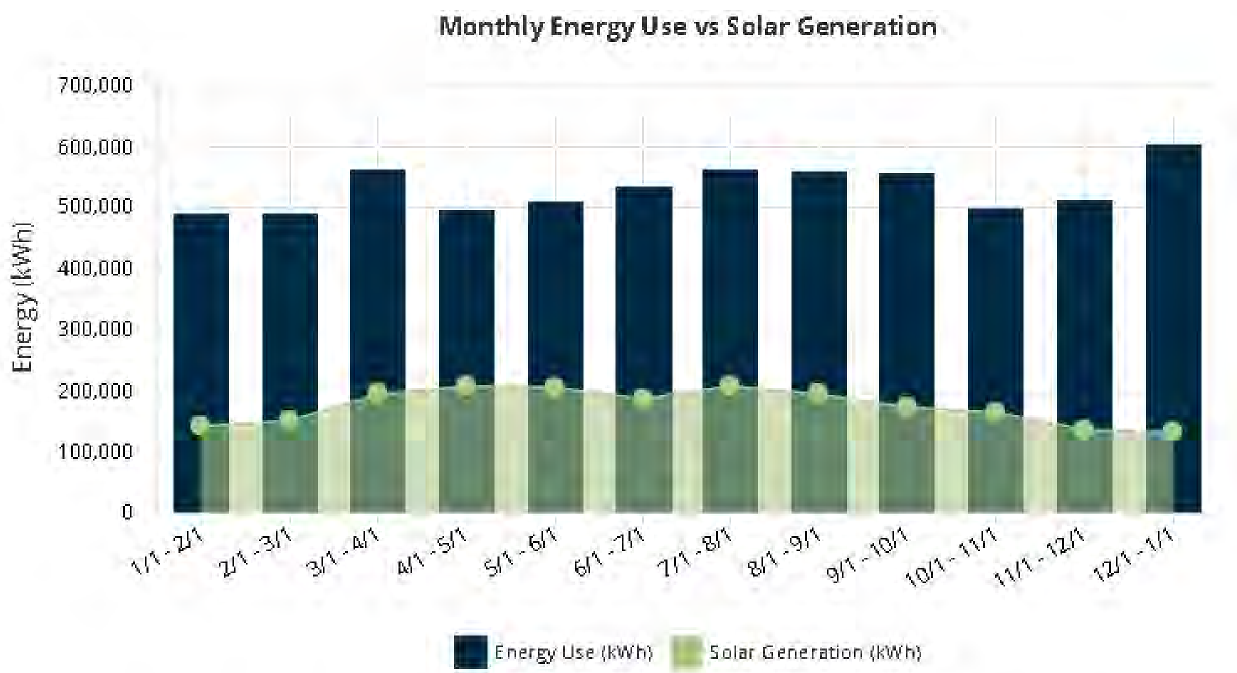


Solar PV System Rating

System Peak Power: 1368.5 kW DC (1347.973 kW AC, 1232.998 kW CEC)

Annual Site Energy Use: 6,362,640 kWh

Solar PV 32%
Utility 68%



This Public Safety Complex is easily adaptable for solar implementation in that it has available roof space and parking lot space. The canopy installation will not reduce parking spaces and it will provide shading for cars parked underneath. The rooftop and parking lot will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.

The **shadeport** installation proposed is following previously developed design and construction that has been implemented on earlier projects. The design utilizes concrete piers for anchoring, aluminum frame construction and design that meets Florida wind loading requirements.

The **inverters** will be mounted in locations recommended by the Solar Contractor, but ultimately decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses where Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The below picture shows proposed solar panel layout on multiple roofs and parking lots. The design includes 4025 Solar PV panels, with total panel area of 86,000 sq. ft. The design follows car parking patterns and allows for rooftop maintenance access to the equipment. The final panel layout may change due to field conditions, and/or, Broward County's acceptance during final design phase.


Detailed Layout
SOLAR SOURCE
The Solar Experts

BO29 - North Regional Courthouse

Project Description:

The North Regional Courthouse Solar PV installation is utilizing the available roof space on the roof. There is room for 1242.7 kW of solar installation at this facility. The flexible design has 3655 solar panels at 350 watts each. The flat roof with open space provides plenty of room for a solar electric system, see panel layout plan in this section.

This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

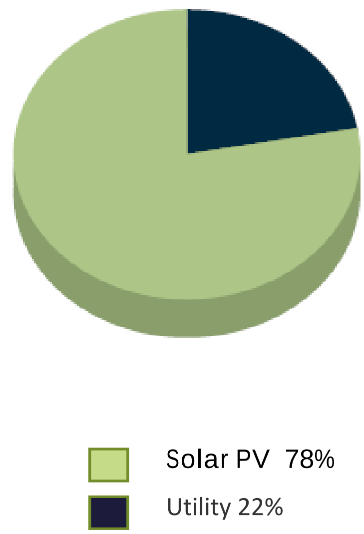
Solar PV Panels: 3655 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 44 x Solectria Renewables, Model: PVI 28TL-480

Total Panel Area: 78,094 sq-ft

Solar PV Equipment Typical Lifespan

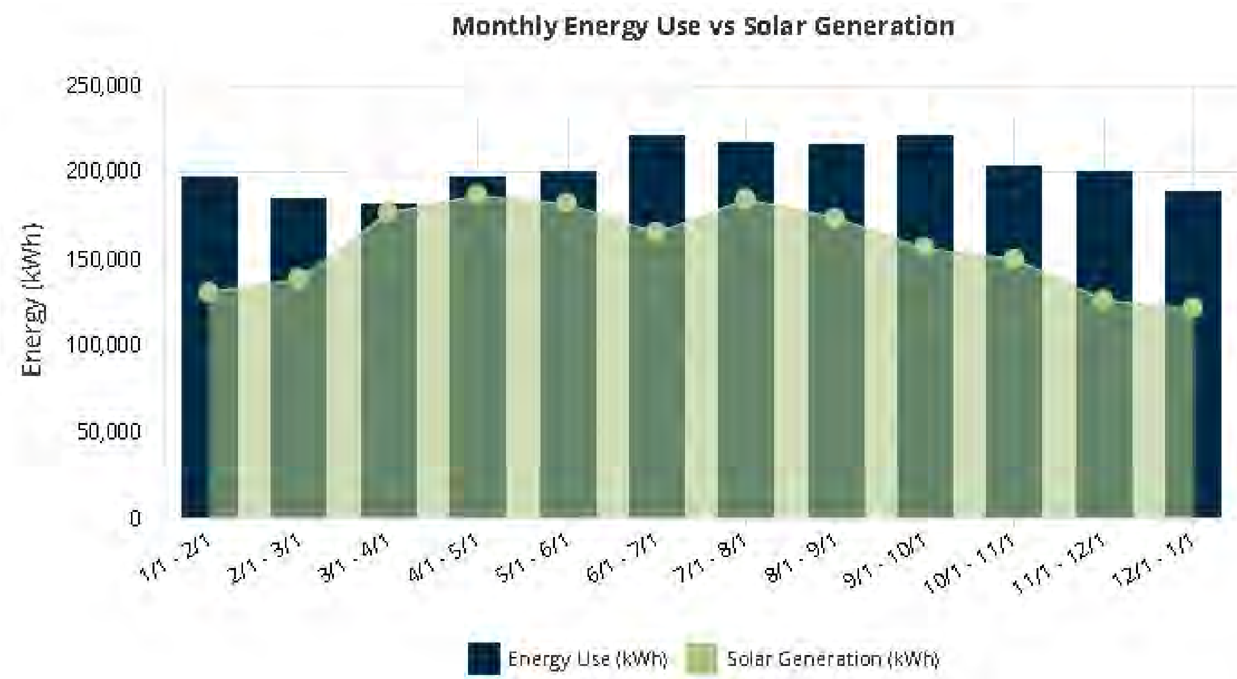
Solar Panels: Greater than 30 Years, Inverters: 15 Years



Solar PV System Rating

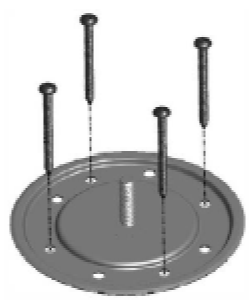
System Peak Power: 1242.7 kW DC (1217.846 kW AC, 1113.971 kW CEC)

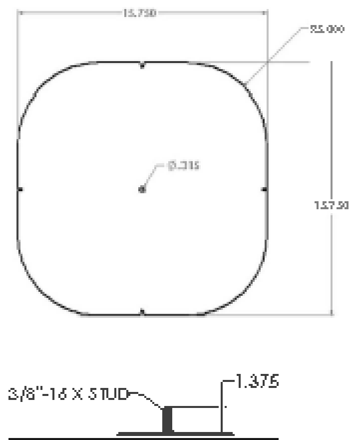
Annual Site Energy Use: 2,430,800 kWh



The North Regional Courthouse is easily adaptable for solar in that it has a modified built-up roof as found throughout Broward County with minor roof obstructions to work around. The building will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.

The **modified built-up** roof will have a partially ballasted and partially anchored system in place. Solar panels will be mounted facing south at a 10-degree tilt. Solar panels are mounted on custom racking that also contains ballast trays where special concrete blocks are placed to accent the anchor attachments. The anchor attachments are efficiently designed to be as least invasive to the buildings as possible. A “u-anchor” or sometimes referred to as “o-mount” is placed directly on the roof surface and screwed through the decking rather than cut down through. From there, an exact piece of matching roof material is placed over the post and heat welded to the roof surface and sealed with the appropriate material to create a continuous surface as though they were put on at the time of initial roof installation. 





The **inverters** will be mounted in locations recommended by the contractor but ultimately decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses where Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The picture seen below showcases the proposed solar panel layout in multiple field segments atop the North Regional Courthouse roof. The design includes 3655 Solar PV panels and total panel area of 78,094 sq. ft. The design incorporates maintenance access to roof equipment. The final panel layout may change due to field conditions, and/or, Broward County approval during final design phase.

BO30 - Government Center West

Project Description:

The Government Center West Solar PV installation is utilizing the available roof space on the roof. There is room for 307.3 kW solar installation at this facility. The flexible design has 904 solar panels at 350 watts each. The flat roof with open space provides plenty of room for a solar electric system, see panel layout plan in this section.

This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

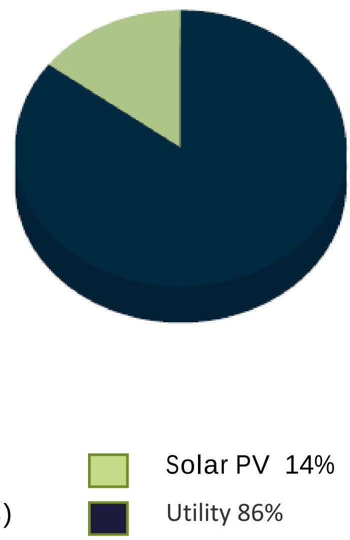
Solar PV Panels: 904 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 6 x Solectria Renewables, Model: PVI 50TL-480

Total Panel Area: 19,315 sq-ft

Solar PV Equipment Typical Lifespan

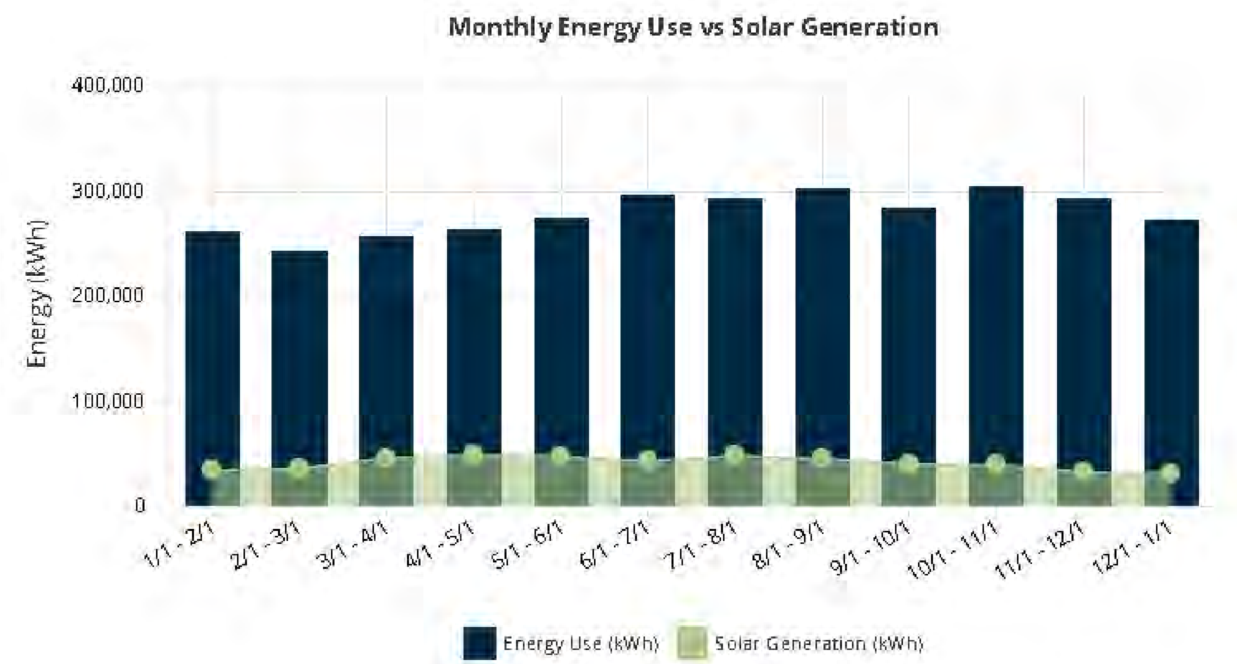
Solar Panels: Greater than 30 Years, Inverters: 15 Years



Solar PV System Rating

System Peak Power: 307.36 kW DC (302.75 kW AC, 276.927 kW CEC)

Annual Site Energy Use: 3,335,282 kWh



The Government Center West facility is easily adaptable for solar in that it has a modified built-up roof as found throughout Broward County with minor roof obstructions to work around. The building will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.

The **modified built-up roof with gravel coating** will have a partially ballasted and partially anchored system in place. Solar panels will be mounted facing south at a 10-degree tilt. Solar panels are mounted on custom racking that also contains ballast trays where special concrete blocks are placed to accent the anchor attachments. The anchor attachments are efficiently designed to be as least invasive to the buildings as possible. A “u-anchor” or sometimes referred to as “o-mount” is placed directly on the roof surface and screwed through the decking rather than cut down through. From there, an exact piece of matching roof material is placed over the post and heat welded to the roof surface and sealed with the appropriate material to create a continuous surface as though they were put on at the time of initial roof installation.

The **inverters** will be mounted in locations recommended by the contractor but ultimately decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses -where Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The below seen picture showcases the proposed solar panel layout in multiple field segments atop the Government Center West's roof. The design includes 904 Solar PV panels and total panel area of 19,315 sq. ft. The design incorporates maintenance access to roof equipment. The final panel layout may change due to field conditions, and/or, upon Broward County's acceptance during final design phase.

BO31 - Traffic Engineering Administration North

Project Description:

The Traffic Engineering Administration North's Solar PV installation is utilizing the available roof space on the roof. There is room for 392.3 kW solar installation at this facility. The flexible design has 1154 solar panels at 350 watts each. The flat roof and metal roof with open roof space provide plenty of room for a solar electric system, see panel layout plan in this section.

This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

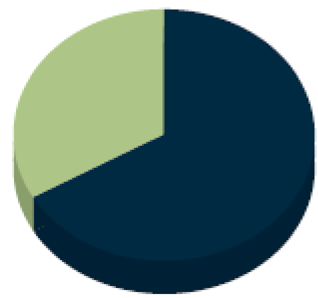
Solar PV Panels: 1154 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 17 x Solectria Renewables, Model: PVI 28TL-480

Total Panel Area: 24,657 sq-ft

Solar PV Equipment Typical Lifespan

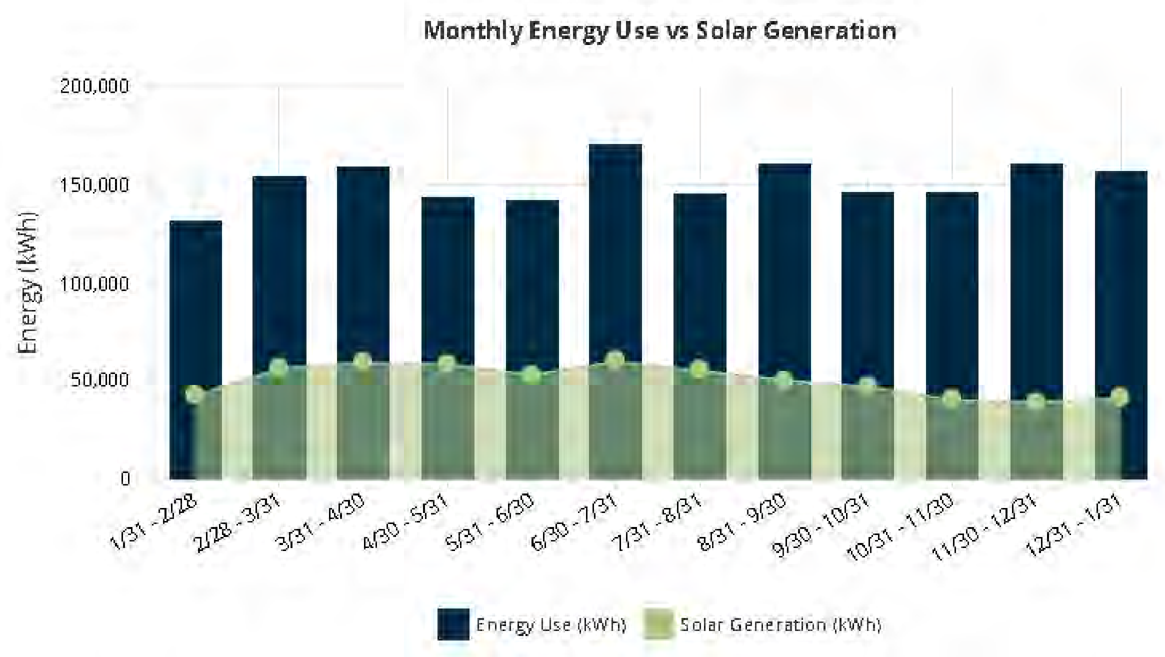
Solar Panels: Greater than 30 Years, Inverters: 15 Years



Solar PV System Rating

System Peak Power: 392.36 kW DC (384.513 kW AC, 351.716 kW CEC)

Annual Site Energy Use: 1,816,388 kWh



The Traffic Engineering Administration North facility is easily adaptable for solar in that it has a modified built-up roof as found throughout Broward County with minor roof obstructions to work around. The building will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.

The **modified built-up roof with gravel coating** will have a partially ballasted and partially anchored system in place. Solar panels will be mounted facing south at a 10-degree tilt. Solar panels are mounted on custom racking that also contains ballast trays where special concrete blocks are placed to accent the anchor attachments. The anchor attachments are efficiently designed to be as least invasive to the buildings as possible. A "u-anchor" or sometimes referred to as "o-mount" is placed directly on the roof surface and screwed through the decking rather than cut down through. From there, an exact piece of matching roof material is placed over the post and heat welded to the roof surface and sealed with the appropriate material to create a continuous surface as though they were put on at the time of initial roof installation.

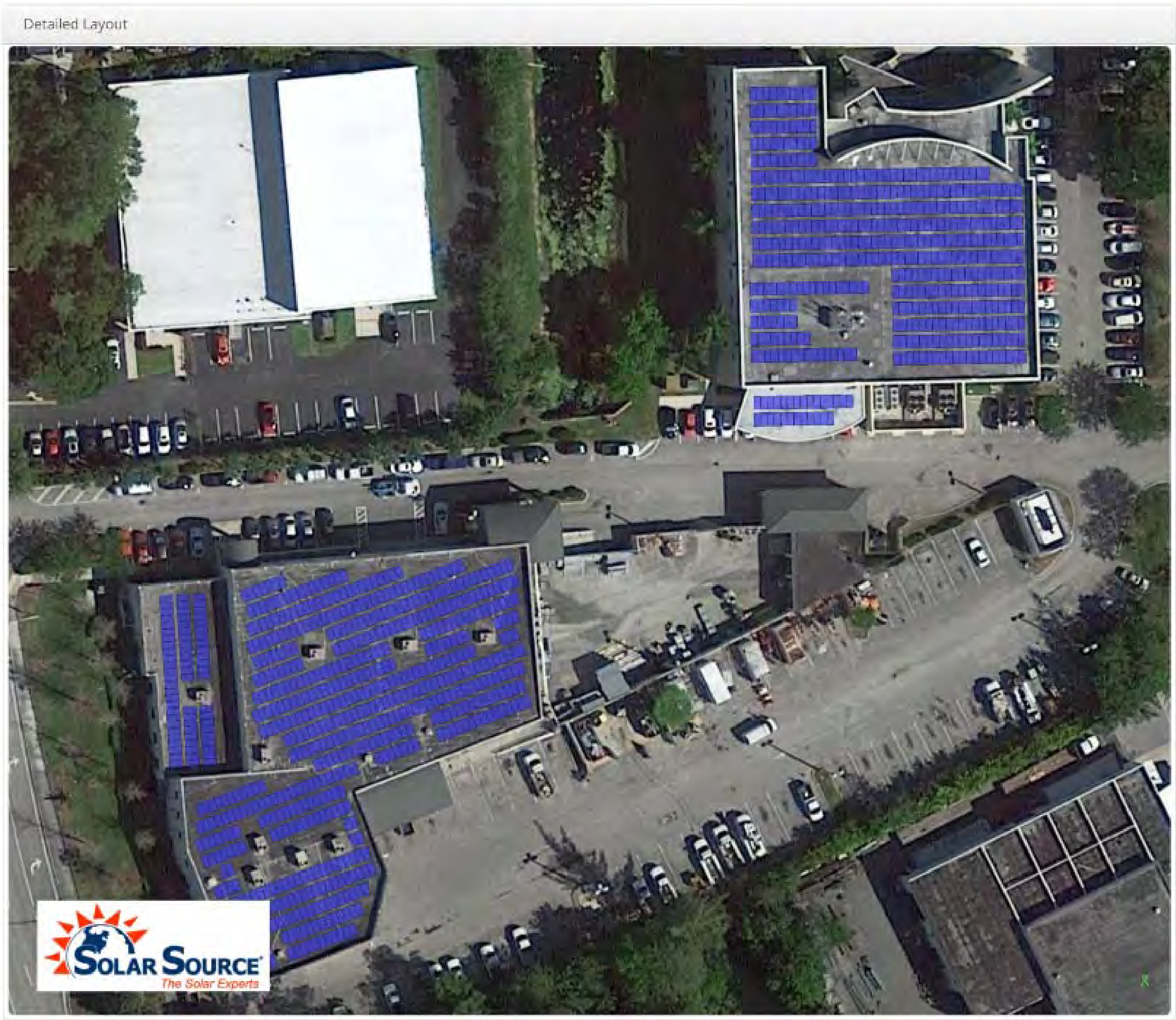
The **inverters** will be mounted in locations recommended by the contractor but ultimately decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses where Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The below picture shows proposed Traffic Engineering Administration North solar panel layout in multiple field segments on two roofs. The design includes 1154 Solar PV panels, with a total panel area of 24,657 sq. ft. The design incorporates maintenance access to roof equipment. The final panel layout may change due to field conditions, and/or, upon Broward County's acceptance during final design phase.



BH37 - Family Success Center, North, Pompano

Project Description:

The Family Success Center, North Pompano facility's Solar PV installation is utilizing the available roof space on the roof. There is room for 70.7 kW solar installation at this facility. The flexible design has 208 solar panels at 350 watts each. The three flat roofs with open space provide plenty of room for a solar electric system, see panel layout plan in this section.

This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

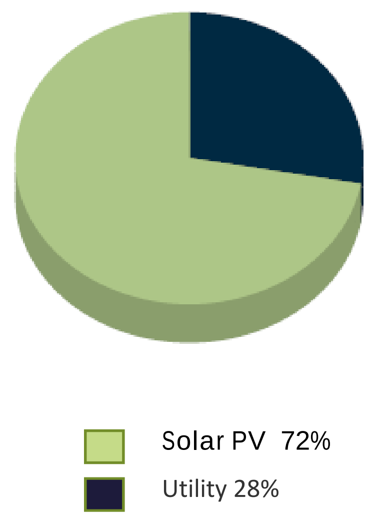
Solar PV Panels: 208 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 3 x Solectria Renewables, Model: PVI 23TL-480

Total Panel Area: 4,444 sq-ft

Solar PV Equipment Typical Lifespan

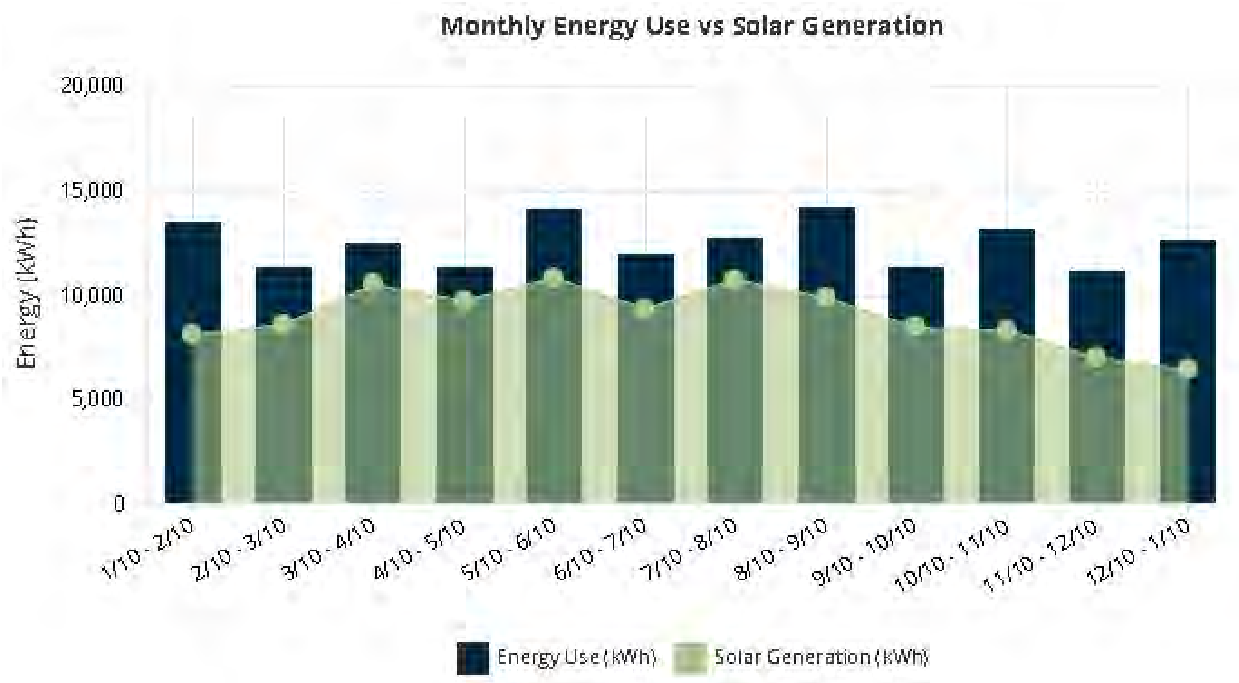
Solar Panels: Greater than 30 Years, Inverters: 15 Years



Solar PV System Rating

System Peak Power: 70.72 kW DC (69.306 kW AC, 63.394 kW CEC)

Annual Site Energy Use: 149,276 kWh



The Family Success Center, North Pompano facility is easily adaptable for solar in that it has a modified built-up roof as found throughout Broward County with minor roof obstructions to work around. The building will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.

The **modified built-up roof** will have a partially ballasted and partially anchored system in place. Solar panels will be mounted facing south at a 10-degree tilt. Solar panels are mounted on custom racking that also contains ballast trays where special concrete blocks are placed to accent the anchor attachments. The anchor attachments are efficiently designed to be as least invasive to the buildings as possible. A "u-anchor" or sometimes referred to as "o-mount" is placed directly on the roof surface and screwed through the decking rather than cut down through. From there, an exact piece of matching roof material is placed over the post and heat welded to the roof surface and sealed with the appropriate material to create a continuous surface as though they were put on at the time of initial roof installation.

The **inverters** will be mounted in locations recommended by the contractor but ultimately decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses where Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The picture seen below showcases the proposed solar panel layout on the Family Success Center, North Pompano facility - seen in multiple field segments on three roofs. The design includes 208 Solar PV panels with a total panel area of 4,444 sq. ft. The design incorporates maintenance access to roof equipment. The final panel layout may change due to field conditions, and or, Broward County's approval during final design phase.

Detailed Layout

BR41 - Mass Transit North Maintenance

Project Description:

The Mass Transit North Maintenance facility's Solar PV installation is utilizing the available roof space on two roofs. There is ample room for 747.6 kW solar installation at this facility. The flexible design has 2199 solar panels at 350 watts each. The flat roof and metal roof with open roof space provide plenty of room for a solar electric system, see panel layout plan in this section.

This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

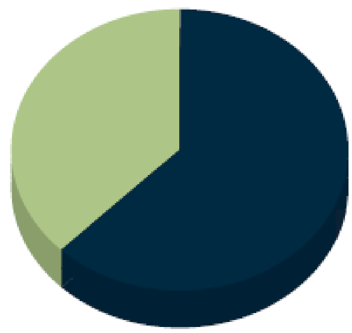
Solar PV Panels: 2199 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 32 x Solectria Renewables, Model: PVI 28TL-480

Total Panel Area: 46,985 sq-ft

Solar PV Equipment Typical Lifespan

Solar Panels: Greater than 30 Years, Inverters: 15 Years

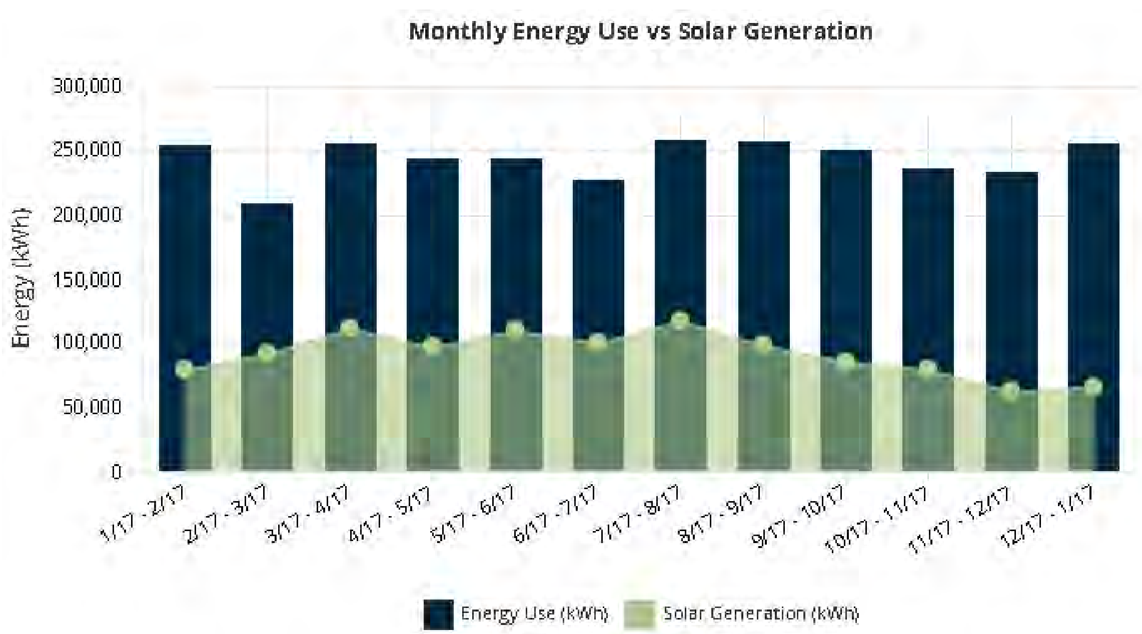


Solar PV 38%
Utility 62%

Solar PV System Rating

System Peak Power: 747.66 kW DC (732.707 kW AC, 670.211 kW CEC)

Annual Site Energy Use: 2,920,591 kWh



The Mass transit North Maintenance facility is interesting in that there are two types of structures on the property connected to one another as one facility, but with two different roof types. The good news is that both types of roof styles, when used in conjunction with solar panels, will minimize penetrations through the surface. The buildings will accept standard solar installation materials and techniques, making them straightforward to install and ideal for future service by any knowledgeable professional.

The first, the **modified built-up roof with gravel coating**, will have a partially ballasted and partially anchored system in place. Solar panels in this zone will be mounted facing south at a 10-degree tilt. Solar panels are mounted on custom racking that also contains ballast trays where special concrete blocks are placed to accent the anchor attachments. The anchor attachments are efficiently designed to be as least invasive to the buildings as possible. A "u-anchor" or sometimes referred to as "o-mount" is placed directly on the roof surface and screwed through the decking rather than cut down through. From there, an exact piece of matching roof material is placed over the post and heat welded to the roof surface and sealed with the appropriate material to create a continuous surface as though they were put on at the time of initial roof installation.

The second attachment method will be on the **metal standing seam roofs**. Panels will be flush mounted on the existing east/west roof slopes. The solar industry uses special clamps, such as those provided by S-5, for a variety of seam types. The clamps attach directly to the metal seams, and the solar rail that supports the panels is attached to the top of the clamps. This eliminates the need to penetrate the roof to attach the solar system.

The **inverters** will be mounted in locations recommended by the contractor but ultimately decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs. Although the system is currently pre-engineered, it is expected that panels will be tied to different utility meters on the property, as utility requirements for interconnection and value-engineering will dictate during that process.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses where Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The picture seen below shows the proposed Mass transit North Maintenance facility's solar panel layout in multiple field segments. The design includes 2199 Solar PV panels and total panel area of 46,985 sq. ft. The design incorporates maintenance access to roof equipment. The final panel layout may change due to field conditions, and/or, Broward County's approval during final design phase.

BR43 - BCJC South Parking Garage

Project Description:

The BCJC South Parking Garage facility's Solar PV installation is utilizing the available roof space on the roof. There is ample room for 228.1 kW solar installation at this facility. The flexible design has 671 solar panels at 350 watts each. The top floor of parking garage provides plenty of room for a solar electric system on shadeport setting, see panel layout plan in this section.

This solar installation consists of following components.

Solar PV Equipment Description

Panel Tilt: 10 degrees, Azimuth: 180 degrees, 3" Air Gap

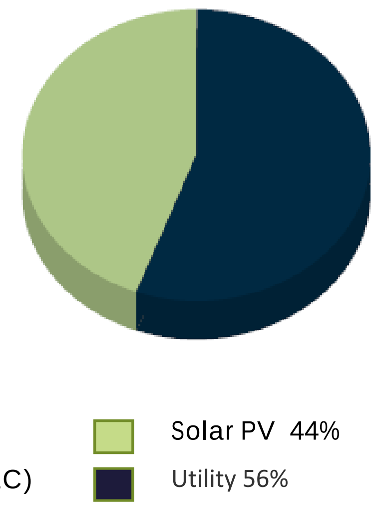
Solar PV Panels: 671 x Mission Solar Energy, Model: MSE340SQ6W

Inverters: 9 x Solectria Renewables, Model: PVI 23TL-480

Total Panel Area: 14,337 sq-ft

Solar PV Equipment Typical Lifespan

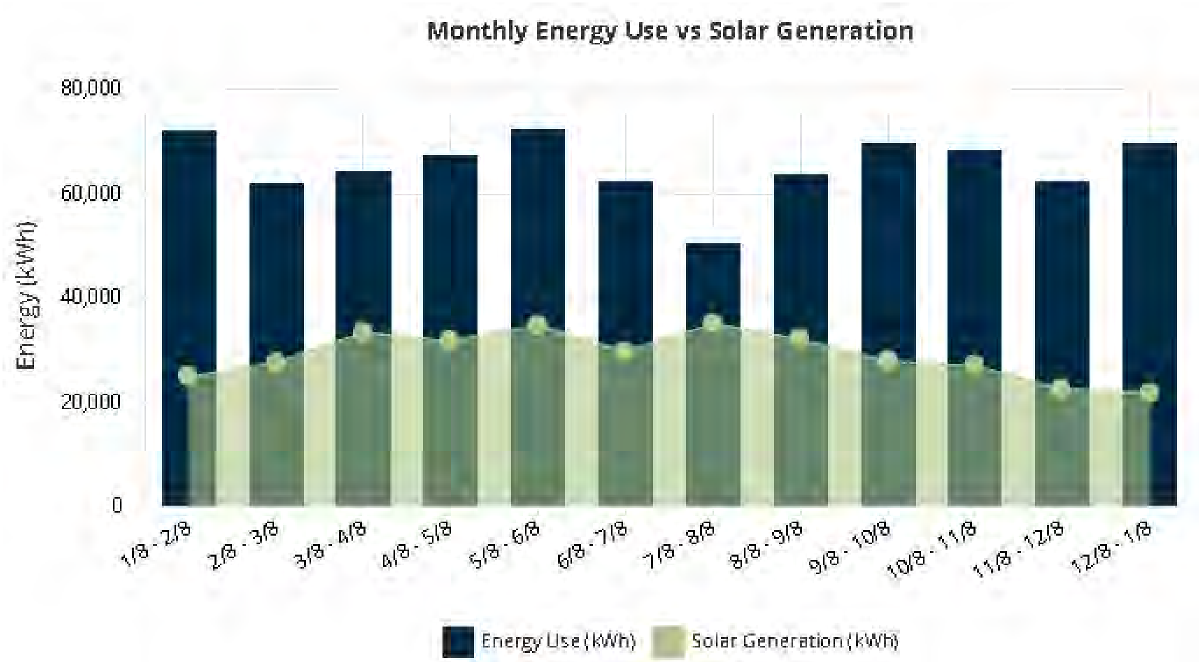
Solar Panels: Greater than 30 Years, Inverters: 15 Years



Solar PV System Rating

System Peak Power: 228.14 kW DC (223.577 kW AC, 204.507 kW CEC)

Annual Site Energy Use: 781,812 kWh



This BCJC South Parking Garage facility is easily adaptable for solar in that it has top floor dedicated for parking. The canopy installation will not reduce parking spaces and it will provide shading for top floor. The building will accept standard solar installation materials and techniques, making it straightforward to install and ideal for future service by any knowledgeable professional.

The **shadeport** installation proposed is following same design and planning approach as Tampa International Airport installation show on the pictures. The final material selection may change during design phase depending on field conditions. The final product will be similar to the configuration shown on the pictures.

The **inverters** will be mounted in locations recommended by the contractor but ultimately decided by Broward County. Inverters are ideally placed as close to the panels strung to them as possible, to allows for shorter DC runs, which have less voltage drop than longer AC runs.

For monitoring purposes, a **data acquisition system** will be installed that will allow for web-based monitoring of the system performance. This will allow the production information to be displayed anywhere Broward County chooses where Internet service is available.

Upon completion of the project and all inspections passed, the utility will be engaged to install **bi-directional meters** anywhere solar energy is tied to. The bi-directional (net meter) is basically the cash register of the solar system. It allows for credit to be earned for any energy that goes back out into the grid, so that Broward County receives the full benefit of all the solar kWh they generate.

Panel Layout:

The picture seen below shows the proposed BCJC South Parking Garage facility's solar panel layout in multiple field segments on top floor of the parking garage. The design includes 671 Solar PV panels and total panel area of 14,337 sq. ft. The design follows car parking patterns and provides for maintenance access to equipment. The final panel layout may change due to field conditions, and/or, upon Broward County's approval during final design phase.

Detailed Layout

OTHER UPGRADES

OpTerra performed an audit of all existing building/HVAC equipment and controls for the Group B buildings. This section list ECMs that were not covered under previous sections.

The existing equipment was inspected and noted as to age, reliability and efficiency. Once all of the equipment was evaluated, the OpTerra team then proceeded with developing practical solutions to improve any underlining problems and areas that stand out for potential energy savers.

Upgrades and improvement to the other energy using equipment, listed in this section, will result in the following benefits for Broward County.

Benefits of these ECMs include:

- Deferred maintenance
- Operational savings
- Increased reliability

ECM 01: Surge Protection

ECM Description:

This ECM is providing surge protection to HVAC equipment to avoid down time of equipment due to surges in electrical distribution system. A surge is a high-amplitude, short-duration electrical fluctuation that can cause harm to electrical, electromechanical, and electronic equipment. Surges are caused by lightning, utility events, and internal events. It was reported by the staff that this area has frequent lighting storms and that the units in question have been down due to power surges several times in 2017.

Energy Savings:

This ECM has no energy savings. The benefits are in avoided costs in emergency repairs due to surge damage, and at minimum, the avoided cost of a service call to reset the controls due to surge or power disruption.

O&M Impact/Benefits:

Equipment reliability will be increased. Problems associated with spikes and surges will be reduced or eliminated. Resulting in reduced repair costs. No additional O&M cost are expected from this measure.

Condensing Units to Receive Surge Protectors:

This ECM will install new surge protectors for CU-3 and CU-4 at Ann Kolb Nature Center. The Condensing units that receive protectors are serving Mangrove Hall. The protectors will be installed next to the electrical panel providing power to the condensing units.

ID	Site	Building	Tag	Location	Repair description
BP6	West Lake / AK	Mangrove Hall	CU-3	Outside Unit	Install Surge Protector
BP7	West Lake / AK	Mangrove Hall	CU-4	Outside Unit	Install Surge Protector

3. Historical Energy Use

This section of the report contains the electric and water usage history for each of the Broward County facilities assigned to OpTerra. Historical data was provided by Broward County and supplemented with more recent electrical data from FPL and water data from the county utilities department and the municipalities in which the various facilities are located. Data was not available for the two homeless shelters and the Southwest Regional Library because the county does not pay these utility bills. Natural gas data was not provided because it is used at only a few sites and is unaffected by the proposed energy conservation measures.

Electrical Usage

Electricity is provided to the facilities by Florida Power and Light (FPL). Some sites have multiple meters that measure the electricity consumed at the site. There are 133 meters at the 46 assigned sites. Of these, the 12 Parks have about 60% of the meters due to their spread-out nature.

FPL has established several rate schedules, or tariffs, to calculate the amount its customers pay for usage. The time and quantity that energy is consumed by the meter dictates the rate schedule that the electricity consumed at a meter is billed. Table 3-1 lists each site along with the corresponding FPL rate code. These rates along with a brief description is provided below:

- GS-1: General Service Non-Demand
  - Billed for kWh usage at all times (kW demand < 20 kW)
- GSD-1, GSLD-1: General Service Demand and General Service Large Demand
  - Billed for kWh usage and kW demand at all times
    - GSD-1 (20 kW < kW Demand < 500 kW)
    - GSLD-1 (500 kW < kW Demand < 2000 kW)
- GSDT-1: General Service Demand with Time-of-Use
  - Same as GSD-1 & GSLD-1 but kW and kWh is billed according to pre-established on-peak and off-peak times
- SDTR-1A: Seasonal Demand with Time-of-Use Rider
  - Same as GSDT-1 but with different pre-established peak times.
- CILC-1D: Commercial and Industrial Load Control Program
  - Provides a rate reduction for random FPL load control events.

TABLE 3-1
FPL ELECTRIC RATE TARIFFS

	Site	FPL RATE CODE
PARKS	Central Broward Regional	SDTR-1A, GS-1, GSD-1
	Topeekeegee Yungee	SDTR-1A, GS-1, GSD-1
	Easterlin	GS-1, GSD-1
	Tree Tops	GS-1, GSD-1
	Long Key	SDTR-1A, GS-1
	West Lake / Anne Kolb NC	SDTR-1A, GS-1, GSD-1
	Brian Piccolo	SDTR-1A, GS-1
	Fern Forest	GS-1, GSD-1
	Plantation Heritage	GS-1, GSDT-1
	Secret Woods	GS-1, GSD-1
	Hollywood North Beach	GS-1
	Saw Palmetto	GS-1
LIBRARIES	African American	GSDT-1
	Southwest Regional	
	West Regional	GSD-1
	Northwest Regional	GSD-1
	Weston	GSD-1
	Lauderdale Lakes	GSD-1
	Stirling Road	SDTR-1A
	North Lauderdale	GSD-1
	Dan Pearl	GSD-1
	Margate	GSD-1
	Hallandale	SDTR-1A
	Century Plaza	GS-1, GSD-1
	Dania Beach	SDTR-1A
	Carver Ranches	GSD-1
	Pompano Northwest Branch	GSD-1
OFFICE & COURTHOUSE	Public Safety complex-Public Safety Building	CILC-1D
	Public Safety complex-BSO District 5	GSLD-1
	Public Safety complex-Evidence Warehouse	GSD-1
	Public Safety complex-Logistics Warehouse	SDTR-1A
	North Regional Courthouse	GSLD-1
	Government Center West	GSLDT-1
	Traffic Engineering Administration North	SDTR-1A, GSDT-1
	Park Administration Complex	GSD-1
	South Broward Landfill	SDTR-1A, GS-1
HEALTH AND LAB	Central Homeless Assistance Center	
	Booher Building	GSDT-1
	North Homeless Assistance Center	
	North Family Success Center, Pompano	GS-1, GSD-1
	Sexual Assault Treatment Center	GSD-1
	EPD Environmental Monitoring Facility & Lab	SDTR-1A
	EAP Our House	GS-1
PARKING, WAREHOUSE & REPAIR	Mass Transit North Maintenance	GSDT-1
	BSO Maintenance Facility	SDTR-1A
	BCJC South Parking Garage	GSD-1
	Highway & Bridge Mosquito Control	GSD-1
	South Maintenance Shop	GS-1
	Mass Tansit Northeast Terminal	GSD-1

Energy cost savings are based on the applicable FPL rate tariff for each site. Besides billing its customers for kWh usage and kW demand, FPL also adds a conservation charge, environmental charge, storm charge, a highly variable and frequently adjusted fuel cost recovery charge, and government-imposed fees and taxes. These additional charges were added to the base energy usage and demand charges for each rate tariff to determine the effective rates to be applied to the predicted energy savings. Sample bills were obtained from FPL to compare and confirm the rate calculation methodology. Table 3-2 shows the effective unit costs for kWh and kW demand for each rate tariff.

Because the parks have multiple meters, many of which are billed at different rates, a blended rate calculation was developed, also shown in Table 3-2.

Table 3-2
FPL EFFECTIVE RATES

TARIFF CODE	Year Round (Or Summer if Seasonal Rate)			Winter (If Seasonal Rate)	
	On-Peak kW	On-Peak kWh	Off-Peak kWh	Off-Peak kW	Off-Peak kWh
GS-1	-	$0.10144	-	-	-
GSD-1	$11.52	$0.05846	-	-	-
GSDT-1	$11.52	$0.08558	$0.04652	-	-
SDTR-1A	$12.49	$0.13734	$0.05044	$11.19	$0.05846
CILC-1D	$9.57	$0.04866	$0.04279	-	-
GSLD-1	$11.95	$0.05365	-	-	-
GSLDT-1	$13.45	$0.06791	$0.04640	-	-
Central Broward Regional	-	$0.11515	-	-	-
Topeekeegee Yungee	-	$0.11400	-	-	-
Easterlin	-	$0.14214	-	-	-
Tree Tops	-	$0.09719	-	-	-
Long Key	-	$0.12836	-	-	-
West Lake / Anne Kolb NC	-	$0.08750	-	-	-
Brian Piccolo	-	$0.17259	-	-	-
Fern Forest	-	$0.10806	-	-	-
Plantation Heritage	-	$0.11310	-	-	-
Secret Woods	-	$0.11216	-	-	-
Hollywood North Beach	-	$0.10565	-	-	-
Saw Palmetto	-	$0.20329	-	-	-

Water Usage

Water and sewer service is provided to the various sites by Broward County Water & Wastewater Services (WWS) as well as several municipal utility departments. Some of the historical usage data was initially provided by the County; however, most of it was obtained directly from the service providers. The historical data applicable to this project is in the appendices. Unfortunately, for three sites the municipalities were unable to provide this data.

A reasonable benchmark was needed to calculate the energy cost savings because of the many different water & sewer rate schedules affecting this project, as shown in Table 3-3. The utility provider for many sites is Broward WWS, whose rates are near average. As such, WWS' rate structure was used (before the recent rate increase) to calculate energy cost savings.

Table 3-3
Water & Sewer Volumetric Rates
($ per 1,000 gallons)

Utility Provider	Water	Sewer	Total
Broward County WWS	$4.90	$3.98	$8.88
Coral Springs	$2.70	$4.09	$6.79
Davie	$5.64	$6.60	$12.24
Deerfield Beach[1]			
Fort Lauderdale	$5.04	$6.93	$11.97
Hallandale[1]			
Hollywood	$6.43	$9.53	$15.96
Margate	$4.41	$5.45	$9.86
North Lauderdale	$3.54	$4.16	$7.70
Oakland Park	$6.68	$5.34	$12.02
Plantation	$5.74	$4.93	$10.67
Pompano Beach	$3.38	$2.85	$6.23
Sunrise	$4.18	$4.03	$8.21
Average	$4.78	$5.26	$10.05
Used for savings calculations	$4.73		$8.59

Note 1: Information unavailable

Historical Energy Use

Table 3-4 summarizes the energy usage, costs, energy usage index, and energy cost index for each site. For water, only those sites affected by this project and having historical data are shown. Between one and three years of historical data was obtained and compiled and is included in the appendices.

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

Table 3-4
Broward County - Group B Sites
Annual Utility Summary

Site	Area (sf)	Avg. Electric Monthly Demand (kW)	Electric Use (kWh)	Water kgal	kWh/ sf	MCF/ sf	Electric Btu/sf	Total Btu/sf	Electric $	El. $/KWH	Water $	Water $/kgal	Total $	$/sf
PARKS														
Central Broward Regional	50,516	670	1,577,766	-	31.23	-	106,598	106,598	$169,268	$0.1073	$0		$169,268	$3.35
Topeekeegee Yungee	44,378	361	1,580,703	-	35.62	-	121,568	121,568	$147,077	$0.0930	$0		$147,077	$3.31
Easterlin	36,194	50	284,961	812	7.87	-	26,871	26,871	$27,006	$0.0948	$15,759	$19.41	$42,765	$1.18
Tree Tops	26,103	72	307,209	45	11.77	-	40,168	40,168	$29,343	$0.0955	$75,123	N/A	$104,467	$4.00
Long Key[4]	23,591	88	290,538	28	12.32	-	42,033	42,033	$30,170	$0.1038	$1,417	$50.62	$31,588	$1.34
West Lake / Anne Kolb NC	20,776	131	580,983	-	27.96	-	95,442	95,442	$50,787	$0.0874	$0		$50,787	$2.44
Brian Piccolo	11,706	533	453,964	-	38.78	-	132,358	132,358	$80,761	$0.1779	$0		$80,761	$6.90
Fern Forest	9,893	34	99,551	-	10.06	-	34,344	34,344	$11,124	$0.1117	$0		$11,124	$1.12
Plantation Heritage	7,674	58	189,933	-	24.75	-	84,472	84,472	$20,421	$0.1075	$0		$20,421	$2.66
Secret Woods	7,257	35	105,832	-	14.58	-	49,773	49,773	$11,412	$0.1078	$0		$11,412	$1.57
Hollywood North Beach	4,000	-	69,108	645	17.28	-	58,966	58,966	$8,363	$0.1210	$10,558	$16.37	$18,921	$4.73
Saw Palmetto	160	-	1,227	-	7.67	-	26,163	26,163	$230	$0.1874	$0		$230	$1.44
PARK TOTALS	242,248	2,032	5,541,772	1,530	22.88	-	78,077	78,077	$585,962	$0.1057	$102,857	$67.23	$688,820	$2.84
LIBRARIES														
African American	61,150	321	1,671,600	-	27.34	-	93,298	93,298	$132,002	$0.0790	$0		$132,002	$2.16
Southwest Regional[1]	79,747				-	-	-	-						
West Regional	72,000	275	1,395,480	-	19.38	-	66,150	66,150	$114,809	$0.0823	$0		$114,809	$1.59
Northwest Regional	72,000	337	1,396,080	-	19.39	-	66,178	66,178	$123,220	$0.0883	$0		$123,220	$1.71
Weston	51,000	288	1,102,020	-	21.61	-	73,749	73,749	$100,460	$0.0912	$0		$100,460	$1.97
Lauderdale Lakes	20,237	88	313,410	-	15.49	-	52,857	52,857	$29,505	$0.0941	$0		$29,505	$1.46
Stirling Road	20,000	82	405,342	-	20.27	-	69,172	69,172	$34,121	$0.0842			$34,121	$1.71
North Lauderdale	20,000	118	490,980	-	24.55	-	83,786	83,786	$43,395	$0.0884			$43,395	$2.17
Dan Pearl	19,500	107	404,700	-	20.75	-	70,833	70,833	$37,605	$0.0929			$37,605	$1.93
Margate	15,800	82	447,960	621	28.35	-	96,765	96,765	$36,293	$0.0810	$9,991	$16.09	$46,283	$2.93
Hallandale	14,700	62	305,400	162	20.78	-	70,907	70,907	$26,402	$0.0864	$1,294	$7.99	$27,696	$1.88
Century Plaza	11,682	43	190,189	64	16.28	-	55,565	55,565	$17,485	$0.0919	$835	$13.05	$18,320	$1.57
Dania Beach	9,970	42	233,832	-	23.45	-	80,047	80,047	$19,365	$0.0828			$19,365	$1.94
Carver Ranches	16,700	92	298,440	100	17.87	-	60,993	60,993	$29,268	$0.0981	$2,063	$20.74	$31,331	$1.88
Pompano Northwest Branch	10,000	57	216,270	-	21.63	-	73,813	73,813	$19,971	$0.0923			$19,971	$2.00
LIBRARY TOTALS	494,486	1,993	8,871,702	947	17.94	-	61,234	61,234	$763,902	$0.0861	$14,183	$14.98	$778,085	$1.57
OFFICE AND COURTHOUSE														
Public Safety Complex - Public Safety Building	253,076	954	6,328,860	13,182	25.01	-	85,351	85,351	$367,264	$0.0580	$97,419	$7.39	$464,682	$1.84
Public Safety Complex - BSO D5 Office	20,250	102	658,260	213	32.51	-	110,945	110,945	$48,401	$0.0735	$4,656	$21.86	$53,056	$2.62
Public Safety Complex - Inventory & Evidence Bldgs	20,704	63	285,120	-	13.77	-	47,001	47,001	$24,139	$0.0847			$24,139	$1.17
Public Safety Complex - Logistics Warehouse	6,690	18	114,840	-	17.17	-	58,587	58,587	$8,950	$0.0779			$8,950	$1.34
North Regional Courthouse	200,000	417	2,448,200	2,203	12.24	-	41,779	41,779	$192,152	$0.0785	$22,657	$10.29	$214,809	$1.07
Government Center West	184,820	587	3,389,640	3,335	18.34	-	62,595	62,595	$215,041	$0.0634	$35,381	$10.61	$250,422	$1.35
Traffic Engn Administration North	71,346	342	2,364,660	950	33.14	-	113,119	113,119	$172,549	$0.0730	$12,235	$12.88	$184,784	$2.59
Park Administration Complex	35,296	76	325,530	612	9.22	-	31,478	31,478	$29,317	$0.0901	$8,879	$14.51	$38,196	$1.08
South Broward Landfill	17,847	166	998,826	-	55.97	-	191,012	191,012	$78,571	$0.0787			$78,571	$4.40
OFFICE & COURTHOUSE TOTALS	810,029	2,725	16,913,936	20,494	20.88	-	71,266	71,266	$1,136,383	$0.0672	$181,227	$8.84	$1,317,610	$1.63
HEALTH AND LAB														
Central Homeless Assistance Center[3]	63,244				-	-	-	-		#DIV/0!				
Booher Building	53,060	259	1,680,570	6,085	31.67	-	108,100	108,100	$126,221	$0.0751	$52,797	$8.68	$179,018	$3.37
North Homeless Assistance Center[2]	44,254				-	-	-	-		#DIV/0!				
Family Success Center, N. Pompano	11,929	33	244,320	-	20.48	-	69,902	69,902	$23,660	$0.0968			$23,660	$1.98
Sexual Assault Treatment Center	10,643	44	182,730	-	17.17	-	58,598	58,598	$16,442	$0.0900			$16,442	$1.54
EPD Environmental Monitoring Facility & Laboratory	9,694	151	986,940	377	101.81	-	347,475	347,475	$75,219	$0.0762	$12,657	$33.57	$87,876	$9.07
EAP Our House	1,127	-	15,676	17	13.91	-	47,473	47,473	$1,665	$0.1062	$381	$22.41	$2,046	$1.82
HEALTH AND LAB TOTALS	193,951	488	3,110,236	6,479	16.04	-	54,732	54,732	$243,207	0.0781958	$65,835	$10.16	$309,042	$1.59
PARKING, WAREHOUSE AND REPAIR														
Mass Transit North Maintenance	195,189	481	3,424,613	-	17.55	-	59,881	59,881	$249,319	$0.0728			$249,319	$1.28
BSO Maintenance Facility	14,800	40	233,160	-	15.75	-	53,769	53,769	$18,646	$0.0800			$18,646	$1.26
BCJC South Parking Garage	14,397	110	921,717	-	64.02	-	218,505	218,505	$73,602	$0.0799			$73,602	$5.11
HIGH & BRDG Mosquito Control, Pembroke	9,865	24	109,047	-	11.05	-	37,727	37,727	$9,552	$0.0876			$9,552	$0.97
South Maintenance Shop	6,024	-	75,671	-	12.56	-	42,873	42,873	$7,828	$0.1034			$7,828	$1.30
Mass Transit Northeast Terminal	2,000	22	111,300	-	55.65	-	189,933	189,933	$9,455	$0.0850			$9,455	$4.73
PARKING, WAREHOUSE & REPAIR TOTALS	242,275	678	4,875,507	-	20.12	-	68,683	68,683	$368,402	$0.0756			$368,402	$1.52
GROUP B TOTALS	1,982,989	7,915	39,313,152	29,450	19.83	-	67,663	67,663	$3,097,857	$0.0788	$364,102	$12.36	$3,461,959	$1.75

1 - Electricity and chilled water provided by Charter School attached to building. County is billed by the City of Pembroke Pines; however, this data was not made available to OpTerra.
2 - Annual cost for utility was obtained from the site. Utility usage estimated based upon using average cost for utilities.
3 - No utility data was available. Utility usage estimated based upon the energy indice of the North Homeless Assistance Center.
4 - An electric meter inaccuracy was found at this site. As a result, baseline data was established using the period of Jan-2013 thru July-2015.

4. Data on Present Facilities

Introduction

Data relevant to energy consumption requirements for the facilities included in the project where energy conservation measures were analyzed, are covered in this section. The data was collected on a facility-by-facility basis. A survey team visited facilities listed in the “Group B” listing of facilities in which we were responsible for auditing, to identify potential opportunities for both energy and water cost reductions. Areas of concern encompassed factors that have an impact on the consumption of thermal energy, electrical energy, and water usage. The survey considered building envelope, heating, ventilation, and air-conditioning (HVAC) equipment, lighting, and miscellaneous energy consuming equipment, as well as sink faucets, showerheads, irrigation, urinals and toilets. Information was collected on building use schedules, HVAC equipment usage, lighting use schedules, and water flow rates. Available plans and HVAC control drawings for each building were reviewed to augment data collected during the survey.

CB Regional Park
3700 NW 11th PL, Lauderhill, FL 33311

Area: 50,516 sf

Year Built: 2007

Major Additions: None

Wall Type: Concrete, CMU

Roof Type: Metal and built-up roofing.

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule: 8:00 am to 7:30 pm, Monday through Sunday. Extended hours on events.

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that are in either the air handling units, mounted in the ductwork, or located inside the package units.

Cooling Source: Air-cooled 106 Ton scroll chiller provides chilled water to the stadium building. Maintenance building is cooled by a packaged unit, pool building and gate house are cooled by split systems.

Air Handling Units: Sixteen Carrier air handling units and two dedicated outside air units serve the Field House.

HVAC System Controls: Stadium HVAC system utilizes a Carrier Building Automation System (BAS) that was installed when the building was constructed. Other HVAC units are controlled by local thermostats.

CB Regional Park
HVAC Equipment Inventory

Chiller Summary Table

Building	Tag	Manufacturer	Model	Serial	Type	Nominal Tons	Compressor					Condenser Fans				
							#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
Field House	CH-1	Carrier	30RBA11068	2107Q83675	Scroll	106	2	460	41.6	3	R-410A	6	3.6	460	5	3
							3	460	32.7	3	R-410A					

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Motor				Cooling Coil	Heating Coil	Manf. Date	Area
			HP	Volts	Amps	Phase	Type	Type		Served
OA1-1	Carrier	39LB06	2.0	460	n/a	3	CHW	N/A	2007	Field House 1st Floor
OA1-2	Carrier	39LB06	2.0	460	n/a	3	CHW	N/A	2007	Field House 1st Floor
AHU1-1	Carrier	42BHC202	1.0	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 1st Floor
AHU1-2	Carrier	42BHC202	1.0	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 1st Floor
AHU1-3	Carrier	42BHC202	1.0	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 1st Floor
AHU1-4	Carrier	42BHC121	0.5	460	n/a	3	CHW	Elect. 2 kW	2007	Field House 1st Floor
AHU1-5	Carrier	42BHC121	0.5	460	n/a	3	CHW	Elect. 2 kW	2007	Field House 1st Floor
AHU1-6	Carrier	42BHC121	0.5	460	n/a	3	CHW	Elect. 3 kW	2007	Field House 1st Floor
AHU1-7	Carrier	42BHC061	0.3	460	n/a	3	CHW	Elect. 2 kW	2007	Field House 1st Floor
OA2-1	Carrier	39LB06	2.0	460	n/a	3	CHW	N/A	2007	Field House 2nd Floor
OA2-2	Carrier	39LB06	2.0	460	n/a	3	CHW	N/A	2007	Field House 2nd Floor
AHU2-1	Carrier	40RMS008	2.4	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 2nd Floor
AHU2-2	Carrier	42BHC082	0.3	460	n/a	3	CHW	Elect. 2.5 kW	2007	Field House 2nd Floor
AHU2-3	Carrier	40RMS008	2.4	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 2nd Floor
AHU2-4	Carrier	40RMS008	2.4	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 2nd Floor
AHU2-5	Carrier	40RMS008	2.4	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 2nd Floor
AHU2-6	Carrier	42BHC162	0.5	460	n/a	3	CHW	Elect. 3 kW	2007	Field House 2nd Floor
AHU2-7	Carrier	42BHC121	0.5	460	n/a	3	CHW	Elect. 2 kW	2007	Field House 2nd Floor
AC-1 Gate	Carrier	N/A		208/230	n/a	1	DX	Elect.	2007	Gate House
AC-1 Pool	Thermal Zone	Mini-Split indoor unit		208/230	0.09	1	DX	N/A	2007	Pool House
AC-2 Pool	Thermal Zone	Mini-Split indoor unit		208/230	0.4	1	DX	N/A	2007	Pool House
AC-3 Pool	Thermal Zone	Mini-Split indoor unit		208/230	0.4	1	DX	N/A	2011	Pool House

Rooftop/Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Rated Htg. Output MBH	Supply Fan					Compressor					Condenser Fans					Comments
						Qty	HP	Volts	Amps	Phase	Qty	Volts	Amps	Phase	Refrig.	Qty	HP	Volts	Amps	Phase	
RTU-1	Carrier	50HC-D08A2B6 A0A0A0	1213G30157	7.5	14 kW	1		460	3.4	3	2	460	6.1	3	R-410A	2		460	0.8	1	Maintenance

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Motor				Cooling Coil	Heating Coil	Manf. Date	Area
			HP	Volts	Amps	Phase	Type	Type		Served
OA1-1	Carrier	39LB06	2.0	460	n/a	3	CHW	N/A	2007	Field House 1st Floor
OA1-2	Carrier	39LB06	2.0	460	n/a	3	CHW	N/A	2007	Field House 1st Floor
AHU1-1	Carrier	42BHC202	1.0	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 1st Floor
AHU1-2	Carrier	42BHC202	1.0	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 1st Floor
AHU1-3	Carrier	42BHC202	1.0	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 1st Floor
AHU1-4	Carrier	42BHC121	0.5	460	n/a	3	CHW	Elect. 2 kW	2007	Field House 1st Floor
AHU1-5	Carrier	42BHC121	0.5	460	n/a	3	CHW	Elect. 2 kW	2007	Field House 1st Floor
AHU1-6	Carrier	42BHC121	0.5	460	n/a	3	CHW	Elect. 3 kW	2007	Field House 1st Floor
AHU1-7	Carrier	42BHC061	0.3	460	n/a	3	CHW	Elect. 2 kW	2007	Field House 1st Floor
OA2-1	Carrier	39LB06	2.0	460	n/a	3	CHW	N/A	2007	Field House 2nd Floor
OA2-2	Carrier	39LB06	2.0	460	n/a	3	CHW	N/A	2007	Field House 2nd Floor
AHU2-1	Carrier	40RMS008	2.4	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 2nd Floor
AHU2-2	Carrier	42BHC082	0.3	460	n/a	3	CHW	Elect. 2.5 kW	2007	Field House 2nd Floor
AHU2-3	Carrier	40RMS008	2.4	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 2nd Floor
AHU2-4	Carrier	40RMS008	2.4	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 2nd Floor
AHU2-5	Carrier	40RMS008	2.4	460	n/a	3	CHW	Elect. 8 kW	2007	Field House 2nd Floor
AHU2-6	Carrier	42BHC162	0.5	460	n/a	3	CHW	Elect. 3 kW	2007	Field House 2nd Floor
AHU2-7	Carrier	42BHC121	0.5	460	n/a	3	CHW	Elect. 2 kW	2007	Field House 2nd Floor
AC-1 Gate	Carrier	N/A		208/230	n/a	1	DX	Elect.	2007	Gate House
AC-1 Pool	Thermal Zone	Mini-Split indoor unit		208/230	0.09	1	DX	N/A	2007	Pool House
AC-2 Pool	Thermal Zone	Mini-Split indoor unit		208/230	0.4	1	DX	N/A	2007	Pool House
AC-3 Pool	Thermal Zone	Mini-Split indoor unit		208/230	0.4	1	DX	N/A	2011	Pool House

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1	AC-1 Gate	Carrier	24ABR318	3507E05577	1.5	13.0	1	208/230	7.7	1	R-22	1	1/12	208/230	0.5	1	2007
CU-1 Pool	AC-1 Pool	Thermal Zone	MS212A13240CA	N/A	1	12.0	1	208/230	4.1	1	R-22	1		208/230	0.22	1	2007
CU-2 Pool	AC-2 Pool	Thermal Zone	Can't read the plate	N/A	2	13.0	1	208/230		1	R-22	1		208/230		1	2007
CU-3 Pool	AC-3 Pool	Thermal Zone	MSC424A13230CA	N/A	2	13.0	1	208/230	10	1	R-410A	1		208/230	0.9	1	2011

Topeekeegee Yugnee Park
3300 N. Park RD., Hollywood, FL 33021

Area: 44,378 sf

Year Built: Various

Major Additions: 1998

Wall Type: CMU w/Stucco Finish

Roof Type: Mostly metal, warehouse has built-up roofing

Window Type: Buildings have been added over the years but majority has single pane with metal frame.

Lighting Type: This facility utilized many different lighting technologies including Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

November 5, 2017 through March 10, 2018 8 am to 6 pm
March 11, 2018 through November 3, 2018 8 am to 7:30 pm
Park Office, Year Round, Daily 9 am to 5:30 pm

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that are in either the air handling units, mounted in the ductwork, or located inside the package units.

Cooling Source: Cooling is provided by split DX units or wall AC units. Condensing unit are air cooled DX unit and serving single indoor/air-handling units.

Air Handling Units (Original Building): Cooling is by split DX units with associated indoor (AHU) unit.

HVAC System Controls: Split units are controlled by thermostats/programmable units.

TY Park
HVAC Equipment Inventory

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-2	Park Office	Goodman	GSC101203AB	0905695725	10	11.2	1	208/230	30.1	3	R-22	1	1	208/230	5	3	2009
CU-1	Park Office	Rheem	RAWD-100CAZ	6239F480306979	10	10.0	1	208/230	37.8	3	R-22	2	1/3	208/230	2.2	1	2003
CU-1 Pool	Pool Snack Bar	Carrier	PA13NR018	1611X70189	1.5	11.0	1	208/230	8.3	1	R-22	1	1/12	208/230	0.5	1	2011
CU-2 Pool	Pool Snack Bar	Daikin	RKN24NMVJU	G001331	1.8	12.3	1	208/230	12	1	R-410A	1	1/10	208/230	0.53	1	2015
CU-3 Pool	Pool Snack Bar	Daikin	RKN24NMVJU	G001353	1.8	12.3	1	208/230	12	1	R-410A	1	1/10	208/230	0.53	1	2015
CU-4 Pool	Pool RR & Office	Carrier	NXA436GKC101	E163415908	3	11.7	1	208/230	13.6	1	R-410A	1	1/5	208/230	1.1	1	2015
CU-1 Maint	Maintenance	York	H2RD0428068	W0F6568521	3.5	11.1	1	208/230	13.5	1	R-22	1	1/4	208/230	1.5	1	2006
CU-1 Camp	Campground	AAON	CA1277	200702-CCC695941	6	11.0	2	208	10.7	3	R-22	1	3/4	208	5.4	1	2007
CU-1 Gate	Gate	York	2H2RD0186068	W0B2416419	1.5	11.0	1	208/230	6.4	1	R-22	1	1/8	208/230	0.8	1	2002

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				HP	Volts	Amps	Phase	Type	Type		Served
AHU-1	Rheem	RHGE-100ZL	153F510312382	2.00	208/230	6.8	3	DX	Elect. 10kW	2003	Park Office
AHU-2	Goodman	AR120AA	0810010894	2.00	208/230	6	3	DX	Elect. 14kW	2008	Park Office
AHU-1 Pool	Carrier	FA4ANC018		0.10	208/230	0.9	1	DX	Elect.	n/a	Pool Snack Bar
AHU-2 Pool	Daikin	FTKN24NMVJU			208/230	0.5	1	DX	N/N	2015	Pool Snack Bar
AHU-3 Pool	Daikin	FTKN24NMVJU			208/230	0.5	1	DX	N/N	2015	Pool Snack Bar
AHU-4 Pool	ICP	FMA4P3600AT	V160368275	0.50	208/230	1.8	1	DX	Elect 5kW	2015	Pool RR and Office
AHU-1 Maint	York	N/A			208/230	N/A	1	DX		2006	Miantenance
AHU-1 Camp	AAON	V2-B1-2-56-3A1	200702-CBEB02298	1.00	208	4.6	3	DX	Elect. 5kW	2007	Campground
AHU-1 Gate	York	N/A			208/230	N/A	1	DX		2002	Gate

Wall Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Rated Htg. Output MBH	Supply Fan					Compressor					Manuf Date	Comments
						Qty	HP	Volts	Amps	Phase	Qty	Volts	Amps	Phase	Refrig.		
WU-1	Friedrich	CP10G10B	N/A	0.8	N/A	1		115		1	1	115		1	R-410A	2003	Swim Central. - Age estimated
WU-2	Friedrich	CP10G10B	N/A	0.8	N/A	1		115		1	1	115		1	R-410A	2003	Swim Central.
WU-3	Friedrich	CP08G10B	N/A	0.7	N/A	1		115		1	1	115		1	R-410A	2003	Swim Central.
WU-4	Friedrich	CP08G10B	N/A	0.7	N/A	1		115		1	1	115		1	R-410A	2003	Swim Central.
WU-5	Friedrich	CP08G10B	N/A	0.7	N/A	1		115		1	1	115		1	R-410A	2003	Swim Central.

Easterlin Park
1000 NW 38th ST., Oakland Park, FL 33309

Area: 36,194 sf

Year Built: Park opened 1965

Major Additions: New park office building in 2014.

Wall Type: CMU w/Stucco Finish

Roof Type: Metal

Window Type: Double pane with metal frames

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

November 5, 2017 through March 10, 2018 8 am to 6 pm
March 11, 2018 through November 3, 2018 8 am to 7:30 pm
Park Office, Year Round, Daily 9 am to 5:30 pm

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that are in either the air handling units, mounted in the ductwork, or located inside the package units.

Cooling Source: Air-handling units utilize direct expansion condensers to cool the facility.

Air Handling Units: Four Carrier air-handling units serve the entire building, including computer area.

HVAC System Controls: Programmable thermostats and Carrier BAS are utilized to control the air-handling units and outside air dampers that serve the building.

Easterlin Park
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				HP	Volts	Amps	Phase	Type	Type		
AC-1	Carrier	FV4CNB006L00ABAA	4114A86610	0.75	208/230	6.8	1	DX	Elect. 6kW	2014	Office Bldg.
AC-2	Carrier	FV4CNB006L00ABAA	4114A86577	0.75	208/230	6.8	1	DX	Elect. 6kW	2014	Office Bldg.
AC-3	Carrier	FV4CNF003L00ABAA	3314A89199	0.50	208/230	4.3	1	DX	Elect. 3.75kW	2014	Office Bldg.
AC-4	Carrier Toshiba	Same as CU		0.21	208/230	0.75	1	DX		2014	Office Bldg.

DX Condenser / Compressor Summary

Tag	*Equipment Served*	*Manufacturer*	*Model*	*Serial*	*Tons*	*New EER/SEER*	*Compressor*					*Condenser Fans*					*Manf. Date*
							#	*Volts*	*Amps*	*Phase*	*Refrigerant*	*#*	*HP*	*Volts*	*Amps*	*Phase*	
CU-1	AC-1	Carrier	24ABB360A520	4214E15478	3	11.5	1	208/230	16	3	R-410A	1	1/4	208/230	1.4	1	2014
CU-2	AC-2	Carrier	24ABB360A520	4214E15481	3	11.5	1	208/230	16	3	R-410A	1	1/4	208/230	1.4	1	2014
CU-3	AC-3	Carrier	24ABB330A510	3314E09137	2.5	11.5	1	208/230	8.3	3	R-410A	1	1/4	208/230	0.1	1	2014
CU-4	AC-4	Toshiba Carrier	RAS-12EAV-UL	42200247	1.9	11.0	1	208/230	11	1	R-410A	1	2/7	208/230	0.1	1	2014

Tree Tops Park
3900 SW 100th AVE., Davie, FL 33328

Area: 26,103 sf

Year Built: 1983

Major Additions: Various

Wall Type: CMU w/Stucco Finish, wood frame

Roof Type: Metal

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

November 5, 2017 through March 10, 2018 8 am to 6 pm
March 11, 2018 through November 3, 2018 8 am to 7:30 pm
Park Office, Year Round, Daily 9 am to 5:30 pm

HVAC System Types:

Heating Source: Air handling units utilize electronic strip heat to provide heating to the building.

Cooling Source: Air-cooled chillers utilize chilled water to provide cooling to the building. Split system utilize direct expansion to provide cooling to portions of the building.

Air Handling Units: York air handling units and Rheem split systems serve the buildings.

HVAC System Controls: Electronic and programmable thermostats are utilized to control the equipment in the building.

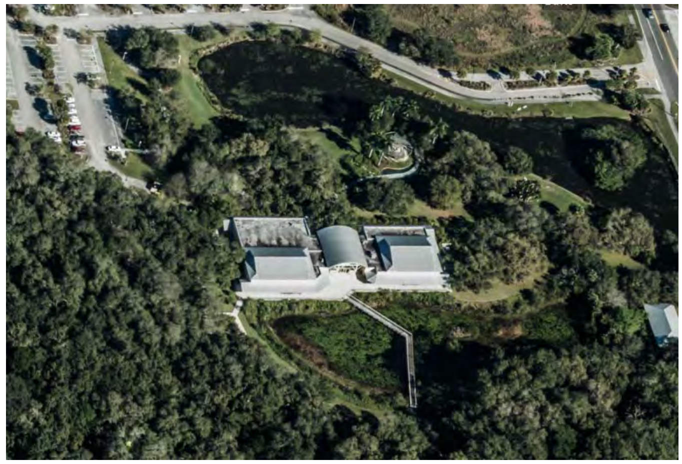
Plantation Heritage Park
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				HP	Volts	Amps	Phase	Type	Type		
AHU-1	Rheem	RHGL-120ZL	F061712099	2.00				DX	Elect.	2017	Admin offices
AHU-2	York	XTI-045X078	CCEMXT0049	5.0	460	6.6	3	DX	Elect.	Unk	Hall

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1	AHU-1	Rheem	RA1460AC1NB	W341616298	5	13.0	1	230	15.9	3	410A	1	1/5	230	1.4	3	2016
CU-2	AHU-2	Rheem	RA1460AC1NB	W391614598	5	13.0	1	230	15.9	3	410A	1	1/5	230	1.4	3	2016



Long Key Nature Area
3501 SW 130th AVE, Davie, FL 33330

Area: 23,591 sf

Year Built: 2007

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Built-up roofing and metal

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule: 9:00 am to 5:00 pm, Monday through Sunday, Closed on Christmas Day only.
Special events may vary regular operating times.

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that are in either the air handling units, mounted in the ductwork, or located inside the package units.

Cooling Source: Air-handling units utilize direct expansion condensers to cool the facility. There are two double circuit AHU units served by one or two separate condensing units.

Air Handling Units: Seven Carrier air-handling units serve the entire building.

HVAC System Controls: Electronic and programmable thermostats are utilized to control the air-handling units that serve this building.

Long Key Nature Area
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				HP	Volts	Amps	Phase	Type	Type		
AHU-1	Carrier	40RM012-B611HC	3707U29204	2.40	460	2.6	3	DX	10 kW	2007	East End Exhibit
AHU-3	Carrier	40RM008-B611HC	3807U29923	2.40	460	2.6	3	DX	10 kW	2007	East End Theater
AHU-4	Carrier	40RM012-B611HC	3707U29203	2.40	460	2.6	3	DX	10 kW	2007	West End Lobby
AHU-5	Carrier	40RM008-B611HC	3707U29128	2.40	460	2.6	3	DX	10 kW	2007	West End Kitchen
AHU-6	Carrier	40RM024-B611HC	3707U29163	5.00	460	6.4	3	DX	20 kW	2007	West End - Assembly Hall
AHU-7	Carrier	FK4DNF005	4907A86836	0.50	208/230	4.3	1	DX	7.6 kW	2007	Maintenance

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrig.	#	HP	Volts	Amps	Ph	
AC-1	AHU-1	Carrier	38ARD012-601	0507G40134	8.7	11.0	2	460	8	3	R-22	2	1/4	460	0.7	1	2007
AC-3A	AHU-3	Carrier	24ABR342A610	1207E01459	3.5	11.2	1	460	6	3	R-22	2	1/4	460	0.7	1	2007
AC-3B	AHU-3	Carrier	24ABR342A610	1207E01457	3.5	11.2	1	460	6	3	R-22	2	1/4	460	0.7	1	2007
AC-4	AHU-4	Carrier	38ARD012-601	3507G20071	8.7	11.0	2	460	8	3	R-22	2	1/4	460	0.7	1	2007
AC-5	AHU-5	Carrier	38ARZ008-601	3907G10140	7	11.0	1	460	13	3	R-22	2	1/4	460	0.7	1	2007
AC-6	AHU-6	Carrier	38ARD024-601	3407G10057	18.1	11.0	2	460	19.2	3	R-22	2	7/10	460	2.1	1	2007
AC-7	AHU-7	Carrier	24ABR336A3	4907E01258	3	11.2	1	208/230	14.4	1	R-22	1	1/5	208/230	1.1	1	2007

Rooftop/Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Rated Htg. Output MBH	Supply Fan					Compressor					Condenser Fans					Manuf Date
						Qty	HP	Volts	Amps	Ph	Qty	Volts	Amps	Ph	Refrig.	Qty	HP	Volts	Amps	Ph	
AC-2 (RTU)	Carrier	50HJ-014-V651	4107G10640	12.5	11 kW	1	7.5	460	7.4	3	2	460	9	3	R-22	2	0.25	460	0.7	1	2007
AC-1	Carrier	50HJ-006-V631	4307G40316	5	5 kW	1	2	460	3.4	3	1	460	9	3	R-22	1	0.25	460	0.8	3	2007

West Lake / Anne Kolb NC Park
751 Sheridan ST., Hollywood, FL 33019

Area: 20.776 sf

Year Built: 1982 West Lake Park

Major Additions: Anne Kolb Nature Center

Wall Type: CMU w/Stucco Finish

Roof Type: Metal and cement tile

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

November 5, 2017 through March 10, 2018 — 8 am to 6 pm
March 11, 2018 through November 3, 2018 — 8 am to 7:30 pm
Park Office, Year Round, Daily 9 am to 5:30 pm
West Lake Marina, daily, 9 am to 5 pm

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that are in either the air handling units, mounted in the ductwork, or located inside the package units.

Cooling Source: Air-handling units utilize direct expansion condensers to cool the facility. The pump room at AK and Marina have DX units.

Air Handling Units: Seven Carrier air-handling units serve the entire AK area, Marina has split DX unit.

HVAC System Controls: Electronic and programmable thermostats are utilized to control the air-handling units that serve this building. Anne Kolb Nature Center has Barber-Coleman Network 8000 BAS.

West Lake / Ann Kolb Nature Center

HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served	Comments
				HP	Volts	Amps	Phase	Type	Type			
AHU-1	Carrier	40RM-012-B600GC	1695F43326	2.40	460	2.6	3	DX		1996	AK Visitor Center	Mech Rm.
AHU-2	Carrier	40RM-012-B600GC	1395F40189	2.4	460	2.6	3	DX		1996	AK Visitor Center	Mech Rm.
AHU-3	Carrier	40RUAA28A5A6A0A0A0	3213U31111	10.00	460	15	3	DX	Elect. 4kW	2013	AK Assembly Hall	Next to kitchen
AHU-4	Carrier	40RUAA28A5A6A0A0A0	3813U35173	10.00	460	15	3	DX	Elect. 4kW	2013	AK Assembly Hall	East end
AHU-5	Carrier	40RR-024	0495F30035	3.00	230/460	10.1/5.0	3	DX		1995	AK Exhibit Hall	Mech Rm.
AHU-6	Carrier	40RUAA28A5A6	3813U35171	10.00	460	15	3	DX		2015	AK Exhibit Hall	Mech Rm.
AHU-7P	Rheem	RBHB-24J07SH4	N081500486	0.75	208/240	4.2	1	DX	Elect. 5.3kW	2015	AK Exhibit Hall Pump Rm.	Pump Rm.
AHU-1M	Carrier	40RM-008-B600GC	1295F39015	2.50	208/230			DX		1996	WL Marina	Mech. Rm.

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrigerant	#	HP	Volts	Amps	Ph	
CU-1	AHU-1	Carrier	38ARS012-K611	1007G40091	10.0	11.0	1	460	18	3	R-22	2	3/7	460	0.7	1	2007
CU-2	AHU-2	Carrier	38ARS012-K611	0808G30154	10.0	11.0	1	460	18	3	R-22	2	3/7	460	0.7	1	2008
CU-3	AHU-3	Carrier	38APS02565-10020	4313Q49289	24.0	11.0	2	460	18.6	3	R-410A	2	1 3/4	460	3.3	3	2013
CU-4	AHU-4	Carrier	38APS02565-10020	4313Q49248	24.0	11.0	2	460	18.6	3	R-410A	2	1 3/4	460	3.3	3	2013
CU-5	AHU-5	Carrier	38AKS024-K621	3408G20001	18.0	10.0	1	460	34.7	3	R-22	2	3/4	460	2.1	3	2008
CU-6	AHU-6	Carrier	38APS02565-10020	4313Q49263	24.0	11.0	2	460	18.6	3	R-410A	2	1 3/4	460	3.3	3	2015
CU-7P	AHU-7P	Rheem	RAKA-048JAZ	5432F210240257	4.0	10.0	1	208/230	21.9	1	R-22	1	1/3	208/230	2	1	2002
CU-1 Marina	AHU-1 Marina	Carrier	N/A	N/A	7.5	9.0	1	208/230			R-22	1		208/230			1996

Rooftop/Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Rated Htg. Output	Supply Fan					Compressor					Condenser Fans					Manuf Date	Comments
						Qty	HP	Volts	Amps	Ph	Qty	Volts	Amps	Ph	Refrig.	Qty	HP	Volts	Amps	Ph		
HP-1	Daikin	RXN09KEVJU5	G001081	0.8	11.6	1		208/230		1	1	208/230	3.7	1	R-410A	1	0.044	208/230	0.17	1	2013	Gatehouse

<u>**Brian Piccolo Park**</u>

9501 Sheridan ST., Cooper City, FL 33024

Area: 11,706 sf

Year Built: 1989

Major Additions: Velodrome in 1992

Wall Type: CMU w/Stucco Finish

Roof Type: Rolled asphalt with fiberglass

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

November 5, 2017 through March 10, 2018 — 8 am to 6 pm
March 11, 2018 through November 3, 2018 — 8 am to 7:30 pm
Park Office, Year Round, Daily 9 am to 5:30 pm

HVAC System Types:

Heating Source: Air Handling units utilize electric heat to provide heating to the building.

Cooling Source: Air Handling units utilize direct expansion units to provide cooling to the building.

Air Handling Units: Air-handling units (split system) serve Park Office, Tennis Center and Skate Park.

HVAC System Controls: Electronic thermostats and programmable thermostats are utilized to control the equipment with in the buildings.

Brian Piccolo Park

HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				HP	Volts	Amps	Ph	Type	Type		
AHU-1	Rheem	RHSA-HM4221JA	M1308 03510	0.50	208/240	5.2	1	DX	5.4 kW	2008	Admin
AHU-2	Carrier	FX4DNF037T00ABAA	4013A83737	0.5	208/230	4.1	1	DX	6 kW	2013	Office
AHU-3	Carrier	FE5ANB004T00ABAA	4613A83316	0.75	208/230	6.8	1	DX	6 kW	2013	Office
AHU-1 SP	Rheem	RHGE-075ZK	139G3298 00489	1.00	460	1.8	3	DX	N/A	1998	Skate Park Bldg.
AHU-1 TC	Goodman	ARUF384216AB	7077119	0.50	208/240	2.86	1	DX	Elect.	2007	Tennis Center Shop

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrigerant	#	HP	Volts	Amps	Ph	
CU-1	AHU-1	Rheem	13AJA42A01	7280N370702101	3.5	11.2	1	208/230	19.2	1	R-22	1	1/6	208/230	0.8	1	2007
CU-2	AHU-2	Carrier	24ABC630A300	4313E05837	2.5	12.8	1	208/230	12.8	1	R-410A	1	1/10	208/230	0.75	1	2013
CU-3	AHU-3	Carrier	24ANB124A310	4613E15813	2	14.7	1	208/230	11.1	1	R-410A	1	1/5	208/230	1.88	1	2013
CU-1 SP	AHU-1 SP	Rheem	RAWD-076DAZ	6417F060410941	7.5	9.9	1	460	14.7	3	R-22	1	1/3	460	1.3	3	2004
CU-1 TC	AHU-1 TC	Goodman	N/A	N/A		11.0	1	208/240			R-22	1		208/240			2007

Fern Forest Park
4800 SW 4th ST., Margate, FL 33063

Area: 9,893 sf

Year Built: 2007

Major Additions: None

Wall Type: Wood frame / CMU

Roof Type: Rolled asphalt with fiberglass

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule: 9:00 am to 5:00 pm, year-round. Closed on Christmas Day.

HVAC System Types:

Heating Source: Air Handling units and RTU units utilize electric heat to provide heating to the building.

Cooling Source: First floor air Handling units utilize direct expansion units on the roof. Two RTU provide cooling to the upper floor.

Air Handling Units: Air-handling units (split system) with electric heat serve first floor.

HVAC System Controls: Electronic thermostats and programmable thermostats are utilized to control the equipment with in the buildings.

Fern Forest Nature Center

HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				HP	Volts	Amps	Phase	Type	Type		
AHU-1	Trane	TWE048P13FB0	53035612V	0.50	200/230	3.3	1	DX	Elct. 7.2 kW	2005	Nature Center
AHU-2	Trane	TWE048P13FB0	52955L01V	0.50	200/230	3.3	1	DX	Elct. 7.2 kW	2005	Nature Center

DX Condenser / Compressor Summary

Tag	Equipment Served	Make	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrigerant	#	HP	Volts	Amps	Ph	
CU-1	AHU-1	Trane	2TTA2048A3000AB	51215GK3F	4.0	11.0	1	200/230	15	3	HCFC-22	1	1/6	200/230	1.4	1	2005
CU-2	AHU-2	Trane	2TTA2048A3000AB	51215HD3F	4.0	11.0	1	200/230	15	3	HCFC-22	1	1/6	200/230	1.4	1	2005

Rooftop/Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Rated Htg. Output MBH	Supply Fan					Compressor					Condenser Fans					Manuf Date
						Qty	HP	Volts	Amps	Ph	Qty	Volts	Amps	Ph	Refrig.	Qty	HP	Volts	Amps	Ph	
RTU-1	Trane	THC092A3RCA02D2	532100022L	7.5	Elect. 9kW	1	2	208	6.3	3	2	208	12.4	3	R-22	1	2	208	6.3	3	2005
RTU-2	Trane	THC092A3RCA1GA000A	532100101L	7.5	Elect. 9kW	1	2	208	6.3	3	2	208	12.4	3	R-22	1	2	208	6.3	3	2005

Plantation Heritage Park
1100 S Fig Tree LN., Plantation, FL 33317

Area: 7,674 sf

Year Built: 1992

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Build-up roofing

Window Type: Single pane with metal frames and solar screens

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

November 5, 2017 through March 10, 2018 8 am to 6 pm
March 11, 2018 through November 3, 2018 8 am to 7:30 pm
Park Office, Year Round, Daily 9 am to 5:30 pm

HVAC System Types:

Heating Source: Air handling units utilize electric strip heat provide heating to the building.

Cooling Source: Air handling units utilizes direct expansion to provide cooling to the building.

Air Handling Units: Air handling units serve the main building.

HVAC System Controls: Programmable thermostats are utilized to control the equipment in the building.

Plantation Heritage Park
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil Type	Heating Coil Type	Manf. Date	Area Served
				HP	Volts	Amps	Ph				
AHU-1	Unknown										Hall
AHU-2	Trane	2TEH3F36A	6214KJ21V	0.5	230	4				2006	Office
AHU-3	American Std	2TEH3F42A	6211ML52V	0.50	230	4.1				2006	Hall

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Phase	Refrig.	#	HP	Volts	Amps	Ph	
CU-1	AHU-1	Rheem	TZAA-342-2C757	W431413720	3.5		1	230	19.2	1		1	1/6	230	0.8	1	2014
CU-2	AHU-2	Rheem	TZAA-336-2A757	W101400134	3		1	230	15.9	1		1	1/6	230	0.8	1	2014
CU-3	AHU-3	Am. Std	TTA090A400FA	62255U9AD	7.5		1	460	13.2	3		1		460	1.6		

Secret Woods Park

2701 W. State RD., Dania Beach, FL 33312

Area: 7,257 sf

Year Built: Unknown

Major Additions: None

Wall Type: CMU, wood frame

Roof Type: Metal and asphalt shingle

Window Type: Single pane with metal frames and clear

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule: 9:00 am to 5:00 Monday through Sunday

HVAC System Types:

> **Heating Source:** Air handling units utilize electric strip heat provide heating to the buildings.
>
> **Cooling Source:** Spit system units utilize direct expansion to provide cooling to the buildings.
>
> **Air Handling Units:** Air handling units serve each building.
>
> **HVAC System Controls:** Programmable thermostats are utilized to control the equipment in the building.

DX Condenser / Compressor Summary

Manufacturer	Model	Tons	Compressor					Condenser Fans				Manf. Date
			#	Volts	Amps	Phase	Refrigerant	#	Volts	Amps	Phase	
Guardian	GAW14L36C21SA	3	1	208/230	14.1	1	407C	1	208/230	1.3	1	
Ruud	UAHE036JAS	3	1	208/230	15.5	1	22	1	208/230	1.3	1	1991
American Std	2TTR3060	2.5	1	208/230	25	1	22	1	208/230	1.3	1	2007
Rheem	TZAA3362A757	3	1	208/230	15.4	1	22	1	208/230	0.8	1	2013
Fujitsu	AOU36CLX1	3	1	208/230	15.3	1		1	208/230	0.9	1	
Fujitsu	AOU24RLXFZ	2	1	208/230	12	1		1	208/230	0.5	1	

Hollywood North Beach Park
3601 N. Ocean DR., Hollywood, FL 33019

Area: 4,000 sf

Year Built: 1988

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Asphalt shingle

Window Type: Single pane with metal frames and tint.

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:
November 5, 2017 through March 10, 2018 — 8 am to 6 pm
March 11, 2018 through November 3, 2018 — 8 am to 7:30 pm

HVAC System Types:

Heating Source: Air Handling units utilize electric heat to provide heating to the building.

Cooling Source: Air Handling units utilize direct expansion units to provide cooling to the building.

Air Handling Units: Air-handling units (split system) serve Gate House.

HVAC System Controls: Electronic thermostats are utilized to control the equipment with in the buildings.

Hollywood North Beach Park
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Make	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				HP	Volts	Amps	Ph	Type	Type		Served
AHU-1	Ruud	RCFA-A-24	N/A	0.33	208/230	1.6	1	DX		2009	Gatehouse

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New	Compressor					Condenser Fans					Manf.
						EER/SEER	#	Volts	Amps	Ph	Refrig.	#	HP	Volts	Amps	Ph	Date
CU-1	AHU-1	Ruud	13AJA24A01	7653N330908693	2	11.2	1	208/230	10.4	1	R-22	1	1/10	208/230	0.6	1	2009

African American Library
2650 NW 6th ST., Ft. Lauderdale, FL 33311

Area: 61,150 sf

Year Built: 2003

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:
10:00 am to 6:00 pm; Tuesday, Thursday thru Sunday
12:00 pm to 8:00 pm; Monday, Wednesday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in either the air handling units, mounted in the ductwork, or located inside the terminal units.

Cooling Source: The majority of cooling is provided by a 243 ton air-cooled chiller located across the parking lot from the library. Additionally, the Exhibit Hall (AHU-5) and Archives (AHU-9) have supplemental split systems which utilize direct expansion to provide cooling for those areas. These are critical areas in which the County desired a back-up cooling system in the event that the primary chilled water system was to fail.

Air Handling Units: Conditioned air is distributed throughout the building by nine chilled water air handling units (AHUs), three chilled water fan coil units, and two back-up split systems. Of the eleven air handling units, four of them are Variable Air Volume (VAV) and the remaining seven AHUs are constant volume, single zone systems.

HVAC System Controls: The building utilizes a Johnson Controls Metasys Building Automation System (BAS) that was installed when the building was constructed. The BAS is not utilized to its full potential as much of the HVAC equipment is not scheduled appropriately.

Tables on the following pages detail the HVAC equipment for this facility.

OPTERRA
An ENGIE company

African American Library
HVAC Equipment Inventory

Chiller Summary Table

Serial	Building	Tag	Manufacturer	Model	Type	Nominal	Compressor					Condenser Fans				
						Tons	#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
RMKM001818	African American Library	CH-1	York	YCAS0250EC46XFASB	Air-Cooled	243	3	460	128	3	R-22	12		460	4	3

Note: County To Replace Chiller

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type		Served
AHU-1	York	AP-80	CLKM08231D	2.74	5.00	460	6.6	3	CHW	Primary Heat	2001	Stage
AHU-2	York	AP-215	CLKM08232D	3.59	15.0	460	19.3	3	CHW	Primary Heat & Zone Heat	2001	Auditorium
AHU-3	York	AP-215	CLKM08234D	3.65	15.0	460	19.3	3	CHW	Primary Heat	2001	Seminar
AHU-4	York	AP-215	CLKM08235D	3.55	15.0	460	19.3	3	CHW	Primary Heat	2001	Lobby
AHU-5	York	AP-215	CLKM08236D	3.72	15.0	460	19.3	3	CHW	Primary Heat	2001	Exhibit
AHU-5A	Carrier	40RUAA12A2A6A0A0A0	1513U14087		2.4	208	6.7	3	DX	7.5 kW EDH	2013	Exhibit (Backup)
AHU-6	York	AP-80	CLKM08237D	2.67	7.5	460	10.8	3	CHW	Zone Heat	2001	Dress Rm
AHU-7	York	AP-105	CLKM08239D	3.38	7.5	460	9.7	3	CHW	Zone Heat	2001	Youth Service
AHU-8	York	AP-360	CLKM08241D	4.56	30.0	460	36.6	3	CHW	Primary Heat & Zone Heat	2001	Gen. Coll.
AHU-9	York	AP-105	CLKM08240D	4.1	10.00	460	13.4	3	CHW	Primary Heat	2001	SP. Collect
AHU-9A	Carrier	40RUAA12A2A6A0A0A0	2413U23671		2.4	208	6.7	3	DX		2013	SP. Collect (Backup)
FC-1	Carrier	39MN10D021ZE011XKS	3413U32485						CHW		2013	
FC-2	Carrier	39MN06D021ZE111XKS	3413U32486		2.00	460	2.9	3	CHW		2013	
FC-3	Carrier	39MN08D02264L11XGS	4713U42098						CHW		2013	

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-5A	AHU-5A	Carrier	38AUZA12A0B5A0A0A0	3515C93988	10	1	208	30.1	3	R-410A	2		230	1.5	1	2015
CU-9A	AHU-9A	Carrier	38AUZA12A0B6A0A0A0	2615C92305	10	1	460	16.7	3	R-410A	2		460	0.8	1	2015

Pump Summary Data

Tag	Service	Pump Manufacturer	Pump Model	GPM	Head (ft.)	Motor Specified Data				
						RPM	HP	Volts	Amps	Phase
CHWP-1	Chilled Water Loop	Taco	FE4010	580	90	1765	25.0	460	29.5	3
CHWP-2	Chilled Water Loop	Taco	FE4010	580	90	1760	25.0	460	30	3

Note: Pump Nameplate not accessible. Data shown was the original equipment selection, per Construction Documents

Southwest Regional Library
16835 Sheridan ST., Pembroke Pines, FL 33331

Area: 79,747 sf

Year Built: 2000

Major Additions: None

Wall Type: Tilt-Up Concrete

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:
10:00 am to 6:00 pm; Thursday thru Sunday
10:00 am to 8:00 pm; Monday thru Wednesday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units.

Cooling Source: Chilled water is provided to the Southwest Regional Library by the neighboring Pembroke Pines Charter School. There is a BTU meter installed at the facility; however, it appeared to be unreliable and not data was provided to OpTerra for review.

Air Handling Units: Conditioned air is distributed throughout the building by five chilled water air handling units (AHUs) and three chilled water fan coil unit. All five primary AHUs are Variable Air Volume (VAV).

HVAC System Controls: The building utilizes a Trane Building Automation System (BAS) with a Niagara AX Graphical User Interface that was installed when the building was constructed. All five AHUs had reasonable schedules assigned to them.

Electric Note: In addition to chilled water, the Southwest Regional Library also receives electric utility from the Charter School. There is a sub-meter installed in the library; however, no consumption or expenditure data was provided to OpTerra.

Tables on the following pages detail the HVAC equipment for this facility.

Southwest Regional Library
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type		Served
AHU-R1	Trane	MCCA035UB0A00000U	K99L01249O	4.1	20.00	460	24.8	3	CHW	VAV EDH	1999	1st FL West
AHU-R2	Trane	MCCA017JBG0C0B000A	K99L01256O	3.6	10.0	460	13.4	3	CHW	VAV EDH	1999	1st FL East
AHU-R3	Trane	MCCA010GAX0BB0C00F0ECA00	K99L01263O	3.4	7.50	460	9.7	3	CHW	VAV EDH	1999	1st FL Multi-Purpose Rm
AHU-R4	Trane	MCCA035JBG0C0B000A	K99L01266O	4.4	25.00	460	30.3	3	CHW	VAV EDH	1999	2nd FL West
AHU-R5	Trane	MCCA035JBG0C0B000A	K99L01271O	3.9	15.00	460	18.9	3	CHW	VAV EDH	1999	2nd FL East
FCU-R1	Trane	SCCB-080		0.4	320w	115		1	CHW	N/A	1999	1st FL Telcom Rm
FCU-R2	Trane	SCCB-080		0.4	320w	115		1	CHW	N/A	1999	1st FL Server Rm
FCU-R3	Trane	SCCB-080		0.4	320w	115		1	CHW	N/A	1999	2nd FL Telcom Rm

West Regional Library
100 North Pine Island RD., Plantation, FL 33324

Area: 72,000 sf

Year Built: 2005

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:
10:00 am to 6:00 pm; Thursday thru Sunday
10:00 am to 8:00 pm; Monday thru Wednesday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units.

Cooling Source: The majority of cooling is provided by two 132 ton water-cooled chillers that are located in a ground floor mechanical room. Additionally, there are two small mini-split systems which utilize direct expansion to provide cooling for data closets.

Air Handling Units: Conditioned air is distributed throughout the building by six chilled water air handling units (AHUs) and one chilled water fan coil unit. AHU-6 also includes an outside air pretreatment unit that utilizes a chilled water coil to pre-cool ventilation. All six primary AHUs and the pretreatment unit are Variable Air Volume (VAV).

HVAC System Controls: The building utilizes a Johnson Controls Metasys Building Automation System (BAS) that was installed when the building was constructed. Many of the HVAC systems did have schedules assigned in the BAS; however, they were not optimized to minimize annual energy consumption.

Tables on the following pages detail the HVAC equipment for this facility.

West Regional Library
HVAC Equipment Inventory

Chiller Summary Table

Serial	Building	Tag	Manufacturer	Model	Type	Nominal	Compressor					Condenser Fans				
						Tons	#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
U05L05112	West Regional Library	CH-1	Trane	RTHB130MG00LWP000UNN 3LF2LF000U0	Water-Cooled	132	1	460	129	3	R-22	Not Applicable				
U05L05114	West Regional Library	CH-2	Trane	RTHB130MG00LWP000UNN 3LF2LF000U0	Water-Cooled	132	1	460	129	3	R-22	Not Applicable				

Cooling Tower Summary Table

Building	Tag	Manufacturer	Model	Serial	Motor			
					HP	Volts	Amps	Phase
West Regional Library	CT-1	Marley	21221	C-248950-A2 NC8301EL2CS-04	10	460		3
West Regional Library	CT-2	Marley	21221		10	460		3

Pump Summary Data

Tag	Service	Pump Manufacturer	Pump Model	Design Conditions		Motor Specified Data				
				GPM	Head (ft.)	RPM	HP	Volts	Amps	Phase
CHWP-1	Chilled Water	Bell & Gossett	1510 BF 10.625 4E	640	90	1770	20.0	460	25.6	3
CHWP-2	Chilled Water	Bell & Gossett	1510 BF 10.625 4E	640	90	1770	20.0	460	25.6	3
CWP-1	Condenser Water	Bell & Gossett	1510 BF 7.875 3BC	400	50	1760	7.5	460	9.8	3
CWP-2	Condenser Water	Bell & Gossett	1510 BF 7.875 3BC	400	50	1760	7.5	460	9.8	3
CWP-3	Condenser Water	Bell & Gossett	1510 BF 7.875 3BC	400	50	1760	7.5	460	9.8	3

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type	
AHU-1	Trane	MCCB030UA0C0UA	K05I38489a	2	20.00	460	24.8	3	CHW	None	2005
AHU-2	Trane	MCCB025UA0C0UB	K05L38496A	2	10.0	460	12.5	3	CHW	None	2005
AHU-3	Trane		K05L38503A	2	15.00	460	19	3	CHW	None	2005
AHU-4	Trane	MCCB021UA0C0UA	K05L38510A	2	10.00	460	11.9	3	CHW	None	2005
AHU-5	Trane	MCCB017UA0C0UA	K05L38518A	2	10.00	460	13.3	3	CHW	None	2005
AHU-6	Trane	MCCB008UA0C0UB	K05L38525A	1.5	5.00	460	6.4	3	CHW	30 kW EDH	2005
AHU-6-OA	Trane	MCCB0060UB	K05L38537A	No Fan					CHW	None	2005
FCU-1	Trane			0	0.20	277		1			2005
MS-1	Diaken	FTXN09KEYJUS		0	0.20	208	0.18	1	DX	None	2014
MS-2	Diaken	FTXN09KEYJUS		0	0.20	208	0.18	1	DX	None	2014

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1	MS-1	Diaken	RKN09KEVJU5	G000627	0.75	1	208	3.3	1	R-410A	1	33 Watts	208	0.17	1	2013
CU-2	MS-2	Diaken	RKN09KEVJU5	G001020	0.75	1	208	3.3	1	R-410A	1	33 Watts	208	0.17	1	2013

Ventilation Fan Schedule

Tag	Fan Manufacturer	Fan Model	Serial	Design Criteria			Motor				Manf. Date	Area	Control Type
				Type	SP (in wc)	CFM	HP/Watts	Volts	Amps	Phase		Served	
OAF-1	Greenheck	BSQ-180-10		Outside Air	0.125	4400	1.00	277		1	2005	AHU-1	Interlock w/AHU-1
OAF-2	Greenheck	BSQ-140-5		Outside Air	0.125	2450	0.5	277		1	2005	AHU-2	Interlock w/AHU-2
OAF-3	Greenheck	BSQ-160-5		Outside Air	0.125	3050	0.50	277		1	2005	AHU-3	Interlock w/AHU-3
OAF-4	Greenheck	BSQ-140-5		Outside Air	0.125	2400	0.50	277		1	2005	AHU-4	Interlock w/AHU-4
OAF-5	Greenheck	BSQ-140-7		Outside Air	0.125	2700	0.75	277		1	2005	AHU-5	Interlock w/AHU-5
OAF-6	Greenheck	BSQ-130-7		Outside Air	0.5	2000	0.75	277		1	2005	AHU-6	Interlock w/AHU-6
EF-1	Greenheck	CSP-A710		Exhaust	0.25	450	325 watts	277		1	2005	Toilet	Interlock w/AHU-2
EF-2	Greenheck	CSP-A710		Exhaust	0.25	450	325 watts	277		1	2005	Toilet	Interlock w/AHU-2
EF-3	Greenheck	SP-A190		Exhaust	0.25	100	113 watts	277		1	2005	Toilet	Interlock w/AHU-2
EF-4	Greenheck	SP-A190		Exhaust	0.25	100	113 watts	277		1	2005	Toilet	Interlock w/AHU-2
EF-5	Greenheck	SP-A190		Exhaust	0.25	100	113 watts	277		1	2005	Toilet	Interlock w/AHU-2
EF-6	Greenheck	CSP-A780		Exhaust	0.25	600	405 watts	277		1	2005	Toilet	Interlock w/AHU-1
EF-7	Greenheck	SP-A710		Exhaust	0.25	400	285 watts	277		1	2005	Electrical Rm	Thermostat
EF-8	Greenheck	CSP-A780		Exhaust	0.125	600	405 watts	277		1	2005	Toilet	Interlock w/AHU-3
EF-9	Greenheck	SP-A110		Exhaust	0.125	100	49 watts	277		1	2005	Toilet	Interlock w/AHU-4
EF-10	Greenheck	SP-A110		Exhaust	0.125	100	49 watts	277		1	2005	Toilet	Interlock w/AHU-4
EF-11	Greenheck	SP-A390		Exhaust	0.125	300	135 watts	277		1	2005	Electrical Rm	Thermostat
EF-12	Greenheck	BSQ-130-10		Exhaust	0.125	2500	1.00	277		1	2005	Mechanical Rm	Refr. Monitor

Northwest Regional Library
3151 University DR., Coral Springs, FL 33071

Area: 72,000 sf

Year Built: Tenant Build-Out in 2000
(Original Building Age Unknown)

Major Additions: None

Wall Type: Tilt-Up Concrete

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:
10:00 am to 6:00 pm; Thursday thru Sunday
10:00 am to 8:00 pm; Monday thru Wednesday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units.

Cooling Source: The majority of cooling is provided by two 100 ton air-cooled chillers that are located on the first floor roof. Additionally, there are two small split systems which utilize direct expansion to provide cooling for data closets.

Air Handling Units: Conditioned air is distributed throughout the building by five chilled water air handling units (AHUs) and two direct expansion fan coil units. Of the five primary air handling units, two of them are Variable Air Volume (VAV) and the remaining three AHUs are constant volume.

HVAC System Controls: The building utilizes a Johnson Controls Metasys Building Automation System (BAS) that was installed when the building was constructed. Many of the HVAC systems did have schedules assigned in the BAS; however, they were not optimized to minimize annual energy consumption.

Tables on the following pages detail the HVAC equipment for this facility.

Northwest Regional Library

HVAC Equipment Inventory

Chiller Summary Table

Serial	Building	Tag	Manufacturer	Model	Type	Nominal	Compressor					Condenser Fans				
						Tons	#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
U00D08427	NW Regional Library	ECH-1	Trane	RTAA1004XL01A3D0BF0	Air-Cooled	100	2	460	84	3	R-22	10	1	460	3	3
U00D08426	NW Regional Library	ECH-2	Trane	RTAA1004XL01A3D0BF0	Air-Cooled	100	2	460	84	3	R-22	10	1	460	3	3

Pump Summary Data

Tag	Service	Pump Manufacturer	Pump Model	Design Conditions		Motor Specified Data				
				GPM	Head (ft.)	RPM	HP	Volts	Amps	Phase
CWP-1	Chilled Water	No Access/Insulated		240	85	1770	10.0	460	13.5	3
CWP-2	Chilled Water	No Access/Insulated		240	85	1770	10.0	460	13.5	3

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type		Served
AHU-1	Trane	MCCA050UB000A000U	K00C47310	3	25.00	460	30.5	3	CHW	N/A	2000	Library - First Floor
AHU-2	Trane	MCCA006HBE0C0A0S00000	K00C47315	1.5	2.0	460	2.8	3	CHW	N/A	2000	Receiving - First Floor
AHU-3	Trane	MCCA012HBE0C0B0S00000	K00C47319	1.5	7.50	460	9.7	3	CHW	N/A	2000	Multi-Purpose Room
AHU-4	Trane		K00C48423	3	30.00	460	34	3	CHW	N/A	2000	Library - Second Floor
AHU-5	Trane	MCC-08 Series		1.5	5.00	460		3	CHW	N/A	2000	Staff/Quiet - First Floor
AC-1	Trane	TWE-030P13	N/A	0.25	0.33	208		1	CHW	N/A	2000	Comm Rm - First Floor
AC-2	Trane	TWE-024P13	N/A	0.25	0.25	208		1	CHW	N/A	2000	Comm Rm - Second Floo

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
ACCU-1	AC-1	Trane	TTP030D100A0	R223XSJ3F	2.5	1	208	13	1	R-22	1	1/5	208	1.5	1	2000
ACCU-2	AC-2	Trane	TTP024C100A3	R204NXG2F	2	1	208	11	1	R-22	1	1/12	208	0.5	1	2000

Weston Library
4205 Bonaventure BLVD., Weston, FL 33332

Area: 51,000 sf

Year Built: 2005

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

Library (1st Floor)
10:00 am to 6:00 pm; Thursday thru Saturday
10:00 am to 8:00 pm; Monday thru Wednesday
Closed; Sunday

Broward College (2nd Floor)
7:00 am to 10:00 pm; Monday thru Friday
Closed; Saturday thru Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units.

Cooling Source: The majority of cooling is provided by a 170 ton air-cooled chiller that is located on the North side of the building. Additionally, there are three small split systems which utilize direct expansion to provide cooling for data closets.

Air Handling Units: Conditioned air is distributed throughout the building by three chilled water air handling units (AHUs) and three direct expansion fan coil units. Two AHUs are ducted in parallel and combine for a single medium pressure supply duct that serves the first floor. The third AHU is located on the second floor. All three of the primary air handling units are Variable Air Volume (VAV).

HVAC System Controls: The building utilizes a Johnson Controls Metasys Building Automation System (BAS) that was installed when the building was constructed. Many of the HVAC systems did have schedules assigned in the BAS; however, the schedules have the HVAC units operating far longer hours than necessary.

Tables on the following pages detail the HVAC equipment for this facility.

Weston Library
HVAC Equipment Inventory

Chiller Summary Table

Serial	Building	Tag	Manufacturer	Model	Type	Year Mfg	Nominal Tons	Compressor					Condenser Fans				
								#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
STNU05040007 2	Weston Library	CH-1	McQuay	ALS186C27-ER11	Air-Cooled	2005	170	1	460	129	3	R-22	12	2	460	3	3
								1	460	158							

Pump Summary Data

Tag	Service	Pump Manufacturer	Pump Model	GPM	Head (ft.)	Motor Specified Data				
						RPM	HP	Volts	Amps	Phase
P-1	CHW	Taco	KV4009	410	60	1725	10.0	460	14	3
P-2	CHW	Taco	KV4009	410	60	1725	10.0	460	14	3

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial Number		Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type		
AHU-1	McQuay	CAH035FDAC	FBOU050300574		20.0	460	23.5	3	CHW	Electric VAV	2005	1st Floor
AHU-2	McQuay	CAH035FDAC	FBOU050300573		20.0	460	23.5	3	CHW	Electric VAV	2005	1st Floor
AHU-3	McQuay	CAH040FDAC	FBOU050300582		25.00				CHW	Electric VAV	2005	2nd Floor
AC-1	Rheem	No Access										1st Floor Telecom Rm
AC-2	Fujitsu	ASU9CQ	BCA003534			115	0.23	1	DX	N/A	2005	Book Return
AC-3	Rheem	No Access										2nd Floor Telecom Rm

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
ACCU-1	AC-1	Rheem	13AJA18A01	7652W480907582	1.5	1	230	7.7	1	R-22	1	1/6	230	1	1	2009
ACCU-2	AC-2	Fujitsu	AOU9CQ	BCN011490	0.75	1	115	7	1	R-410A	1		115	0.2	1	2005
ACCU-3	AC-3	Rheem	13AJA18A01	7652W460903008	1.5	1	230	7.7	1	R-22	1	1/6	230	1	1	2009

Lauderdale Lakes Library

3580 W Oakland Park BLVD., Lauderdale Lakes, FL 33311

Area: 20,237 sf

Year Built: 2008

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Pitched w/Barrel Tile

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

Library (1st Floor)
10:00 am to 6:00 pm; Monday, Wednesday, Saturday, Sunday
12:00 pm to 8:00 pm; Tuesday, Thursday
Closed; Sunday

City of Lauderdale Lakes Civic Area (2nd Floor)
8:00 am to 10:00 pm; Monday thru Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units. Reheat is provided by a heat exchanger that captures waste heat from the air-cooled chiller.

Cooling Source: Cooling is provided by a 100 ton air-cooled chiller that is located on the West side of the building.

Air Handling Units: Conditioned air is distributed throughout the building by two chilled water air handling units (AHUs), one per floor. Both air handling units are Variable Air Volume (VAV).

HVAC System Controls: The building utilizes a Johnson Controls Metasys Building Automation System (BAS) that was installed when the building was constructed. Many of the HVAC systems did have schedules assigned in the BAS; however, they were not optimized to minimize annual energy consumption.

Tables on the following pages detail the HVAC equipment for this facility.

OPTERRA
An ENGIE company

Lauderdale Lakes Library
HVAC Equipment Inventory

Chiller Summary Table

Serial	Building	Tag	Manufacturer	Model	Type	Year Mfg	Nominal Tons	Compressor					Condenser Fans				
								#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
2MTM000370	Lauderdale Lakes Library	CH-1	York	YCAL0104EB46XCBDBTX	Air-Cooled	2008	100	3	460	30.6	3	R-407C	3		460	4	3
								2	460	38.5	3	R-407C	3		460	4	3

Pump Summary Data

Tag	Service	Pump Manufacturer	Pump Model	GPM	Head (ft.)	Motor Specified Data				
						RPM	HP	Volts	Amps	Phase
CHWP-1	CH-1	Taco	KS3007AL2JCA28911	185		1725	3.0	208-230/460	9-8.6/4.3	3
CHWP-2	CH-1	Taco	KS3007AL2JCA28911	185		1725	3.0	208-230/460	9-8.6/4.3	3
HWP-1	Heat Recovery	No Access								
HWP-2	Heat Recovery	No Access								

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial Number		Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type		Served
AHU-1	York	XTI-063X069-FALA046A	CNTMXT0120		15.00	460	20.3	3	CH	N/A	2008	1st FL
AHU-2	York	XTI-063X090-FAMA046A	CNTMXT0121		20.0	460	25	3	CH	N/A	2008	2nd FL multipurpose

Stirling Road Library
3151 Stirling RD., Hollywood, FL 33312

Area: 20,000 sf

Year Built: 2000

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Friday thru Monday
12:00 pm to 8:00 pm; Tuesday, Thursday
Closed; Wednesday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units.

Cooling Source: Cooling is provided by a large split system utilizing an 88 ton air-cooled condensing unit which had been replaced in 2010.

Air Handling Units: Conditioned air is distributed throughout the building by a single Variable Air Volume Air Handling Unit.

HVAC System Controls: The building utilizes an old KMC Building Automation System (BAS) that was installed when the building was constructed. This BAS still utilizes a dial-up modem for Facilities Maintenance Division to access remotely. There were many issues observed with the current BAS. In addition, due to limited control, the HVAC currently operates 24/7 without night or weekend temperature setbacks.

Tables on the following pages detail the HVAC equipment for this facility.

Stirling Road Library
HVAC Equipment Inventory

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New	Compressor					Condenser Fans					Manf. Date
						EER/SEER	#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1	AHU-1	York	YLUA0078ZE46XBASD…	2MWM008854	88	11.7	6	460	23.1	3	R-410A	4		460	4	3	2010

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type		Served
AHU-1	York	SC-RF-MB	CLLM14010D	7.37	40.00	460	47	3	DX	N/A	2000	Entire Library

North Lauderdale Library
6901 Kimberly Blvd, North Lauderdale, FL 33068

Area: 20,000 sf

Year Built: 2004

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilized many different lighting technologies including LED, Compact Fluorescent, Linear Fluorescent, HID, Halogen, etc. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Wednesday thru Saturday
12:00 pm to 8:00 pm; Monday, Tuesday
Closed; Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units.

Cooling Source: Cooling is provided by a large split system utilizing two air-cooled condensing unit. A 50 ton condensing unit is coupled to a pre-cooling evaporator coil located in the pre-cooling section of AHU-1. A 40 ton condensing unit is coupled to a primary cooling evaporator coil also located in AHU-1.

Air Handling Units: Conditioned air is distributed throughout the building by a single Variable Air Volume Air Handling Unit.

HVAC System Controls: The building utilizes a newer Johnson Control Metasys Building Automation System (BAS). The BAS was found to be in very good condition with appropriate schedules assigned to HVAC equipment.

Tables on the following pages detail the HVAC equipment for this facility.

North Lauderdale Library
HVAC Equipment Inventory

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1	AHU-1	Trane	RAUCC504B		40	4	460	18.1	3	R-22	4	1	460	1.8	3	2008
CU-2	O/A Pre-cool	Trane	RAUCC404B		50	2	460	26.3	3	R-22	6	1	460	1.8	3	2008

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type	
AHU-1	Trane	MCCB050UA0C0UA	H4A243B						DX	VAV EDH	2003

Sunrise (Dan Pearl) Library
10500 W Oakland Park Blvd., Sunrise, FL 33351

Area: 19,500 sf

Year Built: 1995

Major Additions: None

Wall Type: CMU w/Stucco

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilizes a significant amount of HID lighting both in interior and exterior fixtures. Additionally, it utilized compact fluorescents, linear fluorescents, and halogen lighting technologies. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Monday, Thursday thru Saturday
12:00 pm to 8:00 pm; Tuesday, Wednesday
Closed; Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units.

Cooling Source: Cooling is provided by two split systems utilizing air-cooled condensing units. The larger splits system, a 40-ton units had two condensing units coupled with a dual circuit evaporator coil. A smaller 10-ton split system serves the multi-purpose room.

Air Handling Units: Conditioned air is distributed to the majority of the main library by a large Variable Air Volume Air Handling Unit. A smaller air handling unit provides conditioned air to the multi-purpose room.

HVAC System Controls: The building utilizes Siemens Apogee BAS. The system was found to be in fair condition; however, both Air Handling Units were found to operate 24/7 without any night or weekend set back.

Tables on the following pages detail the HVAC equipment for this facility.

Sunrise (Dan Pearl) Library
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type	
AC-1	Trane	MCCA040DEE0BB000A….	K93G50558		20.00				DX	EDH	1993
AC-2	Trane	MCCA006GAE0BAB000D…	K93H56388						DX	EDH	1993

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1A	AHU-1	Trane	RAUCC20EBX030BD000009	C02K09076	20	2	200	41.4	3	R-22	2	1	200	4.1	3	2002
CU-1B	AHU-1	Trane	RAUCC20EBX030BD000010	C03J08036	20	2	200	41.4	3	R-22	2	1	200	4.1	3	2003
CU-2	AHU-2	Trane	TTA120B300EA	4075TBPAD	10	2	208	20.7	3	R-22	1		230	6	1	2004

Margate Library

5810 Park DR., Margate, FL 33063

Area: 15,800 sf

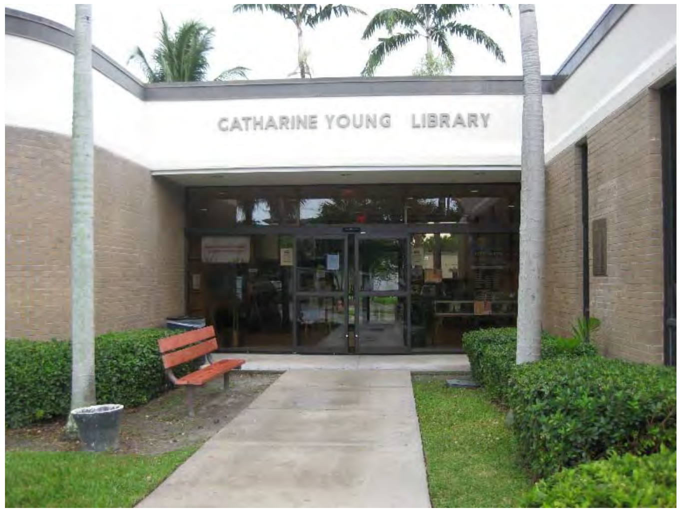
Year Built: 1978

Major Additions: 2004 (Renovation)

Wall Type: CMU w/Brick Façade

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint



Lighting Type: This facility utilizes a variety of lighting technologies; including compact fluorescents, linear fluorescents, halogen, and HID lighting. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Monday, Wednesday, Friday, Saturday
12:00 pm to 8:00 pm; Tuesday, Thursday
Closed; Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the terminal units.

Cooling Source: Cooling is provided by a 50-ton air-cooled chiller located behind the library that serves the entire library. A small condensing unit, also located behind the library, provides cooling for a min-split system.

Air Handling Units: Conditioned air is distributed to the majority of the main library by a larger Variable Air Volume Air Handling Unit. A smaller air handling unit provides conditioned air to the multi-purpose room. A small direct expansion fan coil unit provides cooling for a data closet.

HVAC System Controls: The building utilizes Siemens Apogee BAS. The system was found to be in fair condition; however, both Air Handling Units were found to operate 24/7 without any night or weekend set back.

Tables on the following pages detail the HVAC equipment for this facility.

Margate Library
HVAC Equipment Inventory

Chiller Summary Table

Serial	Building	Tag	Manufacturer	Model	Type	Year Mfg	Nominal Tons	Compressor					Condenser Fans				
								#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
2304F38848	Margate	CH-1	Carrier	30RAN050K-E511AL	Air-Cooled	2004	50	4	208/230	40.8	3	R-22	4	1.5	208/230	5.3	3
													2	4.2	208/230	13.9	3

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial Number		Motor				Cooling Coil	Heating Coil	Manf. Date
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type	
FCU-1	Carrier	40MFC009--101--	0215V00038		0.02	115	0.3	1	DX	N/A	2015
AHU-1	Carrier	39MCSTD01LCBXXXBHH	2404F40210						CHW	Electric	2004
AHU-2	Carrier	39MN08B0054M611SXS	2404F40169						CHW	Electric	2004

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1	FCU-1	Carrier	38MFc009---1	3914V07893	0.75	1	115	5.3	1	R410A	1	0.31	115	0.7	1	2014

Hallandale Library
300 South Federal Highway, Hallandale, FL 33009

Area: 14,700 sf

Year Built: 1980

Major Additions: None

Wall Type: CMU w/Stucco

Roof Type: Built-up roof

Window Type: Double pane with metal frames and tint. Several of the gaskets on the existing windows have failed, leading to fogging between the panes.

Lighting Type: This facility utilizes a variety of lighting technologies; including compact fluorescents, linear fluorescents, halogen, and HID lighting. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Wednesday thru Saturday
12:00 pm to 8:00 pm; Monday, Tuesday
Closed; Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric duct heaters that are located in the main supply ducts.

Cooling Source: Cooling is provided by four split direct expansion systems. Condensing units are all located on the back side of the library in a locked enclosure.

Air Handling Units: Conditioned air is distributed to the majority of the main library by a larger single zone, constant volume air handling unit. Three smaller air handling units provide conditioned air to the multi-purpose room, restrooms, and lobby area.

HVAC System Controls: The building utilizes standard non-programmable thermostats located in the return air duct to control space temperature. Currently, the HVAC system operate 27/7 with no night or weekend temperature setbacks.

Tables on the following pages detail the HVAC equipment for this facility.

OPTERRA
An ENGIE company

Hallandale Library

HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type		Served
AC-1	Trane	LPCAB25D1D0G5	T03M80676	2003					DX	EDH	2003	Main Library
AC-2	Rheem	RHLA-HM6024JA	M500703828	2007					DX	EDH	2007	Lobby/Restrooms/Kitchen
AC-3	Ruud	RHGE-100ZK	152F490314486	2003					DX	EDH	2003	Multi-Purpose Room (East)
AC-4	Ruud	RHGE-075ZK	139G359701330	1997					DX	EDH	1997	Multi-Purpose Room (West)

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1A	AC-1	Rheem	RAWL-180CAZ	7925F141301920	15	2	208/230	25	3	R-410A	3	1/3	208/230	2.4	3	2013
CU-1B	AC-1	Rheem	RAWL-180CAZ	F451302352	15	2	208/230	25	3	R-410A	3	1/3	208/230	2.4	3	2013
CU-2	AC-2	Rheem	RAKB-060CAZ	7011M480706842	5	1	208/230	18.6	3	R-22	1	1/3	208/230	1.5	3	2007
CU-3	AC-3	Ruud	RAWD-100CAZ	6239F060504284	10	1	208/230	37.8	3	R-22	2	1/3	208/230	2.2	1	2005
CU-4	AC-4	Rheem	RAWD-091CAZ	7335F410706647	7	1	208/230	22.4	3	R-22	1	1/3	208/230	4.2	1	2007

Century Plaza Library
1890 Hillsboro BLVD., Deerfield Beach, FL 33441

Area: 11,682 sf

Year Built: Unknown

Major Additions: Tenant Build-Out (2001)

Wall Type: CMU w/Stucco

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilizes a variety of lighting technologies; including compact fluorescents, linear fluorescents, halogen, and HID lighting. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Monday thru Saturday
Closed; Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric duct heaters that are located in the main supply ducts.

Cooling Source: Cooling is provided by four rooftop packaged units.

Air Handling Units: The single-zone packaged rooftop unit distribute conditioned air to all spaces inside the library.

HVAC System Controls: The building utilizes standard wall mounted thermostats to control space temperature. Currently, the HVAC system operate 27/7 with no night or weekend temperature setbacks.

Dania Beach Library
1 Park Avenue E., Dania, FL 33004

Area: 9,970 sf

Year Built: 2011

Major Additions: None

Wall Type: CMU w/Stucco

Roof Type: Standing Seam Metal Roof with small section of Built-up roof

Window Type: Double pane with metal frames and tint.

Lighting Type: This facility utilizes a variety of lighting technologies; including compact fluorescents, linear fluorescents, halogen, and HID lighting. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Tuesday, Wednesday, Friday, Saturday
12:00 pm to 8:00 pm; Monday, Thursday
Closed; Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heaters located in the terminal units.

Cooling Source: Cooling is provided to the library by two condensing units located on the West side of the building. These condensing units are piped to a single, dual circuit evaporator coil located in the primary Air Handling Unit. A smaller mini-split condensing unit provides cooling for a data room.

Air Handling Units: Conditioned air is distributed throughout the library by a large Variable Air Volume air handling unit.

HVAC System Controls: The building utilizes a Reliable Building Automation System that was installed during building construction in 2010. The system was found in fair condition; however, the HVAC schedules and set point should be optimized.

Tables on the following pages detail the HVAC equipment for this facility.

Dania Beach Library
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial Number		Motor				Cooling Coil	Heating Coil	Manf. Date
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type	
AHU-1	York	XTI-048X090-FAJA017A	CHWMXT0180		7.50	200	21.4	3	DX	Electric	2010
AHU-2	Mitsubishi	PKA-A18HA				208/230		1	DX	N/A	2010

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans				
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
CU-1A	AHU-1	Johnson Controls	YC150C00A2	Unknown	12.5	2	208/230	22.4	3	R-410A	2	3/4	208/230	3	1
CU-1B	AHU-1	Johnson Controls	YC150C00A2	Unknown	12.5	2	208/230	22.4	3	R-410A	2	3/4	208/230	3	1
CU-2	AHU-2	Mitsubishi													

Carver Ranches Library
4733 SW 18th ST., West Park, FL 33323

Area: 16,700 sf – Includes Library and Family Success Center

Year Built: 1980

Major Additions: 2001 Renovation

Wall Type: CMU

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint.

Lighting Type: This facility utilizes a variety of lighting technologies; including compact fluorescents, linear fluorescents, halogen, and HID lighting. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Tuesday, Thursday thru Saturday
12:00 pm to 8:00 pm; Monday, Wednesday
Closed; Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heaters located in the terminal units or in the supply ductwork.

Cooling Source: Cooling is provided to the library by two condensing units located outside of the building. These condensing units are piped to a single, dual circuit evaporator coil located in the primary Air Handling Unit. The Family Success Center which is located on the same property is cooled by four rooftop package units.

Air Handling Units: Conditioned air is distributed throughout the library by a large Variable Air Volume air handling unit. The single zone, constant volume rooftop units distribute conditioned air throughout the Family Success Center.

HVAC System Controls: The Library utilizes a Johnson Controls Metasys Building Automation System that was installed during building the renovation in 2001. The system was found in fair condition; however, the HVAC schedules and set point should be optimized. The Family Success Center utilizes standard wall-mounted thermostats to control the rooftop units.

Please note, the Family Success Center receives electric service from the Carver Ranches Library. As a result, OpTerra included this building in the Group B facility assessment.

Tables on the following pages detail the HVAC equipment for this facility.

Carver Ranches Library
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type	
AHU-1	Trane	MCCB030UA0A0UB	K05D52427	1.5	15.00				DX	EDH (Zone)	2005

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New	Compressor					Condenser Fans					Manf. Date
						EER/SEER	#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1A	AHU-1	Trane	TTA240B300FA	5222L4BAD	20	9.8	2	208	33.7	3	R-22	2		230	6	1	2005
CU-1B	AHU-1	Trane	TTA180B300FA	5204M8YAD	15	10.3	2	208	25.1	3	R-22	2		230	3.1	1	2005

Family Success Center
HVAC Equipment Inventory

Rooftop/Package Unit Nameplate Data

Tag	Manufacturer	Model	Serial	Refrigerant	Rated	Supply Fan					Compressor				Condenser Fans					Manuf Date
					Clg. Tons	Qty	HP	Volts	Amps	Phase	Qty	Volts	Amps	Phase	Qty	HP	Volts	Amps	Phase	
RTU-1	Rheem	RSNL-B036CK	7420F021005438	R-410A	3	1	1/2	230	2.4	1	1	208	10.4	3	1	1/3	230	1.3	1	2010
RTU-2	International Comfort	PAE090H000AA	G054240604	R-22	7.5	1		208	5.8	3	2	208	14	3	2		230	1.4	1	2005
RTU-3	Rheem	RSKA-A060CK	6673F040411664	R-22	5	1	3/4	230	4.4	1	1	208	18.6	3	1	1/3	230	1.7	1	2004
RTU-4	International Comfort	PAS120H00AA	G063420892	R-22	10	1		208	5.8	3	2	208	15.8	3	2		230	1.4	1	2006

Northwest Branch (Pompano) Library
1580 NW 3rd AVE., Pompano Beach 33060

Area: 10,000 sf

Year Built: 2004

Major Additions: 2001 Renovation

Wall Type: CMU w/Stucco

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint.

Lighting Type: This facility utilizes a variety of lighting technologies; including compact fluorescents, linear fluorescents, halogen, and HID lighting. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

10:00 am to 6:00 pm; Tuesday, Thursday thru Saturday
12:00 pm to 8:00 pm; Monday, Wednesday
Closed; Sunday

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heaters located in the terminal units.

Cooling Source: Cooling is provided to the library by a 35-ton air-cooled chiller located on the North side of the building.

Air Handling Units: Conditioned air is distributed throughout the library by a large Variable Air Volume air handling unit.

HVAC System Controls: The Library utilizes a Johnson Controls Metasys Building Automation System that was installed during building the renovation in 2001. The system was found in good condition; however, the HVAC schedules and set point should be optimized.

Tables on the following pages detail the HVAC equipment for this facility.

Northwest Branch Library
HVAC Equipment Inventory

Chiller Summary Table

Building	Tag	Manufacturer	Model	Type	Year Mfg	Nominal Tons	Compressor					Condenser Fans				
							#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
Pompano	CH-1	Carrier	30RAN035	Air-Cooled	2004	35	NO ACCESS TO NAMEPLATE									

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial Number		Motor				Cooling Coil	Heating Coil	Manf. Date
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type	
AHU-1	Carrier	39MCSTD01JFBXXXBGM	3904F61046		0.75	208-230/115	5.5/11	1	CHW	Electric	2004
AHU-1 -O/A	Carrier	39MN06B0055P011SXS	3904F61053								2004

Public Safety Complex
2602 West Broward BLVD., Fort Lauderdale, FL 33312

Area: 300,720 sf Total
PSB – 253,076 sf
BSO District 5 – 20,250 sf
Inventory & Evidence Bldgs – 20,704 sf
Logistics Warehouse – 6,690

Year Built: 1989

Major Additions: None

Wall Type: Pre-Cast Concrete w/Stucco

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: This facility utilizes a variety of lighting technologies; including LED, compact fluorescents, linear fluorescents, halogen, and HID lighting. A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule:

8:00 am to 6:00 pm; Monday thru Friday
Closed; Saturday-Sunday
Note: 1st Floor Records is open 24/7.

HVAC System Types:

Public Safety Building

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the VAV boxes.

Cooling Source: The cooling is provided by three 325-ton water-cooled chillers that are located in the ground floor mechanical room. The three chillers are coupled with a 3-cell cooling tower that is located on the 1st Floor roof on the North side of the building.

Air Handling Units: Conditioned air is distributed throughout the building by nineteen chilled water air handling units (AHUs). The building is generally separated into an East Tower that is 5 stories and a West Tower that is 3 Stories. There are two air handling units per floor per tower with the exception of the second floor, as there is an additional two air handling units for the kitchen and dining area. Additionally, there is a small air handling unit (AHU-19) on the 5th floor that serves a small administration office.

HVAC System Controls: The PSB utilizes an old Johnson Controls Building Automation System (DSC-8500) that was installed during original building construction. This system is obsolete and has limited local support available for any issues that may arise. This early generation DDC system provided electronic overlay and graphical user interface for pneumatic field devices/actuators, including all terminal units. As a result, the central front-end software does not have any ability to monitor or control individual HVAC zones. Additionally, very limited scheduling is being utilized resulting in excessive energy consumption for the building.

BSO District 5 Office

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the VAV boxes.

Cooling/Air Handling Units: The BSO District 5 Office is conditioned by five large rooftop units. These units were originally configured as variable volume variable temperature units; however, new controls equipment was installed to convert them to full variable air volume systems.

HVAC System Controls: The BSO District 5 Office utilizes a Johnson Controls Metasys Building Automation System that was found in fair condition; however, the HVAC schedules and set point should be optimized.

Central Supply Warehouse

Heating Source: All heating in this facility is accomplished with electric duct heaters installed in the main supply duct.

Cooling/Air Handling Units: The building is conditioned by a single split system that is coupled with two rooftop mounted condensing units (dual circuit evaporator coil).

HVAC System Controls: The split system is controlled with a standard wall mounted thermostat.

Logistics Warehouse

Heating Source: All heating in this facility is accomplished with electric duct heaters installed in the main supply duct.

Cooling/Air Handling Units: The building is conditioned by a single split system that is coupled with two rooftop mounted condensing units (dual circuit evaporator coil).

HVAC System Controls: The split system is controlled with a standard wall mounted thermostat.

Tactical Training Building

Heating Source: All heating in this facility is accomplished with electric duct heaters installed in the main supply duct.

Cooling/Air Handling Units: The building is conditioned by two split systems that are coupled with rooftop mounted condensing units. The building also utilizes two rooftop packaged units to condition the South area of the building.

HVAC System Controls: All HVAC units are controlled with standard wall mounted thermostats.

Tables on the following pages detail the HVAC equipment for this facility.

Public Safety Complex

HVAC Equipment Inventory

Chiller Summary Table

Serial	Building	Tag	Manufacturer	Model	Type	Nominal	Compressor					Condenser Fans				
						Tons	#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
YAYM 636705	Public Safety	CH-1	York	YT G3 H3 E1 - CN F	Centrifugal	325	1	480	257	3	R-11					
YAYM 626704	Public Safety	CH-2	York	YT G3 H3 E1 - CN F	Centrifugal	325	1	480	257	3	R-11					
YAYM 636706	Public Safety	CH-3	York	YT G3 H3 E1 - CN F	Centrifugal	325	1	480	257	3	R-11					

Cooling Tower Summary Table

Building	Tag	Manufacturer	Model	Motor			
				HP	Volts	Amps	Phase
Safety Building	CT-1	Marley	AV-244183-A1	20	460		3

Pump Summary Data

Tag	Service	Pump Manufacturer	Pump Model			Motor Specified Data				
				GPM	Head (ft.)	RPM	HP	Volts	Amps	Phase
CHWP-1	CH-1	Bell & Gossett	5BC	780	74	1750	25.0	460	30.3	3
CHWP-2	CH-2	Bell & Gossett	5BC	780	74	1750	25.0	460	31	3
CHWP-3	CH-3	Bell & Gossett	5BC	780	74	1750	25.0	460	31	3
CHWP-4		Bay empty								
CWP-1	CTs	Bell & Gossett	1510 5BC	975	60	1750	20.0	460	24	3
CWP-2	CTs	Bell & Gossett	1510 5BC	975	60	1750	20.0	460	24.8	3
CWP-3	CTs	Bell & Gossett	1510 5BC	975	60	1750	20.0	460	24.8	3
CWP-4	CTs	Bell & Gossett	1510 5BC	975	60	1750	20.0	460	N/A	3

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
Cooler		Kolpak	PR199MOP	410016315		1	230	10.9	1	R-404A	1	1/6	230	1.1	1	2010
Freezer		Kolpak	PR249LOP	410016297		1	230	16.7	1	R-404A	1	1/6	230	1.1	1	2010
CACU-9		Liebert	DCDF308-A	1146C39012		Not Applicable					1	3/4	460	2.5	1	2011
											2	3/4	460	1.7	3	
CACU-10		Liebert				Not Applicable										2011
CACU-1		Liebert	DCDF308-A	0840C15878		Not Applicable					1	3/4	460	2.5	1	2008
											2	3/4	460	1.7	3	
CACU-2		Liebert	DCDF308-A	0840C15871		Not Applicable					1	3/4	460	2.5	1	2008
											2	3/4	460	1.7	3	
CACU-3		Liebert	DCDF308-A	0840C15876		Not Applicable					1	3/4	460	2.5	1	2008
											2	3/4	460	1.7	3	
CACU-4		Liebert	DCDF251-A	1139C37982		Not Applicable					1	3/4	460	2.5	1	2011
											2	3/4	460	1.7	3	
CACU-5		Liebert	DCDF165-A	1139C37972		Not Applicable					1	3/4	460	2.5	1	2011
											1	3/4	460	1.7	3	
CACU-6		Liebert	DCDF165-A	1139C37969		Not Applicable					1	3/4	460	2.5	1	2011
											1	3/4	460	1.7	3	
CACU-7		Liebert	DCDF104-A	1139C38002		Not Applicable					1	3/4	460	2.5	1	2011
CACU-8		Liebert	DCDF205-A	1139C38097		Not Applicable					1	3/4	460	2.5	1	2011
											1	3/4	460	1.7	3	
CU-1	Logistics Warehouse	Thermal Zone	TZAA-090DA757	8560W091323577	7.5	1	460	10.9	3	R-22	1	1/3	460	1.3	3	2013
CU-2	Logistics Warehouse	Thermal Zone	TZAA-090DA757	8560W091323559	7.5	1	460	10.9	3	R-22	1	1/3	460	1.3	3	2013
CU-1	Tactical Training Bldg	Thermal Zone	TZAA-090DA757	8560F2112006604	7.5	1	460	10.9	3	R-22	1	1/3	460	1.3	3	2012
CU-2	Tactical Training Bldg		Unknown	Unknown						R-22						
CU-1.1	Central Supply	Carrier	38AKS016-K621	3208G10053	15	1	460	29.3	3	R-22	2	0.75	460	2.1	1	2008
CU-1.2	Central Supply	Carrier	38AKS016-K621	2608G40091	15	1	460	29.3	3	R-22	2	0.75	460	2.1	1	2008

Rooftop/Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Supply Fan					Compressor					Condenser Fans					Manuf Date
					Qty	HP	Volts	Amps	Phase	Qty	Volts	Amps	Phase	Refrig.	Qty	HP	Volts	Amps	Phase	
PSB	Trane	TCD150D400BA	420100913D	12.5	1	3	460	4.8	3	2	460	10.8	3	R-22	2	0.5	460	1.5	3	2004
PSB	Trane	TSC060A1B0A002L		5										R-22						2007
PSB	Trane	TSC036A4E0A002	740101463U	3										R-22						2007
PSB	Carrier	50TM-005--V601--	4307G40220	4	1		460	1.8	1	1	460	8.3	3	R-22	1		460	0.8	1	
Tactical Training	Carrier	50HJ-014-HV651--	2309G50375	12.5	1		460	7.4	3	2	460	9	3	R-22	2		460	0.7	1	2009
Tactical Training	Carrier	50HJ-014-HV651--	2309G50378	12.5	1		460	7.4	3	2	460	9	3	R-22	2		460	0.7	1	2009
BSO - RTU-1	Daiken	MPS01FE4DV3YYYY	FBOU131101156		1	5	460	6.6	3	2	460	12.65	3	R-410A	2	1	460	2	3	2013
BSO - RTU-2	Carrier	50TC-D12A2B6A0A0A0	2013G30084		1		460	5.3	3	2	460	7.7	3	R-410A	2		460	0.8	1	2013
BSO - RTU-3	Daiken	MPS026GE4DV3YYYY	FBOU131101153		1	7.5	460	9.7	3	3	460	12.2	3	R-410A	3	1	460	2	3	2013
BSO - RTU-4	Trane	THD210G4R0A03	153210945D	17.5	1	5	460	7.6	3	2	460	13.15	3	R410A	2	1	460	2.9	1	2015
BSO - RTU-5	Trane	THD210G4R0A03	153210929D	17.5	1	5	460	7.6	3	2	460	13.15	3	R410A	2	1	460	2.9	1	2015

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Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served	Comments
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type			
AHU-1	Carrier	39EF57	0891T29940	2.9	40.00	460	47.5	3	CHW	Zone EDH	1991	1st FL West	Leaking Eco Damer, corroded actuators. Mech Rm 64F, VFD @ 50%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-2	Carrier	39EF57	0891T29943	3.7	40.00	460	47.5	3	CHW	Zone EDH	1991	1st FL West	Leaking Eco Damer, corroded actuators. Mech Rm 64F, VFD @ 34Hz, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-3	Carrier	39EF36	0891T29945	3.1	25.00	460	31.5	3	2-Way CHW	Zone EDH	1991	1st FL East	Mech Rm 63F, VFD @ 79%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-4	Carrier	39EF36	0891T29948	3.5	25.00	460	31.5	3	2-Way CHW	Zone EDH	1991	1st FL East	Mech Rm 63F, VFD @ 69%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-5	Carrier	39EF29	0891T29951	2.8	25.00	460	31.5	3	2-Way CHW	Zone EDH	1991	2nd FL East	Leaking Econo Damper, Mech Rm 63F, VFD @ 43Hz, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-6	Carrier	39EF36	0891T29953	3	25.00	460	30.3	3	2-Way CHW	Zone EDH	1991	2nd FL East	Leaking Econo Damper, Mech Rm 63F, VFD @ 38Hz, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-7	Carrier	39EF36	0891T29954	3.6	30.00	460	37	3	2-Way CHW	Zone EDH	1991	2nd FL West	Mech Rm 61F, VFD @ 74%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-8	Carrier	39ED36	0891T29937	4.4	25.00	460	31.5	3	2-Way CHW	Zone EDH	1991	2nd FL West	Mech Rm 61F, VFD @ 38Hz, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-9	Carrier	39ED13	0891T29938	2.7	10.00	460		3	CHW	Zone EDH	1991	Kitchen	Leaking Dampers, VFD
AHU-10	Carrier	39ED19	0891T29939	3	7.50	460	12.6	3	CHW	N/A	1991	Kitchen	Leaking Dampers, VFD
AHU-11	Carrier	39EF29	0891T29956	2.4	30.00	460	37	3	3-Way CHW	Zone EDH	1991	3rd FL East	Mech Rm 65F, VFD @ 48%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-12	Carrier	39EF29	0891T29957	4	20.00	460	25	3	3-Way CHW	Zone EDH	1991	3rd FL East	Mech Rm 65F, VFD @ 44%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-13	Carrier	39ED36	0891T29959	3.2	40.00	460	48	3	2-Way CHW	Zone EDH	1991	3rd FL West	Mech Rm 61F, VFD @ 41%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-14	Carrier	39ED36	0891T29960	4.3	30.00	460	37	3	2-Way CHW	Zone EDH	1991	3rd FL West	Mech Rm 61F, VFD @ 77%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-15	Carrier	39ED36	0891T29947	3.3	25.00	460	31.5	3	2-Way CHW	Zone EDH	1991	4th FL West	Leaking Dampers, Mech Rm 68F, VFD @ 69%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-16	Carrier	39EF29	0891T29962	3.4	20.00	460	25	3	2-Way CHW	Zone EDH	1991	4th FL West	Leaking Dampers, Mech Rm 68F, VFD @ 81%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-17	Carrier	39EF48	0891T29963	4	40.00	460	48	3	3-Way CHW	Zone EDH	1991	5th FL West	Mech Rm 71F, VFD @ 73%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-18	Carrier	39EF48	0891T29964	2.6	40.00	460	46	3	3-Way CHW	Zone EDH	1991	5th FL West	Mech Rm 71F, VFD @ 73%, Pneumatic Actuators (RA, Eco, CHW), Manual OA Damper, UV Filter
AHU-19				1.25		460		3	CHW	Zone EDH			

North Regional Courthouse
1600 W. Hillsboro BLVD., Deerfield Beach, FL 33442

Area: 200,000 sf

Year Built: 1995 renovation

Major Additions: None

Wall Type: Concrete element

Roof Type: New Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule: 8:00 am to 5:00 pm, Monday through Friday; staff 7:00 am to 10:00 pm, some Saturday operations.

HVAC System Types:

Heating Source: All heating in this facility is accomplished with electric strip heating that is located in the VAV boxes.

Cooling Source: The cooling is provided by three 200 100 ton water-cooled chillers that are located on the first-floor mechanical room. Additionally, there are two DX systems which utilize direct expansion to provide cooling for maintenance offices and shops.

Air Handling Units: Conditioned air is distributed throughout the building by 14 chilled water air handling units (AHUs). Of the 14 primary air handling units, five have been replaced recently and are Variable Air Volume (VAV) and the remaining AHUs are constant volume.

HVAC System Controls: The building utilizes a Johnson Controls Metasys Building Automation System (BAS) that was installed when the building was renovated. Many of the HVAC systems did have schedules assigned in the BAS; however, they were not optimized to minimize annual energy consumption.

Chiller Summary Table

Building	Tag	Manufacturer	Model	Serial	Type	Tons	Compressor				
							#	Volts	Amps	Phase	Refrigerant
NRCH	CH-1	YORK	YT B1 B2 B3 - CG E	YGXM-561834	Centrifugal	200	1	480	178	3	R-11
NRCH	CH-2	YORK	YT B1 B2 B3 - CG E	YGXM-561833	Centrifugal	200	1	480	178	3	R-11
NRCH	Ch-3	YORK	YT B1 B2 B3 - CG E	N/A	Centrifugal	200	1	480	178	3	R-11

Pump Summary Data

Tag	Service	Pump Manufacturer	Pump Model			Motor Specified Data				
				GPM	Head (ft.)	RPM	HP	Volts	Amps	Phase
CHWP-1	CH-1	TACO	No Name plate	480	120	1780	25.0	230/460	60/80	3
CHWP-2	CH-2	TACO	No Name plate	480	120	1780	25.0	230/460	60/80	3
CHWP-3	CH-3	TACO	No Name plate	480	120	1780	25	230/460	60/80	3
CWR-1	CH-1	TACO	TA1224 7 7 B2G1 A1L0	600	50	1760	10.0	230/460	25/12.5	3
CWR-2	CH-2	TACO	TA1224B2G1A2LU	600	50	1755	10.0	230/460	24.3/12.2	3
CWR-3	CH-3	TACO	TA1224 7 7 B2G1 A1L0	600	50	1760	10.0	230/460	28.4/14.2	3

Cooling Tower Summary Table

Building	Tag	Manufacturer	Model	Serial	Motor			
					HP	Volts	Amps	Phase
NRCH	CT-1	EVAPCO	USS 217-511	16-782497	10	460	12.4	3
NRCH	CT-2	EVAPCO	USS 217-511	16-782496	10	460	12.4	3

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				HP	Volts	Amps	Phase	Type	Type		Served
AHU-1	McQuay	CAH020GDAM	E020817800300	15.00	460		3	CHW	Elect. In VAV	2015	Z1 - Offices
AHU-2	McQuay	CAH049GDAM	E020817800400	30.0	460	35	3	CHW	Elect. In VAV	2015	Z2 - Clerk of Courts
AHU-3	Trane	CCDB21D50M	K90F18887	15.00	460	18.3	3	CHW	Elect. In VAV	1995	Z3 - Property Appraiser
AHU-4	Trane	CCDB14E50M	K90F18888	10.00	460	12.2	3	CHW	Elect. In VAV	1995	Z4 - Revenue Collection
AHU-5	McQuay	CAH052GDAM	E020817800500	30.00	460	35	3	CHW	Elect. In VAV	2015	Z5 - Courts
AHU-6	Trane	CCDB17HEOM	K90F19417	15.00	460	18.3	3	CHW	Elect. In VAV	1995	Z6 - 2nd floor
AHU-7	Trane	CCDB12E30OM	K90F18889	7.50	460	9.6	3	CHW	Elect. In VAV	1995	Z7 - Surplus
AHU-8	Trane	CCDB35ME0M	K90G22482	20.00	460	20	3	CHW	Elect. In VAV	1995	Z8 - Records
AHU-9	McQuay	N/A	N/A	1.00	460		3	CHW	Elect. In VAV	2015	Z9 - SE Offices
AHU-10	McQuay	CAH013GDAM	E020817800100	5.00	460		3	CHW	Elect. In VAV	2015	Z10 - Clear of Courts Storage
AHU-11	Trane	MCCA017LCD	K94H60562	5.00	460	6.3	3	CHW	N/A	1995	Z11 - Warehouse #2
AHU-12	Trane	MCCA030LCD	K96C20084	10.00	460	12.5	3	CHW	N/A	1995	Z12 - Warehouse #3
AHU-13	Trane	LPCAF08F2DOE	T04E30836	3.00	460	4.3	3	CHW	Elect. 20kW	Unk	Z13 - Storage
AC-14	Goodman				208/230		1	CHW		2002	Z14 - Maintenance shops

Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Rated Htg. Output MBH	Supply Fan					Compressor					Condenser Fans					Manuf Date
						Qty	HP	Volts	Amps	Ph	Qty	Volts	Amps	Ph	Refrig.	Qty	HP	Volts	Amps	Ph	
CU-15	American Standard	4TCC3048A3000AA	6395JUK9H	4	5 kW	1	3/4	208/230	4	1	1	208/230	14.6	3	R410A	1	1/4	208/230	1.4	1	2006

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-14	AC-14	Goodman	CLJ60-1	0206476279	5	11.0	1	208/230	25	1	R-22	1	1/4	208/230	1.8	1	2002

Government Center West
1 North University DR., Plantation, FL 33324

Area: 184,820 sf

Year Built: 1983

Major Additions: 2004 (Renovation)

Wall Type: Pre-Cast w/Stucco

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A2.

Occupancy Schedule: 8:00 am to 5:00 pm, Monday through Friday; closed, Saturday-Sunday

HVAC System Types:

> **Heating Source:** All heating in this facility is accomplished with electric strip heating that is located in the VAV boxes.
>
> **Cooling Source:** The cooling is provided by two 250-ton water-cooled chillers that are located in a rooftop penthouse mechanical room. The two chillers are coupled with a cooling tower that is also located on the rooftop.
>
> **Air Handling Units:** Conditioned air is distributed throughout the building by twelve chilled water air handling units (AHUs). The building is separated into two towers, four stories each. A-Tower is served by AHU-1 thru AHU-4 and B-Tower is served by AHU-5 thru AHU-8. The enclosed atrium is conditioned by four AHUs (AHU-9 thru AHU-12) that are located on the 2nd and 4th Floors of each Tower. Additionally, there are two rooftop package units that provide pre-conditioned outside air to the Air Handling Units.

HVAC System Controls: The building utilizes a Carrier Comfort Network Building Automation System (BAS) that was installed when the building was renovated. The BAS was in fair condition; however, it does not have many of the energy efficiency features that are available on newer BAS systems. Many of the schedules assigned to HVAC equipment were not optimized for current building occupancy.

Government Center West

HVAC Equipment Inventory

Chiller Summary Table

Serial	Building	Tag	Manufacturer	Model	Type	Nominal	Compressor						Mfg Year
						Tons	#	Volts	Amps	Phase	Refrigerant		
67925	Govt Center West	CH-1	Carrier	19XRV4041354CM864	Water-Cooled	250	1	460	346	3	R-134a		2003
511M013700	Govt Center West	CH-2	McQuay	C2612CLYY2-A	Water-Cooled	250							2011

Pump Summary Data

Tag	Service	Pump Manufacturer	Pump Model			Motor Specified Data				
				GPM	Head (ft.)	RPM	HP	Volts	Amps	Phase
CHWP-1	Chilled Water	Bell & Gossett	1510 BF 10.625	640	90	1770	25.0	460	30	3
CHWP-2	Chilled Water	Bell & Gossett	1510 BF 10.625	640	90	1770	25.0	460	30	3
CWP-1	Condenser Water	Taco	FI6013F2LAL	1133	45		20.0	460	28.5	3
CWP-2	Condenser Water	Taco	FI6013F2LAL	1133	45		20.0	460	28.5	3

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial		Motor				Cooling Coil	Heating Coil	Manf. Date	Area
				SP (in wc)	HP	Volts	Amps	Phase	Type	Type		Served
AHU-1	Carrier	39ED48	1983D09980	3					CHW	N/A	1983	1st FL A Bldg
AHU-2	Carrier	39ED48	1983D09982	3	25.0	460	31	3	CHW	N/A	1983	2nd FL A Bldg
AHU-3	Carrier	No Nameplate	No Nameplate	3	30.00	460	34.6	3	CHW	N/A	1983	3rd FL A Bldg
AHU-4	Carrier	39ED48	1983D09986	3	30.00	460	34	3	CHW	N/A	1983	4th FL A Bldg
AHU-5	Carrier	39ED39	2383T09988	3	25.00	460	28.5	3	CHW	N/A	1983	1st FL B Bldg
AHU-6	Carrier	39ED39	2383T09990	3					CHW	N/A	1983	2nd FL B Bldg
AHU-7	Carrier	39ED48	1983D09991	3	25.0	460		3	CHW	N/A	1983	3rd FL B Bldg
AHU-8	Carrier	39ED48	1983D09992	3	25.0	460	30.5	3	CHW	N/A	1983	4th FL B Bldg
AHU-9	Carrier	39MN14B0052K422CXS	0304F12221	0.64					CHW	N/A	2004	A Bldg Lobby/Atrium
AHU-10	Carrier	39M1STD01HKKCGXMG4	0304F12244	0.64					CHW	N/A	2004	A Bldg Lobby/Atrium
AHU-11	Carrier	39MN12B0052K622CXS	0304F12217						CHW	N/A	2004	B Bldg Lobby/Atrium
AHU-12	Carrier	39MN12B0052K722CXS	0304F12241						CHW	N/A	2004	B Bldg Lobby/Atrium

Rooftop Air Handling Units

Tag	Manufacturer	Model	Serial	Supply Fan					Compressor					Condenser Fans					Manuf Date
				Qty	HP	Volts	Amps	Phase	Qty	Volts	Amps	Phase	Refrig.	Qty	HP	Volts	Amps	Phase	
AHU-OA-2	Carrier	39NC26	1303V117811	1	15	460	19.3	3	Not Applicable					Not Applicable					2003
AHU-OA-1	Carrier	39NC26	1303V11780	1	15	460	19.3	3	Not Applicable					Not Applicable					2003

TRAF ENG Administration North
2300 W. Commercial BLVD., Fort Lauderdale, FL 33309

Area: 71,346 sf

Year Built: 2005

Major Additions: None

Wall Type: Architectural finish concrete block

Roof Type: Membrane

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: Traffic control operates 24/7

HVAC System Types:

Heating Source: VAV boxes utilize electric strips to provide heating to the building.

Cooling Source: (2) Air-cooled scroll chillers provide chilled water to the AHUs.

HVAC System Controls: Siemens system controls the equipment in the building.

Chiller Summary Table

Building	Tag	Manufacturer	Model	Type	Nominal Tons	Compressor					Condenser Fans				
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
All	East Chiller	York	YLAA070SE	A/C	70	3	460	24.4	3	410A	4		460	4	3
						3	460	24.4	3						
All	West Chiller	York	YLAA070SE	A/C	70	3	460	24.4	3	410A	4		460	4	3
						3	460	24.4	3						

Park Administration Complex
950 NW 38th ST., Oakland Park, FL 33309

Area: 35,296 sf

Year Built: 1960

Major Additions: North, South and Warehouse

Wall Type: CMU w/Stucco Finish

Roof Type: Rolled asphalt with fiberglass

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: 8:00 am to 5:00 pm, Monday through Friday; same Saturday operations. Warehouse open only when receiving material.

HVAC System Types:

Heating Source: Rooftop and split DX units utilize electric strip heaters to provide heating to the building.

Cooling Source: Rooftop units on North building, Split DX units are cooling South building, Warehouse office cooled by package DX unit.

Air Handling Units: Rheem and Ruud air-handling unit serve South building.

HVAC System Controls: Programmable thermostats are utilized to control the equipment in all building.

Park Administration Complex
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date
				HP	Volts	Amps	Phase	Type	Type	
AC-1 North	Fujitsu	Mini-Split	N/A	0.15	115	0.7	1	DX		2008
AC-2 North	Rheem	RBHC-14J07SFG	T M2904 08138	0.2	208/240	6	1	DX	5.3 kW	2005
AC-1 South	Allegiance	N/A	N/A	0.33	208/240		1	DX		2010
AC-2 South	Ruud	N/A	N/A	0.33	208/240		1	DX		2012
AC-3 South	Ruud	N/A	N/A	0.33	208/240		1	DX		2013
AC-4 South	Ruud	N/A	N/A	0.33	208/240		1	DX		2012

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrigerant	#	HP	Volts	Amps	Ph	
CU-1 North	AC-1 North	Fujitsu	AOU12RL2	EYN 034239	1	12.8	1	115	9.2	1	R-410A	1	2/25	115	0.7	1	2008
CU-2 North	AC-2 North	Rheem	RAND-018JAZ	7292F480524614	1.5	12.3	1	208/230	7.7	1	R-22	1	1/10	208/230	0.6	1	2005
CU-1 South	AC-1 South	Allegiance 13	4A7A3060D1000AA	10305YK22F	5	11.2	1	208/230	26.8	1	R-410A	1	1/5	208/230	1	1	2010
CU-2 South	AC-2 South	Ruud	14AJM60A01	7999W311202268	5	11.8	1	208/230	26.4	1	R-410A	1	1/3	208/230	2.8	1	2012
CU-3 South	AC-3 South	Ruud	14AJM60A01	7999W141313911	5	11.8	1	208/230	26.4	1	R-410A	1	1/3	208/230	2.8	1	2013
CU-4 South	AC-4 South	Ruud	14AJM60A01	7999W311202263	5	11.8	1	208/230	26.4	1	R-410A	1	1/3	208/230	2.8	1	2012

Rooftop/Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Rated Htg. Output MBH	Supply Fan					Compressor					Condenser Fans					Manuf Date
						Qty	HP	Volts	Amps	Ph	Qty	Volts	Amps	Ph	Refrig.	Qty	HP	Volts	Amps	Ph	
AC-1 Warehouse	Bard MFG	PA13482-A	288J082532604-1	4	5 kW	1	0.75	230/208	4.5	1	1	230/208	17/18.7	1	R-410A	1	0.25	230/208	1.5	1	2008
RTU-1 North	Carrier	50ES-A48-50	0311C30297	4	4 kW	1	1	208/230	3.6	1	1	208/230	13.7	3	R-410A	1	0.2	208/230	1.2	1	2011
RTU-2 North	Carrier	50GS-048-511	4305G31140	4	4 kW	1	1	208/230	7.6	1	1	208/230	11.6	3	R-22	1	0.5	208/230	2.1	1	2005
RTU-3 North	Carrier	50ES-A48-50	2413C46045	4	4 kW	1	1	208/230	7.6	1	1	208/230	13.7	3	R-410A	1	0.2	208/230	1.2	1	2013

INTEG WAST South Landfill
6541-7101 SW 205th AVE., Fort Lauderdale, FL 33332

Area: 17,847 sf

Year Built: 1990

Major Additions: None

Wall Type: Pre-cast concrete

Roof Type: Built-up roof

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: 8:00 am to 5:00 pm, Monday through Friday; closed, Sunday

HVAC System Types:

Heating Source: AHUs utilize electric strips to provide heating to the building.

Cooling Source: Air handling units and split systems utilize direct expansion to provide cooling to the building.

Air Handling Units: Carrier air handling units serve the building.

HVAC System Controls: Siemens Apogee building automation system controls portions of the building. Programmable thermostats are utilized to control some equipment in the building.

OPTERRA
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Central Homeless Assistance Center
920 NW 7th AVE., Fort Lauderdale, FL 33311

Area: 63,244 sf

Year Built: 1997

Major Additions: None

Wall Type: CMU w/ stucco

Roof Type: Membrane

Window Type: Single pane with metal frames

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: Temporary housing is occupied 24/7.

HVAC System Types:

Heating Source: Natural gas fired hot water boilers supply hot water for heating to some of the building. Electric strip heaters provide heating to some of the building.

Cooling Source: (2) Air cooled scroll chiller utilize chilled water to providing cooling to the building.

Air Handling Units: Multiple York air handling units serve the building.

HVAC System Controls: Siemens controls the chiller plant; programmable thermostats provide local control.

Chiller Summary Table

Building	Tag	Manufacturer	Model	Type	Nominal Tons	Compressor					Condenser Fans				
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase
Main	CH-1,2	Trane	CGAM110F2C02	A/C	110	2	460	42	3	410A	6	1.27	460	3.2	3
						2	460	51	3						

Booher Building
3275 NW 99th Way, Coral Springs, FL 33065

Area: 53,060 sf

Year Built: 1984

Major Additions: None

Wall Type: CMU w/ stucco

Roof Type: Membrane

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: Temporary housing is occupied 24/7

HVAC System Types:

Heating Source: Natural gas hot water boilers provide hot water to reheat coils for heating.

Cooling Source: (4) Rooftop units utilize direct expansion to provide cooling to the building.

HVAC System Controls: Electronic thermostats are utilized to control the equipment in the building.

Rooftop Unit Nameplate Data

Tag	Manufacturer	Model	Rated Clg. Tons	Supply Fan					Compressor				Condenser Fans					Manuf Date
				Qty	HP	Volts	Amps	Phase	Qty	Volts	Amps	Phase	Qty	HP	Volts	Amps	Phase	
1	McQuay	RPS050CSY	50	6		460	1.8	3	4	460	26.3	3	6		460	1.8	3	2008
2	McQuay	RPS050CSY	55	6		460	1.8	3	2	460	26.3	3	6		460	1.8	3	2008
									2	460	18.1	3						
3	McQuay	RPS050CSY	50	6		460	1.8	3	4	460	26.3	3	6		460	1.8	3	2008
4	McQuay	RPS050CSY	55	6		460	1.8	3	2	460	26.3	3	6		460	1.8	3	2008
									2	460	18.1	3						

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North Homeless Assistance Center
1700 Blount RD., Pompano Beach, FL 33069

Area: 44,254 sf

Year Built: 2001

Major Additions: None

Wall Type: CMU w/ stucco

Roof Type: Asphalt shingle

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: Temporary housing is occupied 24/7.

HVAC System Types:

Heating Source: Electric strips in the AHUs provide heating to the building.

Cooling Source: Split system units utilize direct expansion to provide cooling to the building.

HVAC System Controls: Local thermostats provide set point control; units operate 24/7.

DX Condenser / Compressor Summary

Tag	Manufacturer	Model	Tons	Compressor					Condenser Fans					Manf. Date
				#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1A, 1B	Rheem	RAWL-120CAZ	10		230	30.1	3	410A	2	1/3	230	2.4		2014
CU-2A	Rheem	RAWL-180CAZ	15		230	25	3	410A	3	1/3	230	2.4		2013
CU-2B	Rheem	RAWL-060CAZ	5		230	15.6	3	410A	1		230	1.2		2014
CU-3	Rheem	RAWL-240CAZ	20		230	33.3	3	410A	3	1/3	230	2.4		2010
CU-4A	Rheem	RAWL-240CAZ	20		230	33.3	3	410A	3	1/3	230	2.4		2013
CU-4B	Rheem	RAWL-150CAZ	12.5		230	22.4	3	410A	2	1/3	230	2.4		2012

North Family Success Center
2011 NW 3rd AVE., Pompano Beach, FL 33060

Area: 11,929 sf

Year Built: 1984

Major Additions: None

Wall Type: CMU w/ stucco

Roof Type: Membrane

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: Family Services operates 7:30 am to 5:30 pm, Tue, Wed, & Fri and till 6:30 pm Mon & Thu. The Health Clinic operates 8:00 am until 5:00 pm weekdays, except Wednesdays when it stays open until 9:00 pm. It is closed weekends and holidays.

HVAC System Types:

Heating Source: Electric resistance strips are used in the RTUs to provide heating to the building.

Cooling Source: Rooftop units utilize direct expansion to provide cooling to the building.

HVAC System Controls: Programmable thermostats are utilized to control the equipment in the building.

DX Condenser / Compressor Summary

Tag #	Bldg	Existing Unit Manufacturer	Existing Model	Design Cooling Capacity (MBH) Total	Design Cooling Capacity (MBH) Sensible	Design Heating Capacity, kW	Supply Fan, hp	Design Supply Fan, CFM	Return Fan, hp
1	4	Trane		83.4	61.2	9.3	1.5	3,200	N/A
2	4	Trane		60.3	32.9	9.3	0.75	1,750	N/A
3	3	Trane - older	TCC04CF300BD	37.2	27.1	10	0.75	1,450	N/A
4	3	Trane - older	TCC042F300BC	45	35.8	10	0.33	1,800	N/A
5	2	Trane		86.4	61	9.3	1	3,000	N/A
6	1	Trane - newer (2009)	DO NOT REPLACE - STRAIGHTEN FINS ON CONDENSING SECTION						
7	1	Trane - newer (2014)	DO NOT REPLACE						

Sexual Assault Treatment Center
400 NE 4th ST., Fort Lauderdale, FL 33301

Area: 10,643 sf

Year Built: 1956

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Rolled asphalt with fiberglass

Window Type: Single pane with metal frames

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: Operates 24 hours a day, 7 days a week.

HVAC System Types:

Heating Source: Split DX system utilize electric strips to provide heating to the building.

Cooling Source: Direct expansion condenser units provides cooling to the building.

Air Handling Units: Five air handling units and two dedicated outside air units serve the entire building.

HVAC System Controls: Electronic thermostats / programmable thermostats.

Sexual Assault Treatment Center
HVAC Equipment Inventory

DX Condenser / Compressor Summary

Tag	Equipment Served	Make	Model	Serial	Tons	New EER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrigerant	#	HP	Volts	Amps	Ph	
CU-1	AHU-1	Ruud	RANL-060CAZ	7394W270900331	5	11.5	1	208	15.6	3	R-410A	1	1/5	230	1.2	1	2009
CU-2	AHU-2	Ruud	RANL-060CAZ	7394W061000286	5	11.5	1	208	15.6	3	R-410A	1	1/5	230	1.2	1	2010
CU-3	AHU-3	Ruud	UAKB--060CAZ	7011M290711372	5	9.2	1	208	18.6	3	R-22	1	1/3	230	1.5	1	2007
CU-4	AHU-4	Ruud	RANL-060CAZ	7394W331011982	5	11.5	1	208	15.6	3	R-410A	1	1/5	230	1.2	1	2010
CU-5	AHU-5	Ruud	RANL-060CAZ	7394W061000311	5	11.5	1	208	15.6	3	R-410A	1	1/5	230	1.2	1	2010
CU-OAU1	OAU-1	Trane	4TTA3060D3000CA	15351SC15F	5	11.5	1	208	15.6	3	R-410A	1	1/5	230	1.2	1	2015
CU-OAU2	OAU-2	Trane	4TTA3060D3000CA	15351UDD5F	5	11.5	1	208	15.6	3	R-410A	1	1/5	230	1.2	1	2015

Note: The Air Handling Unit data not available – no access to ceiling space.

EPD Environmental Monitoring Facility
3211 College AVE., Davie, FL 33317

Area: 10,643 sf

Year Built: 2007

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Rolled asphalt with fiberglass

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: 7:00 am to 6:00 pm, Monday through Friday; some operation on Saturday and Sunday.

HVAC System Types:

Heating Source: Rooftop units and AHU units utilize electric strips to provide heating to the building.

Cooling Source: Venmar 50 ton rooftop DX units provide 100% outside air to lab area. Split DX units provide cooling to lab offices and common areas.

Air Handling Units: Lennox and Carrier air handling units serve offices and common areas.

HVAC System Controls: The building utilizes a Siemens Building Automation System (BAS). The system controls lab exhaust and fresh air control in addition to standard HVAC control.

EPD Environmental Monitoring Facility
HVAC Equipment Inventory
Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				HP	Volts	Amps	Phase	Type	Type		
AHU-1	Lennox	CBX32MV-036-230-6-04	N/A	0.50		4.3	1	DX	Elect. 8 kW	2007	Lab Offices
AHU-2	Lennox	CBX32MV-036-230-6-04	5807M20445	0.50	208/230	4.3	1	DX	Elect. 8 kW	2007	Offices
AHU-3	Lennox	CBX32MV-060-230-6-03	5807L19000	1.00	208/230	9.1	1	DX	Elect. 10 kW	2007	Lab
AHU-4	Lennox	CBX32MV-060-230-6-03	5807L20521	1.00	208/230	9.1	1	DX	Elect. 10 kW	2007	Lab
AHU-5	Lennox	CBX32MV-036-230-6-04	N/A	0.50	208/230	4.3	1	DX	N/A	2007	Offices
AHU-6	Lennox	CBX32MV-024/030-230-6-03	5808A20589	0.50	208/230	4.3	1	DX	Elect. 6 kW	2008	Offices
AHU-7	Lennox	CBX32MV-024-230-6-04	N/A	0.50	208/230	4.3	1	DX	Elect. 5 kW	2007	Conference
AHU-8	Lennox	CBX32MV-060-230-6-03	N/A	1.00	208/230	9.1	1	DX	Elect. 10 kW	2007	Lab
AHU-9	Lennox	CBX32MV-060-230-6-03	N/A	1.00	208/230	9.1	1	DX	Elect. 10 kW	2007	Small lab rms
AHU-10	Lennox	CBX32MV-060-230-6-03	N/A	1.00	208/230	9.1	1	DX	Elect. 10 kW	2007	Offices
AHU-11	Carrier	Split Unit Cassette	N/A		208/230		1	DX	N/A	2015	

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrigerant	#	HP	Volts	Amps	Ph	
CU-1	AHU-1	Lennox	XC21-036-230-03	5807M20596	3	11.0	1	208/230	16.7	1	R-410A	1	1/3	208/230	2.8	1	2007
CU-2	AHU-2	Lennox	XC21-036-230-03	5807M20604	3	11.0	1	208/230	16.7	1	R-410A	1	1/3	208/230	2.8	1	2007
CU-3	AHU-3	Lennox	XC21-060-230-03	5807M15050	5	11.2	1	208/230	25.7	1	R-410A	1	1/3	208/230	2.8	1	2007
CU-4	AHU-4	Lennox	XC21-060-230-03	5808A10731	5	11.2	1	208/230	25.7	1	R-410A	1	1/3	208/230	2.8	1	2008
CU-6	AHU-6	Lennox	XC21-036-230-03	5808D10402	3	11.0	1	208/230	16.7	1	R-410A	1	1/3	208/230	2.8	1	2008
CU-5	AHU-5	Lennox	XC21-036-230-03	5807M20603	3	11.0	1	208/230	16.7	1	R-410A	1	1/3	208/230	2.8	1	2007
CU-7	AHU-7	Lennox	XC21-024-230-03	5807M13161	2	11.0	1	208/230	10.3	1	R-410A	1	1/3	208/230	2.8	1	2007
CU-8	AHU-8	Lennox	XC21-060-230-03	5807M15908	5	11.2	1	208/230	25.7	1	R-410A	1	1/3	208/230	2.8	1	2007
CU-9	AHU-9	Lennox	XC21-060-230-03	5807M15909	5	11.2	1	208/230	25.7	1	R-410A	1	1/3	208/230	2.8	1	2007
CU-10	AHU-10	Lennox	XC21-060-230-03	5808A10730	5	11.2	1	208/231	25.7	1	R-410A	1	1/3	208/231	2.8	1	2008
CU-11	AHU-11	Carrier	24AHA418A300	2715X93421	5	11.5	1	208/232	9	1	R-410A	1	1/12	208/232	0.5	1	2015

Rooftop/Package Unit & Heat Pump Nameplate Data

Tag	Manufacturer	Model	Serial	Rated Clg. Tons	Rated Htg. Output MBH	Supply Fan					Compressor					Condenser Fans					Manuf Date
						Qty	HP	Volts	Amps	Ph	Qty	Volts	Amps	Ph	Refrig.	Qty	HP	Volts	Amps	Ph	
OARTU-1	Venmar	AHE500-75H-24S-0.16	SO003389-01	40	Elect. 60kW	1	7.5	208	19.9	3	4	208	38.5/47.1	3	R-22	2		208	8.2	3	2007
OARTU-2	Venmar	AHE500-75H-24S-0.16	SO003389-02	40	Elect. 60kW	1	7.5	208	19.9	3	4	208	38.5/47.1	3	R-22	2		208	8.2	3	2007

EAP Our House
408 NE 4th ST., Fort Lauderdale, FL 33301

Area: 1,127 sf

Year Built: 1952

Major Additions: None

Wall Type: Wood frame

Roof Type: Asphalt shingle

Window Type: Single pane with metal frames

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: 24 hours a day, 7 days a week, operations.

HVAC System Types:

Heating Source: Split DX system utilize electric strips to provide heating to the building.

Cooling Source: Direct expansion condenser unit provides cooling to the building.

Air Handling Units: Ruud air handling unit serves the entire building.

HVAC System Controls: Electronic thermostats / programmable thermostats.

EAP Our House
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date
				HP	Volts	Amps	Phase	Type	Type	
AHU-1	Ruud	UHSA-HM3017JA	M0608 02339	0.25				DX	EDH (Zone)	2008

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrig.	#	HP	Volts	Amps	Ph	
CU-1	AHU-1	Ruud	13AJA30A01757	8343W221127969	2.5	11.5	1	230	14.1	1	R-22	1	1/6	230	0.8	1	2011

Mass TRAN, North Maintenance

3201 Copans RD., Pompano Ranch, FL 33069

Area: 195,189 sf

Year Built: 1983

Major Additions: Building 2 was added in 2005. Advised that Buildings 1 and 3 will be demolished in near future but timeline is uncertain; Buildings 2 and 4 will remain.

Wall Type: CMU w/ stucco

Roof Type: Building 4 is metal, others are membrane

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: Approximately 7:00 am to 5:00 pm, Monday through Friday; Operations is operated 7 days a week.

HVAC System Types:

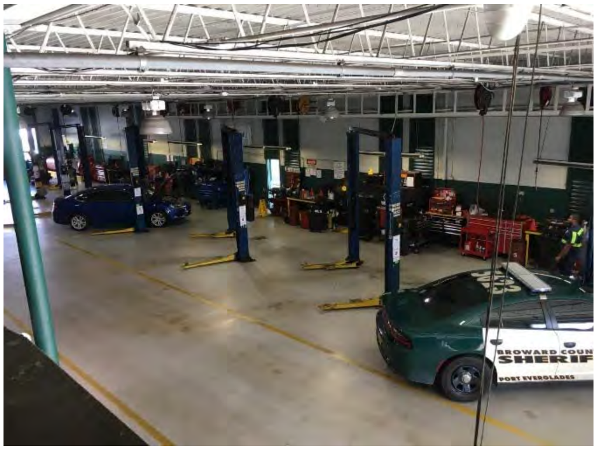
Cooling Source: Buildings 1 and 4 are conditioned with (3) air-cooled chillers totaling about 180 tons that deliver chilled water to provide cooling to the buildings. Building 2 is conditioned with split systems. BARD packaged units, portable A/C units, split systems, and Air Handling units utilize direct expansion to provide cooling to the building.

HVAC System Controls: Electronic thermostats are utilized to control the equipment in the building.

DX Condenser / Compressor Summary

Area Served	Existing Unit Manufacturer	Existing Model	Compressor			Condenser				
			Volts	Amps	Phase	Qty	hp	Volts	Amps	Phase
Bldg 2 - Maint. Office in SE Corner		R2A360GHR200	208/230	16.4	3	1	0.25	208/230	1.4	1
Bldg 4 - CU #3 - Print Shop	Trane	TTA120A400FA	460	16.5	3	1		460	2.7	1

BSO Maintenance Facility
2001 NW 31st AVE., Lauderdale Lakes, FL 33311



Area: 14,800 sf

Year Built: Unknown

Major Additions: None

Wall Type: CMU w/ stucco finish

Roof Type: Membrane

Window Type: None

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: 7:00 am to 10:00 pm, Monday through Saturday

HVAC System Types:

Heating Source: Air handling units utilize electric heat strips.

Cooling Source: Direct expansion split systems condition select offices.

Air Handling Units: Air handling units are located in the mezzanine.

HVAC System Controls: Local thermostats control the units and typically operate 24/7.

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Phase	Refrigerant	#	HP	Volts	Amps	Phase	
CU-1, 2	Office AHUs	Rheem	13AJN48	8394W341102487	4	1	230	21.8	1	410A	1	1/5	230	1.2	1	2011

<u>BCJC South Parking Garage</u>
612-644 South Andrews AVE., Fort Lauderdale, FL 33301

Area: 14,397 sf (Office & Retail)

Year Built: 2013

Major Additions: None

Wall Type: Concrete

Roof Type: No roof.

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: 8:00 am to 7:30 pm, Monday through Sunday. Garage open extended hours. Office area 7:00 am to 5:00 pm, Monday through Friday.

HVAC System Types:

Heating Source: Heating in this facility is accomplished with electric strip heating that are in either the air handling units, mounted in the ductwork.

Cooling Source: 50 Ton Air-cooled chiller provides chilled water to the retail and office area located on the first floor of the building.

Air Handling Units: One York AHU with VFD serves the first-floor office and retail areas.

HVAC System Controls: First floor office area HVAC equipment is controlled by Johnson Controls Building Automation System (BAS) that was installed when the building was constructed.

BCJC South Parking Garage
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				HP	Volts	Amps	Phase	Type	Type		
AHU-T1	York	XTI-060X108-BALA046A	CMAM XT0041	15.00	460	17.7	3	DX	Elect.	2013	Retail &Offices

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER/SEER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrig.	#	HP	Volts	Amps	Phase	
CU-Roof	AHU-1 Office	York	J40YDC00A4AAA1A	N1L3167217	50	11.6	4	460	16.7	3	R410A	2	1 1/2	460	2.9	3	2013

HIGH & BRDG Mosquito Control
1200 South University DR., Pembroke Park, FL 33325

Area: 9,865 sf

Year Built: 1970

Major Additions: None

Wall Type: CMU w/Stucco Finish

Roof Type: Rolled asphalt with fiberglass, Metal

Window Type: Single pane with metal frames

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: 8:00 am to 5:00 pm, Monday through Friday; extended and weekend operations is seasonal.

HVAC System Types:

Heating Source: DX units utilize electric strips to provide heating to the building.

Cooling Source: Cooling is provided by direct expansion condenser units to the building.

Air Handling Units: AHU units serve office area and chemical storage.

HVAC System Controls: Electronic thermostats / programmable thermostats are utilized to control the equipment with in the buildings.

HIGH & BRDG Mosquito Control
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date	Area Served
				HP	Volts	Amps	Phase	Type	Type		
AHU-1	Rheem	RHGE-075ZL	140F080404489	1.50	208	5.8	3	DX	EDH (Zone)	2004	Main Office Bldg
MS-1	Mitsubishi	MSY-GL24NA	5004003 T	0.1	230	0.76	1	DX	None		Chemical Storage

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	Compressor					Condenser Fans					Manf. Date
						#	Volts	Amps	Ph	Refrig.	#	HP	Volts	Amps	Ph	
CU-1	AHU-1	Rheem	RAWD-078CAZ	6996F400707516	6.5	1	208	20.8	3	R-22	1	1/3	230	2.2	1	2007
MSCU-1	MS-1	Mitsubishi	MUY-GL24NA		2	1	230	12.9	1	R-410A	1		230	0.93	1	

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Window AC / Compressor Summary

Tag	Manufacturer	Model	Tons	New EER/SEER	Electrical Data				Heat		Manf. Date
					Volts	Amps	Phase	Refrigerant	Type	Btu/hr Output	
WAC-1	LG	LW2412HR	2	8.5	230	16	1	R-410A	Electric Strip	11600	2014
WAC-2	LG	LW2412HR	2	8.5	230	16	1	R-410A	Electric Strip	11600	2014
WAC-3	LG	LW2412HR	2	8.5	230	16	1	R-410A	Electric Strip	11600	2014

South Maintenance Shop
8500 Griffin RD., Davie, FL 33328

Area: 6,024 sf

Year Built: 1988

Major Additions: Various

Wall Type: CMU w/Stucco Finish

Roof Type: Rolled asphalt with fiberglass, Metal

Window Type: Single pane with metal frames, tinted

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: 7:00 am to 5:00 pm, Monday through Friday; occasional after-hours operations.

HVAC System Types:

Heating Source: DX systems utilize electric duct heaters to provide heating to the building.

Cooling Source: Cooling is provided by direct expansion condenser units to the building.

Air Handling Units: AHU units serve Building A and Building C at the facility.

HVAC System Controls: Electronic thermostats / programmable thermostats are utilized to control the equipment with in the buildings.

South Maintenance Shop
HVAC Equipment Inventory

Air Handling Unit Data

Tag	Air Handler Manufacturer	Air Handler Model	Serial	Motor				Cooling Coil	Heating Coil	Manf. Date
				HP	Volts	Amps	Phase	Type	Type	
AHU-1	Goodman	AR61-1	207448906	0.75	230	3.9	1	DX	EDH (Zone)	2007
AHU-2	Goodman	AR36-1	202437329	0.3	230	2.15	1	DX	EDH (Zone)	2002

DX Condenser / Compressor Summary

Tag	Equipment Served	Manufacturer	Model	Serial	Tons	New EER	Compressor					Condenser Fans					Manf. Date
							#	Volts	Amps	Ph	Refrig.	#	HP	Volts	Amps	Ph	
CU-1	CU-1 (Bldg A)	Goodman	CLJ60-1	206543647	5	10.7	1	230	25	1	R-22	1	1/4	230	1.8	1	2006
CU-2	CU-2 (Bldg C)	Goodman	GSC030361DE	707660177	3	11.5	1	230	12.2	1	R-22	1	1/6	230	1.1	1	2007

MASS Tran Northeast Terminal
304 Hammondville BLVD., Pompano Beach, FL 33060

Area: 2,000 sf

Year Built: 2007

Major Additions: None

Wall Type: CMU w/ stucco

Roof Type: Membrane

Window Type: Single pane with metal frames and tint

Lighting Type: A detailed inventory of the existing lighting system is included in Appendix A.

Occupancy Schedule: Office hours vary

HVAC System Types:

Cooling Source: (1) Rooftop unit utilizes direct expansion to provide cooling to the building.

HVAC System Controls: Local thermostat control only

5. Measurement & Verification Plan

The heart of any performance contract is the guarantees with which it is associated. Not only the guaranteed price of the installation but the guaranteed savings generated from the installation of the energy conservation measures. While the installation guarantee is easy to track and verify, the savings guarantee is more complex, can be done in various ways, and can be left open to interpretation. However, when done correctly, not only can the savings be measured and verified, but the County can achieve many additional benefits from the equipment installed, over and above the guaranteed savings.

The following section introduces OpTerra's Energy Management Group, and outlines some of the services it can provide. Specifically, these topics will address:

- Energy Management Group Overview – Including its staff, experience, and capabilities.
- Measurement and Verification (M&V) of Savings – What are the options, when should they be applied, and what are the benefits of each.
- Client Specific Recommendation – Based on the parameters of this analysis, these are our recommendations for a workable M&V plan that gives the greatest ongoing benefit, and ongoing Monitoring Services. These are included in the base Monitoring fee.
- Monitoring Services – The scope of Standard Services included from the Energy Management Group.

Energy Management Group Overview

OpTerra has one of the largest and most experienced M&V Departments in the industry. A professional engineer with over 25 years in performance contracting leads a team of 13 full-time dedicated staff, with an average tenure in energy services of over 10 years each. The Energy Management Group has overseen hundreds of guarantees and currently has over 120 clients with ongoing guarantees that total over 500 million dollars.

The depth and diversity of the personnel prepares them to handle a variety of ongoing services, as detailed in this report. In general, these tasks are overseen by three divisions, each with its own area of expertise.

Energy Accounting: This team oversees the guarantee portion of the monitoring contracts. They are responsible for analyzing the utility consumption, generating the monitoring reports, tracking changes to the facilities, and maximizing the energy savings. This team includes on-site dedicated Energy Resource Managers for some of our larger contracts.

Electronic Monitoring: The Electronic Monitoring division has extensive experience in monitoring, commissioning, and troubleshooting over 25 different types of Building Automation Systems (BAS). This group has daily responsibility for tracking the performance of the building automation systems installed or upgraded as part of virtually all OpTerra contracts. BAS installation/improvements often account for 25% of the energy savings on a project, but their effectiveness can be diminished over time by building occupants through "unmanaged equipment-overrides". Through continuous periodic monitoring of these systems, unintentional overrides and control component failures are detected and reported back to our customers before substantial energy savings are lost.

Support Services: This team of professionals handles most of the extended services detailed below, including UtilityVision®, OpTerra's suite of services centered on a Cellular-based energy information system. UtilityVision integrates seamlessly throughout the Monitoring program, allowing the Energy Management Group to offer a greater level of service to our Clients at a lower ongoing cost.

Most importantly, the OpTerra Energy Management Group works as a team to deliver a program specifically designed to meet the needs of each client.

Measurement & Verification of Savings

One key to successfully achieving the predicted savings of any project is the accuracy measurement techniques employed, and the validity of the energy baselines. To assure confidence in these processes, OpTerra will follow the International Performance Measurement and Verification Protocol (IPMVP). This protocol is recognized by the National Association of Energy Service Companies (NAESCO) as the standard guideline of how savings resulting from energy conservation projects should be measured.

The IPMVP defines four broad options for measurement and verification of energy savings. Each option is applicable to specific situations; and, oftentimes, more than one option is possible. Multiple options are often implemented on a single project. The broad categories of the IPMVP lay out as follows:

- Option A – Partially Measured Retrofit Isolation – End-use measurements, some stipulations.
- Option B – Retrofit Isolation – Complete end-use measurements.
- Option C – Whole Building – Energy use analysis on multiple systems.
- Option D – Calibrated Simulation – Computer modeled building savings.

Implementation of a verification plan for the diverse types of ECMs typically involved in a performance contract usually requires a combination of methods to successfully measure savings. Even for a given ECM, verification categories may be crossed by combining a stipulated and an end-use measurement component into the savings calculation. Factors that guide the selection of an M&V method for each ECM include:

* Cost of measurement vs. savings
* Timing of measure installation
* Likelihood of future ECMs at the same facility
* Likelihood of future construction at the facility
* Degree of sub-metering within the facility
* Complexity of ECMs to be installed
* Level of interaction between ECMs
* Dynamics of the facility's energy baselines
* Likelihood of sustainable savings from the measures

Due to the variables and dynamics that are unique to each performance contract, and often to each facility within a performance contract, an individual measurement and verification plan must be developed for each situation. While the specifics may vary, the general method employed will always follow one of the methods outlined in the IPMVP.

The following paragraphs detail the four potential M&V methods:

Option A – Partially Measured Retrofit Isolation

This option allows for the energy savings to be calculated using a sampling of field measurements combined with stipulated parameters. The savings, once calculated, are usually stipulated to for the life of the project. Ongoing actual measurements may or may not be used in this verification technique depending on whether the predicted savings and/or volatility of the measures implemented warrant the expenditure of additional field measurements.

A possible application for using this option would be for lighting efficiency improvements whose performance may be relatively stable and not interdependent with other measures. The savings for the lighting upgrade would be quantified by measuring before and after power consumption for a representative sample of lighting circuits and by stipulating or agreeing to the hours of operation of each circuit.

Option B – Retrofit Isolation

Energy savings performance of energy conservation measures are measured and verified at the-end use site. Option B techniques are designed for projects where long-term continuous measurement of performance is desired and warranted. Under Option B, individual loads are continuously monitored to determine performance; and this measured performance is compared with a baseline to determine savings.

A possible application for Option B measurement would be for chiller efficiency improvements in a setting of continuous change at a facility. The savings for the chiller upgrade would be quantified by measuring the existing chiller's performance in kW/Ton at several points in load while maintaining steady condensing temperature. The same chiller performance curve would be developed for other steady condensing temperatures, resulting in a three-dimensional load curve for the existing chiller or chillers. After the retrofit, a similar 3-D load curve would be measured for the chiller. Instrumentation would be installed to sample the actual tonnage being delivered to the building cooling loads during the entire measurement period, and the power reduction interpolated from the before and after performance curves.

This type of measurement can be expensive and complex, but may be implemented as an alternative to Option C to ensure the long-term success of the energy conservation measures.

Option C – Whole Building

Option C verification techniques measure savings by comparing the post-retrofit overall energy use in a building or facility with pre-retrofit energy baselines. Implicit in this measurement option is the necessity of identifying and accounting for the effects of changes to the facilities during the measurement period that are beyond the scope of the measures installed. The impact of building additions, changes in operating hours, remodeling projects, etc., that are implemented by the customer during the measurement period must have their energy impact accounted for if the true savings from the energy conservation measures is to be assessed. This process can be time consuming and expensive in facilities that are very dynamic.

However, there are many benefits to an Option C measurement. When significant interactions between energy consuming systems and energy conservation measures are present, and for assessing savings for measures that are not easily measured directly, Option C may be the only viable method. Option C savings calculations also most closely emulate the bills from the utility company, and the calculations are easy to understand and explain. The typical calculation of savings is as follows:

Total Energy Savings ($) = (Energy Use Baseline – Actual Usage) * Contractual Energy Rates

Where:

Energy Use Base – Historical Energy Consumption; modified over time to account for changes to the facility.

Actual Usage – Actual energy usage through the meter.

Contractual Energy Rates – Energy rates derived from current utility bills and rate structures, which are used for the calculation of savings.

Option D – Calibrated Simulation

Option D verification techniques calculate savings by utilizing a carefully calibrated hourly building simulation model to examine building performance before and after the digital implementation of energy conservation measures. Obviously, a high degree of comfort in both the simulation and the operator is necessary for this method to work to the satisfaction of both parties.

Calculated Savings - Stipulated

While not directly defined as an IPMVP option, the protocol recognizes that there are instances when measurement and verification of the savings is not warranted. In cases where the cost of measurement is too high as compared to the savings, where the parameters preclude accurate measurements, or where the confidence of the savings projections is high, the Client and OpTerra may agree to stipulate to those projected savings for the term of the project without any additional measurement and verification of the savings.

Monitoring Services

The long-term success of any performance contract relies on the continued efforts of the Owner and the Energy Service Company. To this end, OpTerra offers a monitoring service as part of the energy guarantee that focuses on the measurement, verification, and the maintenance of the energy savings. This section describes the standard and optional services which can be provided. However, it is understood that the needs of our clients vary, and every effort will be made to meet any additional needs that may arise.

Recommended Program

Based on the proposed scope of the project, OpTerra recommends an M&V plan that balances verification of guaranteed savings with on-going service fees. The proposed scope spans forty-five sites which account for more than 150 electric meters. To provide on-going monitoring services on that number of electric meters would result in a substantial investment by the County, negating all or most of the projected savings at the majority of these facilities. As a result, OpTerra is proposing an M&V Plan that includes Option A, Option B, Option C and a small amount of stipulated energy savings.

Proposed Measurement & Verification Plan
(Breakdown by Method)

M&V Method	Parks	Libraries	Office & Courthouse	Health & Lab	Park, Wrhs, Repair	Total Energy Savings	% of Total
Option A	$82,263	$86,582	$59,531	$38,581	$130,228	$397,185	34.1%
Option C	$0	$170,130	$438,272	$6,332	$84,639	$699,373	60.0%
Stipulated	$15,482	$18,879	$26,372	$5,746	$1,673	$68,152	5.9%
TOTAL	$97,745	$275,591	$524,175	$50,659	$216,540	$1,164,710	100.0%

Note: There is a small percentage (approx. 4.8%) of Option A savings that is attributed to indirect air-conditioning savings which is a result of reduced heat gain within the occupied space. These savings will be stipulated; however, they will be reported in the Option A report and therefore, included in the Option A line item.

To minimize monitoring equipment costs and on-going service fees, OpTerra is proposing Option C (Whole Building) measurement and verification at six of the largest facilities for Energy Conservation Measures and Option B at another five facilities that are proposed for Solar PV installations. The following buildings and specific meters are recommended to follow Option C procedure, which will require their utility meters to be tied into our Energy Website www.utilityvision.com.

Option C (Whole Building) Sites

Site	ECM Types	Meter Type	Meter #	Applicable Rate
Public Safety Building	Building End-Use & Solar PV	Electric	RV558V0	CILC-1D
North Regional Courthouse	Building End-Use & Solar PV	Electric	RV850V0	GSLD-1
Government Center West	Building End-Use & Solar PV	Electric	RV755V0	GSLDT-1
African American Library	Building End-Use	Electric	MV76938	GSDT-1
West Regional Library	Building End-Use & Solar PV	Electric	RV713V0	GSD-1
Northwest Regional Library	Building End-Use & Solar PV	Electric	KV78257	GSD-1

BCJC South Parking Garage	Solar PV	Electric	KV52580	GSD-1
Family Success Center	Solar PV	Electric	KJ39709	GSD-1
		Electric	KJ39744	GSD-1
Mass Trans North Maintenance	Solar PV	Electric	MV87032	GSDT-1
Traffic Engineering	Solar PV	Electric	MV54711	GSDT-1
Weston Library	Building End-Use & Solar	Electric	KV51568	GSD-1

Lighting generates a significant amount of energy savings for this project and also the simplest to accurately measure at a reasonable cost. The remaining energy conservation measures, while valid and valuable to the project, are more costly to measure and the cost of the measurement is relatively higher when compared to the projected savings. Specifically, OpTerra recommends:

Site	ECM Category	Meter Type	Meter #	Applicable Rate	Recommended M&V Plan
All Sites (Except the six Option C Sites)	Interior/Exterior/ Site Lighting	Electric	Various	Various	Option A
	Water Conservation	Water	Various	Various	Option A
	Building Envelope	Electric	Various	Various	Calculated Savings - Stipulated
	Controls	Electric	Various	Various	Calculated Savings - Stipulated
	Mechanical	Electric	Various	Various	Calculated Savings - Stipulated
	Other	Electric	Various	Various	Calculated Savings - Stipulated

Interior/Exterior/Site Lighting Upgrades - Option A

Option A Method will be used to measure and verify the electricity savings from this retrofit. The difference in the existing lighting wattage versus the new lighting wattage shall be measured for a representative sample of the lighting circuits. The operating hours for each usage type classification will be stipulated and agreed upon between OpTerra and Broward County. The measured savings shall then be calculated by multiplying the measured wattage difference by the lighting on time hours.

Once measured and verified, these savings will be agreed to be sustained for the term of the contract.

Water Conservation Upgrades - Option A

Option A Method will be used to measure and verify the water savings from this retrofit. The difference in the existing fixture usage versus the retrofitted fixture usage shall be measured for a representative sample of each type of retrofit. The measurement and verification process adheres to IPMVP recommendations and FEMP guidelines. Sample size is compliant with guidelines established in the FEMP Measurement and Verification for Federal Energy Projects, Option A (Retrofit Isolation with Key Parameter Measurement) Version 3.0. The usage assumptions for each fixture type will be stipulated and agreed upon between OpTerra and Broward County. The measured savings shall then be calculated by multiplying the measured wattage difference by the fixture usage.

Once measured and verified, these savings will be agreed to be sustained for the term of the contract.

Remaining ECM's – Calculated Savings-Stipulated

Due to the cost of providing measurement and verification services versus the expected savings, no additional or ongoing measurements will be taken for these measures. The expected savings will be stipulated for the term of the contract.

Utilityvision® (Provided for all Option C meters)

UtilityVision® is an enhanced automation and utility monitoring system available from OpTerra. As an energy management data analysis tool, the web-based energy consumption tracking system collects and reports energy consumption data to customers over the Internet. OpTerra developed UtilityVision® for use in building complexes such as commercial developments, educational institutions, manufacturing facilities, housing developments, and municipalities.

UtilityVision® allows customers to become more self-sufficient in analyzing energy consumption for energy management purposes. The system will integrate with your existing Ethernet LAN or use a dedicated cellular link. It consists of a Transmission Control Protocol/Internet Protocol (TCP/IP) network host that receives consumption information from customer meters and presents data as tables or charts from the UtilityVision® website. Customers may view and print reports of historical, as well as real-time energy consumption data.

UtilityVision® was developed to give customers a pricing advantage in negotiating rates in deregulated markets. Although the ability to collect detailed electricity usage data represents the primary benefit for customers, the system can also monitor other types of energy consumption such as hot or chilled water, natural gas, or steam. The proposed UV systems for the Broward County project is monitoring main electric meters.

The UtilityVision® system is a turnkey installation that involves mounting the metering platform and meters, installing cabling and connections, and configuring the interface. The system's modular structure makes it easy to install, reconfigure and expand in response to additional customer requirements.

Three components of OpTerra's UtilityVision® service are currently available to help customers begin the data collection process.

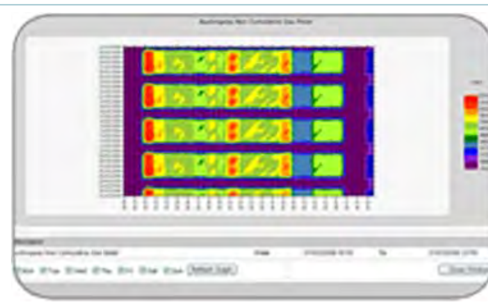
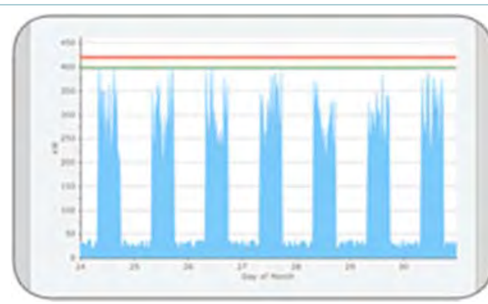
Load Profiling – Web-based reports profile electric consumption and demand data by day, week and year for individual meters. UtilityVision® accumulates data in 15-minute intervals for each meter and reports energy information for up to 13 months and graphs up to a year's worth of information. UtilityVision® also monitors other electric properties such as power factor, amps and voltage, as requested.

Meter Aggregation Analysis – The aggregation of consumer data from various meters into a single analysis report provides a cumulative profile of electric consumption and demand data by day or day of week for a month. A cumulative report accurately represents the overall peak impact of all meters for the requested reporting units.

Sub-metering (optional) – Installation of sub-meters on buildings or individual units whose consumption is also registered by another meter along with other buildings or units. Sub-metering allows customers to accumulate data for energy analysis, cost allocation, or troubleshooting by reporting unit. For example, customers could sub-meter based on such factors as buildings, floors, manufacturing processes, or housing units, and obtain usage data by day of week and/or by year.

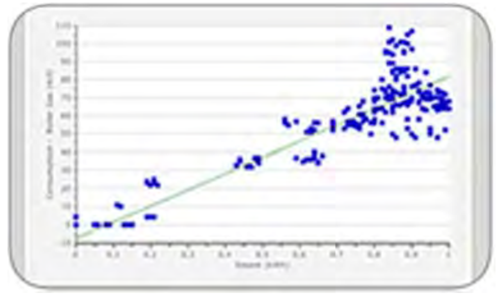
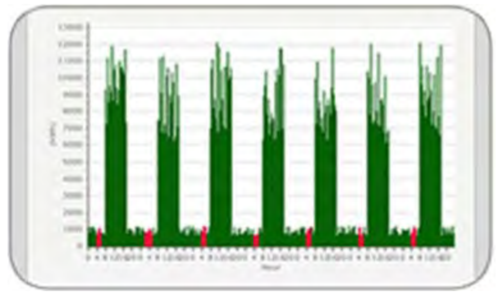
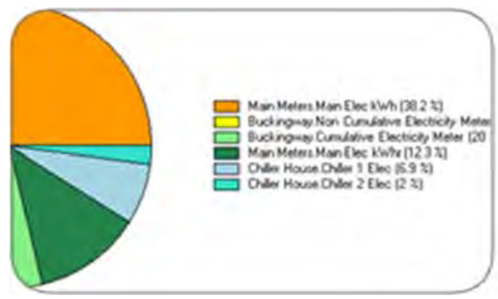
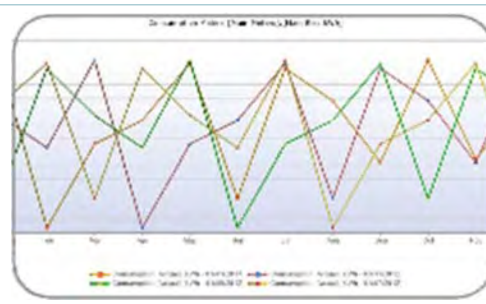
On the following pages you will see some sample reports that can be viewed from our www.utilityvision.com website.

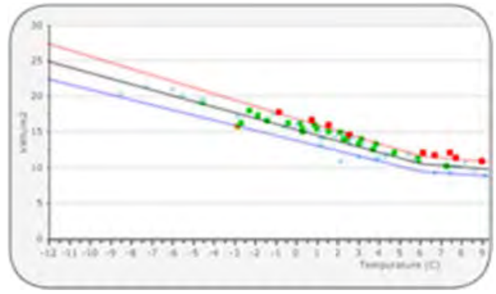
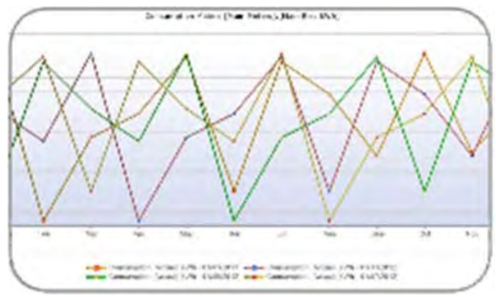
Sample Reports

Report	Description	Sample View
Energy Analysis	The Energy Analysis facility provides a wide range of analysis techniques for all types of data. This includes viewing as a graph or table, exporting the data and viewing the cost of energy.	
Single Meter Analysis	The Single Meter Analysis facility provides a wide range of analysis techniques for all types of data. This includes viewing as a graph or table, exporting the data and viewing the cost of energy specific to a single meter.	
Electricity Analysis	The Electricity Analysis facility provides a range of techniques specific to Electricity Meters. This includes: • Contract Analysis • Peak Demand • Load Factor • Power Factor.	

Broward County

Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:
Part Two - Investment Grade Audit Report

Report	Description	Sample View
Performance Analysis	The Performance Analysis facility allows the comparison of consumption data with production or degree day data using a number of analysis techniques.	
Baseload Analysis	The Baseload Analysis facility provides the ability to view the baseload consumption of a meter. This can be viewed for the active or inactive periods as defined by the meter configuration.	
KPI Ranking	KPI Ranking analysis allows the comparison of sites or meters based on a range of Key Performance Indicators.	
Batch Processing	Batch Processing Analysis allows the comparison of consumption data of each batch run over a selected period of time.	
Data Export	Data Export allows the extract of a specific date range to a common format.	

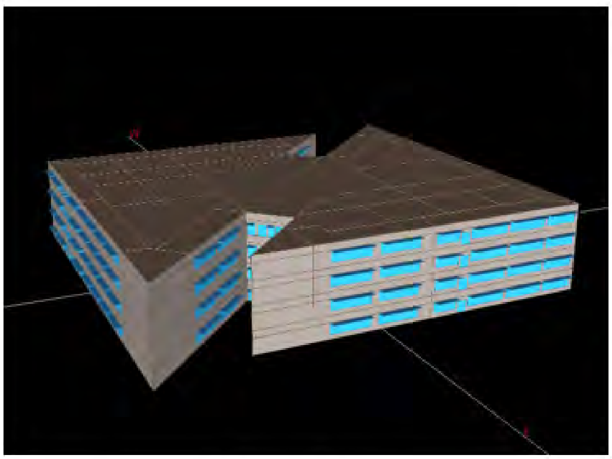
Report	Description	Sample View
Energy Temperature Analysis	Energy Temperature Analysis allows the analysis of energy usage against outside temperature. The target line is derived from either the previous year's usage or pre-set with the graph highlighted over usage, under usage or normal usage compared to a percentage deviation from this target.	
Trend Line Analysis	Trend Line Analysis allows you to plot up to 4 trend lines on a single graph. This could be consumption, cost, CO2 or CO2e and can also be displayed as a ratio when combined with production data. The data could also be either from actual data, MVLR predicted models or budget data.	

CONTROLS and MECHANICAL Savings Calculations

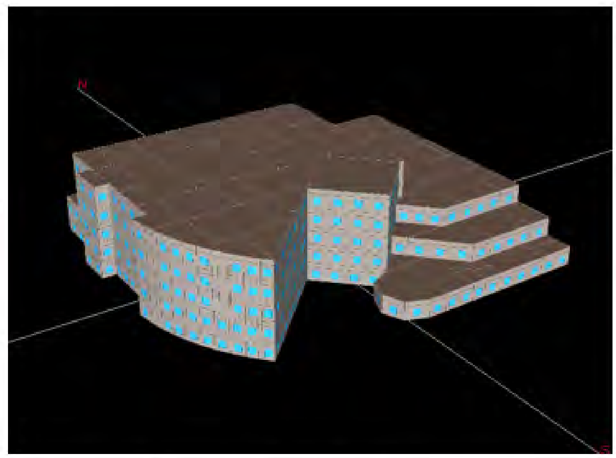
- M1 Install New Chiller
- M4 Replace R-22 Split System (Evap Coil & Condensing Unit Only)
- M5 Replace R-22 Rooftop Unit (RTU)
- M7 CHW Coil Cleaning
- M8 Install New AHU
- M12 Repair Smoke Damper Leakage
- M13 Eliminate Uncontrolled Supply Air Diffusers in Mechanical

Building Simulations Models

Building energy simulation was performed for select buildings: Public Safety Building, African American Library, North Regional Courthouse, Government Center West, Hallandale Library, Stirling Road Library, Sexual Assault Treatment Center, and Dan Pearl Library. The simulations were performed using eQUEST® is energy simulation tool. eQUEST® uses the DOE-2 energy simulation program, which is industry standard, originally developed by the U.S. Department of Energy.



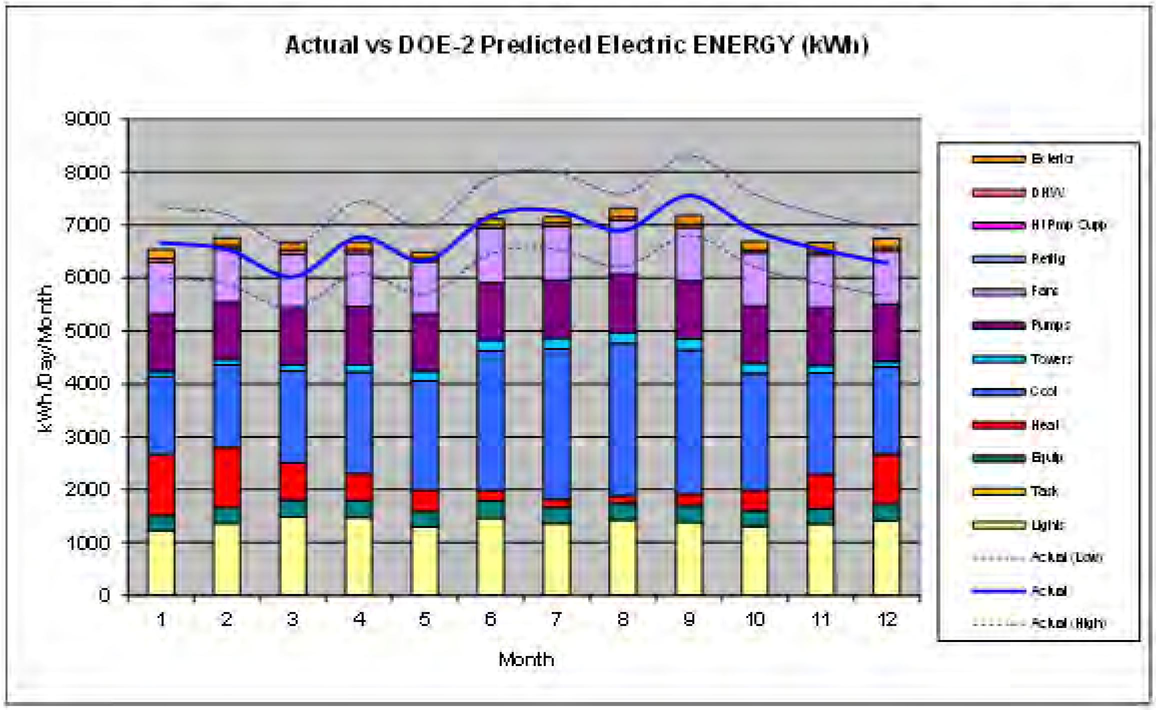
Government Center West Model



Public Safety Building Model

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

North Regional Courthouse: Actual (Solid Blue Line) vs Modeled (Columns)



Broward County
Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Energy Savings Calculations - Spreadsheets

Building energy savings calculations for ECMs not simulated were performed utilizing spread calculations. This alternate method utilized for calculating energy and water savings was modeling of the individual ECMs with spreadsheets utilizing bin weather data, annual load variation, equipment energy use, and schedule parameters. The savings were calculated as the difference between existing equipment definition (efficiencies, full load energy use and capacities, part-load profiles, and operating schedule) and proposed equipment modification or replacement.

BECalc - INPUT

General and Envelope information:

Occupants	People	100		
	Sensible H_S	215	(BTU)	
	Latent H_L	185	(BTU)	
	Type	Office		
Building	Floor Area	5848	(Sq.Ft.)	
	Ground Floor	3672		
Roof	Roof area	3672	(Sq.Ft.)	
	Roof Ts	1.38	(mult. for radiation)	
	U-Value	0.16	6.25	R
Ext. Walls	Total Area	3872		
	Wall Ts	1.05	(mult. for radiation)	
	U-value	0.20	5.00	R
Windows	Total Area	928		
	Window Multiplier	0.34	(mult. for windows)	

Setpoints and Airdistribution:

Cooling	Cooling Temp	76	(F)	
	Cond. Wet Bulb	55		
	Supply Air Temp	55		
Heating	Heating Temp	70	(F)	
	Heating needed @	62	below (F) Outdoor	
	Heating Capacity	17	(kW)	(total xxkW)
Fans	Supply FANS	3.2	(kW)	
		8230	(CFM)	
	Outside Air	10%	(%)	
		823	(CFM)	
	Exhaust FANS	0.4	(kW)	
		625	(CFM)	
	Infiltration	3.0%	(%)	of Fan CFM
		246.9	(CFM)	

Building Equipment information:

Lighting	Indor	6.37	(kW)	1.1	W/sf
	Outdoor	0.67	(kW)		
Equipment	Office	2.25	(kW)		
	Other	4.60	(kW)	Kitchen, Ref.	
	Outdoor Eq.	1.65	(kW)	Elev, Soda	

Airconditioning Equipmet:

AC Unit	kW/Ton	1.249	
	kW	11.2	kW
	Compressor	7.5	Tons
		1.49	kW/Ton (Calculated)
		9.00	EER (new, est)

Note: kW/Ton - (includes comp & condenser fans & aux. equip.)

		Walls	Wins	Net Wall
Wall & Win Areas	North	748	0	748
	East	1428	464	964
	South	748	0	748
	West	1428	464	964
		4352	928	3424

Efficiency Conversion Formulas:

EER = COP * 3.413
COP = 1 / EIR
kW/ Ton = 12/ EER
EIR = (kW/Ton) * (3413/12000)

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

BECalc - SCHEDULES

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Day.Type	1	1	1	1	1	2	2

Heating OFF when temp 55 or less
Cooling OFF when temp 85 or greater

SCH.1 WEEKDAYS

	2	3	4	5	6	7	8	9	10	11
	Occup.	Lighting	OFF Eq.	OTH Eq.	Exhaust	FANS	Heating	Cooling	Out Eq.	O-Lights
0	0.0	0.10	0.05	0.04	0.0	0.14	55.0	75.0	0.10	0.2
1	0.0	0.10	0.05	0.04	0.0	0.14	55.0	75.0	0.10	0.2
2	0.0	0.10	0.05	0.04	0.0	0.14	55.0	75.0	0.10	0.2
3	0.0	0.10	0.05	0.04	0.0	0.14	55.0	75.0	0.10	0.2
4	0.0	0.10	0.05	0.04	0.0	0.14	55.0	75.0	0.10	0.2
5	0.0	0.10	0.05	0.04	0.0	0.14	55.0	75.0	0.10	0.2
6	0.0	0.10	0.05	0.04	0.0	0.19	58.0	75.0	0.10	0.2
7	0.0	0.10	0.05	0.07	0.0	0.19	60.0	75.0	0.10	0.0
8	0.1	0.10	0.05	0.10	0.2	0.28	68.0	75.0	0.10	0.0
9	0.1	0.50	0.10	0.10	0.2	0.37	68.0	75.0	0.20	0.0
10	0.1	0.50	0.15	0.10	0.2	0.47	68.0	75.0	0.30	0.0
11	0.1	0.60	0.15	0.10	0.3	0.47	68.0	75.0	0.30	0.0
12	0.2	0.60	0.15	0.10	0.3	0.47	68.0	75.0	0.30	0.0
13	0.2	0.70	0.15	0.15	0.3	0.56	68.0	75.0	0.30	0.0
14	0.2	0.70	0.15	0.15	0.3	0.56	68.0	75.0	0.30	0.0
15	0.1	0.70	0.15	0.15	0.3	0.56	68.0	75.0	0.30	0.0
16	0.1	0.60	0.30	0.10	0.2	0.47	68.0	75.0	0.30	0.0
17	0.1	0.50	0.10	0.10	0.2	0.37	68.0	75.0	0.30	0.0
18	0.0	0.30	0.10	0.10	0.0	0.37	55.0	75.0	0.10	0.0
19	0.0	0.20	0.05	0.05	0.0	0.28	55.0	75.0	0.10	1.0
20	0.0	0.10	0.05	0.05	0.0	0.28	55.0	75.0	0.10	1.0
21	0.0	0.10	0.05	0.05	0.0	0.28	55.0	75.0	0.10	1.0
22	0.0	0.10	0.05	0.05	0.0	0.23	55.0	75.0	0.10	1.0
23	0.0	0.10	0.05	0.05	0.0	0.19	55.0	75.0	0.10	1.0

SCH.2 SAT

	2	3	4	5	6	7	8	9	10	11
	Occup.	Lighting	OFF Eq.	OTH Eq.	Exhaust	FANS	Heating	Cooling	Out Eq.	OL
0	0.0	0.10	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
1	0.0	0.10	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
2	0.0	0.10	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
3	0.0	0.10	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
4	0.0	0.10	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
5	0.0	0.10	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
6	0.0	0.10	0.05	0.05	0.0	0.20	58.0	75.0	0.10	0.2
7	0.0	0.10	0.05	0.10	0.0	0.30	60.0	75.0	0.10	0.0
8	0.0	0.20	0.05	0.10	0.0	0.40	68.0	75.0	0.10	0.0
9	0.1	0.40	0.10	0.10	0.2	0.60	68.0	75.0	0.20	0.0
10	0.2	0.70	0.10	0.20	0.2	0.80	68.0	75.0	0.30	0.0
11	0.3	1.00	0.10	0.20	0.3	0.90	68.0	75.0	0.30	0.0
12	0.8	1.00	0.10	0.30	0.3	1.00	68.0	75.0	0.30	0.0
13	0.8	1.00	0.10	0.30	0.6	1.00	68.0	75.0	0.30	0.0
14	0.8	1.00	0.10	0.30	0.6	1.00	68.0	75.0	0.30	0.0
15	0.8	1.00	0.10	0.30	0.6	1.00	68.0	75.0	0.30	0.0
16	0.7	1.00	0.10	0.30	0.6	1.00	68.0	75.0	0.30	0.0
17	0.6	1.00	0.05	0.20	0.5	0.80	68.0	75.0	0.30	0.0
18	0.5	0.70	0.05	0.10	0.4	0.60	55.0	75.0	0.10	0.0
19	0.2	0.50	0.05	0.10	0.2	0.40	55.0	75.0	0.10	1.0
20	0.1	0.30	0.05	0.05	0.2	0.30	55.0	75.0	0.10	1.0
21	0.0	0.10	0.05	0.05	0.0	0.25	55.0	75.0	0.10	1.0
22	0.0	0.10	0.05	0.05	0.0	0.20	55.0	75.0	0.10	1.0
23	0.0	0.10	0.05	0.05	0.0	0.20	55.0	75.0	0.10	1.0

SCH.3 SUN & HOL

	2	3	4	5	6	7	8	9	10	11
	Occup.	Lighting	OFF Eq.	OTH Eq.	Exhaust	FANS	Heating	Cooling	Out Eq.	OL
0	0.0	0.08	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
1	0.0	0.08	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
2	0.0	0.08	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
3	0.0	0.08	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
4	0.0	0.08	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
5	0.0	0.08	0.05	0.05	0.0	0.15	55.0	75.0	0.10	0.2
6	0.0	0.08	0.05	0.05	0.0	0.25	55.0	75.0	0.10	0.2
7	0.0	0.08	0.05	0.05	0.0	0.40	55.0	75.0	0.10	0.0
8	0.0	0.08	0.05	0.05	0.0	0.40	55.0	75.0	0.10	0.0
9	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
10	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
11	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
12	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
13	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
14	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
15	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
16	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
17	0.0	0.08	0.05	0.05	0.0	0.40	68.0	75.0	0.10	0.0
18	0.0	0.08	0.05	0.05	0.0	0.30	55.0	75.0	0.10	0.0
19	0.0	0.08	0.05	0.05	0.0	0.25	55.0	75.0	0.10	1.0
20	0.0	0.08	0.05	0.05	0.0	0.20	55.0	75.0	0.10	1.0
21	0.0	0.08	0.05	0.05	0.0	0.20	55.0	75.0	0.10	1.0
22	0.0	0.08	0.05	0.05	0.0	0.20	55.0	75.0	0.10	1.0
23	0.0	0.08	0.05	0.05	0.0	0.15	55.0	75.0	0.10	1.0

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

BECalc - CALCULATIONS Internal Loads

FAWN Sta Ft Laud.

						Day of	Holi day	Sch	Internal: Occupancy			Lighting		Office Equip		OTH Equip		Walls		Win	Floor	Roof		FANS			OA	INF	OA & INF		Internal Loads		
Date	Time	T avg (F)	DewPt avg	RH avg %	WB (F)	Wk	(H)	#	%	HS BTU	HL BTU	%	HS kW	%	HS kW	%	HS kW	Ts	HS BTU	HS BTU	HS BTU	Ts	HS BTU	%	CFM	kW	CFM	CFM	HS BTU	HL BTU	HS kW	HL kW	H kW
1/1/2015	0	71	56.5	51.6	62	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.04	0.184	71.0	-3098	1517	570	71.0	-2350	0.1	1148	0.4	115	34.44	2579	710	1.2	0.2	1.4
1/1/2015	1	71	58.4	56.5	63	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.04	0.184	71.0	-3098	1441	570	71.0	-2350	0.1	1148	0.4	115	34.44	2579	812	1.1	0.2	1.4
1/1/2015	2	70	58.9	60.5	63	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.04	0.184	70.0	-3872	1205	570	70.0	-2938	0.1	1148	0.4	115	34.44	2418	812	0.6	0.2	0.9
1/1/2015	3	70	60.7	65.8	64	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.04	0.184	70.0	-3872	1132	570	70.0	-2938	0.1	1148	0.4	115	34.44	2418	913	0.6	0.3	0.9
1/1/2015	4	70	60.7	65.8	64	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.04	0.184	70.0	-3872	1057	570	70.0	-2938	0.1	1148	0.4	115	34.44	2418	913	0.6	0.3	0.8
1/1/2015	5	70	60.7	65.8	64	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.04	0.184	70.0	-3872	952	570	70.0	-2938	0.1	1148	0.4	115	34.44	2418	913	0.5	0.3	0.8
1/1/2015	6	70	60.7	65.8	64	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.04	0.184	70.0	-3872	880	570	70.0	-2938	0.2	1531	0.6	153	45.92	3224	1218	0.9	0.4	1.3
1/1/2015	7	72	61.2	61.7	65	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.07	0.322	72.0	-2323	1985	570	72.0	-1763	0.2	1531	0.6	153	45.92	3654	1353	2.3	0.4	2.7
1/1/2015	8	74	61.9	58.6	66	5	0	1	0.1	2150	1850	0.1	0.637	0.05	0.113	0.1	0.46	77.7	2091	6203	570	102.1	15934	0.3	2296	0.9	230	68.89	6125	2233	11.8	1.2	13.0
1/1/2015	9	76	62.4	55.0	67	5	0	1	0.1	2150	1850	0.5	3.187	0.1	0.225	0.1	0.46	79.8	3717	9291	570	104.9	17555	0.4	3062	1.2	306	91.85	9027	3248	17.5	1.5	19.0
1/1/2015	10	75	62.9	58.6	67	5	0	1	0.1	2150	1850	0.5	3.187	0.15	0.338	0.1	0.46	78.8	2904	9121	570	103.5	16744	0.5	3827	1.5	383	114.8	10746	4060	17.8	1.7	19.6
1/1/2015	11	75	63.1	59.2	67	5	0	1	0.1	2150	1850	0.6	3.824	0.15	0.338	0.1	0.46	78.8	2904	8649	570	103.5	16744	0.5	3827	1.5	383	114.8	10746	4060	18.3	1.7	20.1
1/1/2015	12	74	65.0	67.4	68	5	0	1	0.2	4300	3700	0.6	3.824	0.15	0.338	0.1	0.46	77.7	2091	5953	570	102.1	15934	0.5	3827	1.5	383	114.8	10209	4398	17.6	2.4	19.9
1/1/2015	13	74	65.0	67.4	68	5	0	1	0.2	4300	3700	0.7	4.462	0.15	0.338	0.15	0.69	77.7	2091	7045	570	102.1	15934	0.6	4592	1.8	459	137.8	12251	5278	19.6	2.6	22.3
1/1/2015	14	74	63.5	62.8	67	5	0	1	0.2	4300	3700	0.7	4.462	0.15	0.338	0.15	0.69	77.7	2091	8573	570	102.1	15934	0.6	4592	1.8	459	137.8	12251	4872	20.1	2.5	22.6
1/1/2015	15	74	63.5	62.8	67	5	0	1	0.1	2150	1850	0.7	4.462	0.15	0.338	0.15	0.69	77.7	2091	8329	570	102.1	15934	0.6	4592	1.8	459	137.8	12251	4872	19.4	2.0	21.4
1/1/2015	16	73	62.3	62.2	66	5	0	1	0.1	2150	1850	0.6	3.824	0.3	0.675	0.1	0.46	76.7	1278	6341	570	100.7	15123	0.5	3827	1.5	383	114.8	9671	3721	16.7	1.6	18.4
1/1/2015	17	72	61.1	61.5	65	5	0	1	0.1	2150	1850	0.5	3.187	0.1	0.225	0.1	0.46	75.6	465	4055	570	99.4	14312	0.4	3062	1.2	306	91.85	7307	2706	13.5	1.3	14.9
1/1/2015	18	71	60.1	61.3	64	5	0	1	0	0	0	0.3	1.912	0.1	0.225	0.1	0.46	71.0	-3098	2856	570	71.0	-2350	0.4	3062	1.2	306	91.85	6877	2436	5.2	0.7	5.9
1/1/2015	19	71	60.1	61.3	64	5	0	1	0	0	0	0.2	1.275	0.05	0.113	0.05	0.23	71.0	-3098	2405	570	71.0	-2350	0.3	2296	0.9	230	68.89	5158	1827	3.3	0.5	3.8
1/1/2015	20	71	60.1	61.3	64	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.05	0.23	71.0	-3098	2148	570	71.0	-2350	0.3	2296	0.9	230	68.89	5158	1827	2.6	0.5	3.1
1/1/2015	21	71	58.3	56.3	63	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.05	0.23	71.0	-3098	1971	570	71.0	-2350	0.3	2296	0.9	230	68.89	5158	1624	2.5	0.5	3.0
1/1/2015	22	71	58.3	56.3	63	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.05	0.23	71.0	-3098	1779	570	71.0	-2350	0.2	1913	0.7	191	57.4	4298	1353	2.1	0.4	2.5
1/1/2015	23	70	58.8	60.3	63	5	0	1	0	0	0	0.1	0.637	0.05	0.113	0.05	0.23	70.0	-3872	1483	570	70.0	-2938	0.2	1531	0.6	153	45.92	3224	1083	1.1	0.3	1.4

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

BECalc - CALCULATIONS Internal Loads

FAWN Sta Ft Laud.

		External: Exhaust			Out Equip.		OL Lighting		Heat=1 Cool=0	Indoor	Heating				Cooling					Max 32.1 Demand
Date	Time	%	CFM	kW	%	kW	%	HS kW	H / C	Temp	Temp	Heat (BTUH)	kW	kW	Temp	HT (Btu/hr)	Tons	kW	Month	kW
1/6/2015	0	0	0	0.0	0.1	0.17	0.2	0.13	1	55	55	-	-	-	75	-	-	0.0	1	1.7
1/6/2015	1	0	0	0.0	0.1	0.17	0.2	0.13	1	55	55	-	-	-	75	-	-	0.0	1	1.7
1/6/2015	2	0	0	0.0	0.1	0.17	0.2	0.13	1	55	55	-	-	-	75	-	-	0.0	1	1.7
1/6/2015	3	0	0	0.0	0.1	0.17	0.2	0.13	1	59	55	-	-	-	75	-	-	0.0	1	1.7
1/6/2015	4	0	0	0.0	0.1	0.17	0.2	0.13	1	55	55	-	-	-	75	-	-	0.0	1	1.7
1/6/2015	5	0	0	0.0	0.1	0.17	0.2	0.13	1	55	55	-	-	-	75	-	-	0.0	1	1.7
1/6/2015	6	0	0	0.0	0.1	0.17	0.2	0.13	1	58	58	5,389	1.6	1.6	75	-	-	0.0	1	3.4
1/6/2015	7	0	0	0.0	0.1	0.17	0	0	1	60	60	230	0.1	0.1	75	-	-	0.0	1	1.9
1/6/2015	8	0.2	125	0.1	0.1	0.17	0	0	1	68	68	19,314	5.7	5.7	75	-	-	0.0	1	8.0
1/6/2015	9	0.2	125	0.1	0.2	0.33	0	0	0	75	68	-	-	-	75	32,650	2.72	3.4	1	8.9
1/6/2015	10	0.2	125	0.1	0.3	0.5	0	0	0	75	68	-	-	-	75	45,120	3.76	4.7	1	10.7
1/6/2015	11	0.3	187.5	0.1	0.3	0.5	0	0	0	75	68	-	-	-	75	58,383	4.87	6.1	1	12.8
1/6/2015	12	0.3	187.5	0.1	0.3	0.5	0	0	0	75	68	-	-	-	75	69,593	5.80	7.2	1	14.0
1/6/2015	13	0.3	187.5	0.1	0.3	0.5	0	0	0	75	68	-	-	-	75	74,059	6.17	7.7	1	15.6
1/6/2015	14	0.3	187.5	0.1	0.3	0.5	0	0	0	75	68	-	-	-	75	71,776	5.98	7.5	1	15.4
1/6/2015	15	0.3	187.5	0.1	0.3	0.5	0	0	0	75	68	-	-	-	75	64,723	5.39	6.7	1	14.6
1/6/2015	16	0.2	125	0.1	0.3	0.5	0	0	0	75	68	-	-	-	75	47,396	3.95	4.9	1	12.0
1/6/2015	17	0.2	125	0.1	0.3	0.5	0	0	0	75	68	-	-	-	75	31,697	2.64	3.3	1	8.9
1/6/2015	18	0	0	0.0	0.1	0.17	0	0	1	63	55	-	-	-	75	-	-	0.0	1	4.0
1/6/2015	19	0	0	0.0	0.1	0.17	1	0.67	1	62	55	-	-	-	75	-	-	0.0	1	3.3
1/6/2015	20	0	0	0.0	0.1	0.17	1	0.67	1	60	55	-	-	-	75	-	-	0.0	1	2.7
1/6/2015	21	0	0	0.0	0.1	0.17	1	0.67	1	59	55	-	-	-	75	-	-	0.0	1	2.7
1/6/2015	22	0	0	0.0	0.1	0.17	1	0.67	1	60	55	-	-	-	75	-	-	0.0	1	2.6
1/6/2015	23	0	0	0.0	0.1	0.17	1	0.67	1	60	55	-	-	-	75	-	-	0.0	1	2.4

Broward County

Broward County - RFP No: R1243101PI –
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An ENGIE company

Calculated Energy Use and Demand:

Electrical Loads/Use:

	Lighting kWh	Equip kWh	OTH Eq. kWh	Exhaust kWh	Fans kWh	Out Eq. kWh	OL kWh	Heating kWh	Cooling kWh
	22.9%	2.0%	4.4%	0.5%	12.1%	2.9%	1.9%	1.3%	51.9%
Jan	1,659	140	324	40	876	210	132	438	2,297
Feb	1,474	128	286	35	777	189	120	367	2,172
Mar	1,611	143	312	38	848	210	132	18	2,936
Apr	1,565	138	303	37	824	203	128	5	3,222
May	1,659	140	324	40	876	210	132	0	3,868
Jun	1,565	138	303	37	824	203	128	0	4,438
Jul	1,635	141	318	39	862	210	132	0	4,942
Aug	1,635	141	318	39	862	210	132	0	5,136
Sep	1,565	138	303	37	824	203	128	0	4,558
Oct	1,659	140	324	40	876	210	132	2	4,116
Nov	1,565	138	303	37	824	203	128	37	3,226
Dec	1,554	142	303	36	832	207	132	226	2,502
	19,146	**1,665**	**3,719**	**455**	**10,103**	**2,466**	**1,558**	**1,093**	**43,413**
	3,004							Full load hours	3,876
								Total Electric	**83,619**

Envelope Loads:

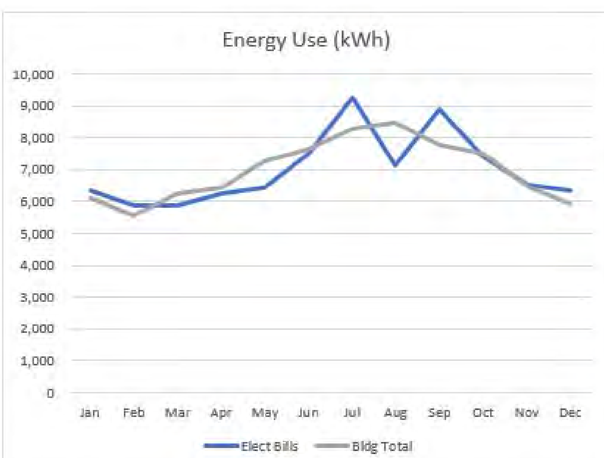
	Walls (kWh)	Win (kWh)	Floor (kWh)	Roof (kWh)
	5.3%	17.4%	5.9%	23.5%
Jan	-682	720	124	719
Feb	-540	763	4	725
Mar	-220	1,146	-6	1,175
Apr	110	1,204	49	1,417
May	475	1,354	280	1,766
Jun	1,117	1,476	493	2,275
Jul	1,354	1,609	708	2,527
Aug	1,520	1,653	834	2,667
Sep	1,097	1,458	818	2,257
Oct	548	1,336	743	1,831
Nov	56	1,034	532	1,353
Dec	-390	818	328	976
	4,446	**14,569**	**4,908**	**19,689**

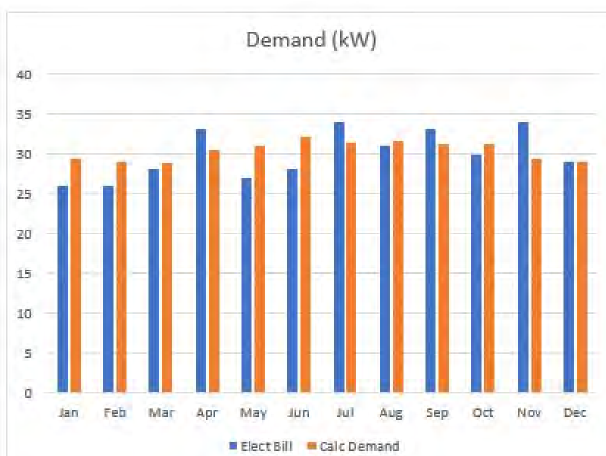
Demand:

Month	Demand kW
Jan	29.3
Feb	28.9
Mar	28.7
Apr	30.5
May	31.0
Jun	32.1
Jul	31.5
Aug	31.6
Sep	31.2
Oct	31.3
Nov	29.3
Dec	28.9

A Building or Area - Calculated Energy Use:

End-Use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Lighting	1,659	1,474	1,611	1,565	1,659	1,565	1,635	1,635	1,565	1,659	1,565	1,554	19,146	22.9%
OFF Equip.	140	128	143	138	140	138	141	141	138	140	138	142	1,665	2.0%
OTH Equip.	324	286	312	303	324	303	318	318	303	324	303	303	3,719	4.4%
Exhaust	40	35	38	37	40	37	39	39	37	40	37	36	455	0.5%
FANS	876	777	848	824	876	824	862	862	824	876	824	832	10,103	12.1%
Heating	438	367	18	5	0	0	0	0	0	2	37	226	1,093	1.3%
Cooling	2,297	2,172	2,936	3,222	3,868	4,438	4,942	5,136	4,558	4,116	3,226	2,502	43,413	51.9%
Out Equip.	210	189	210	203	210	203	210	210	203	210	203	207	2,466	2.9%
Out Lights	132	120	132	128	132	128	132	132	128	132	128	132	1,558	1.9%
Total (kWh)	6,115	5,548	6,247	6,425	7,248	7,636	8,279	8,472	7,756	7,497	6,461	5,934	**83,619**	Calc.
Demand	**29.3**	**28.9**	**28.7**	**30.5**	**31.0**	**32.1**	**31.5**	**31.6**	**31.2**	**31.3**	**29.3**	**28.9**		$/kWh
Cost ($)	728	690	729	760	815	850	880	894	846	832	748	713	**9,484**	0.1134





Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Utility Information:

Electric Data: (Billed) Rate: GSD-1

U	2016	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Calc.
	kWh	6,330	5,880	5,880	6,240	6,450	7,500	9,270	7,140	8,880	7,410	6,540	6,330	83,850	
	kW	26	26	28	33	27	28	34	31	33	30	34	29	29.9	$/kWh
	$	668	643	669	737	688	754	926	768	885	767	768	699	8,972	0.1070

Model Energy Use & Demand	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT/ Max
Demand (kW)	29.3	28.9	28.7	30.5	31.0	32.1	31.5	31.6	31.2	31.3	29.3	28.9	32.1
Energy Use (kWh)	6,115	5,548	6,247	6,425	7,248	7,636	8,279	8,472	7,756	7,497	6,461	5,934	83,619

GSD-1													
Demand (kW)	29	29	29	31	31	32	31	32	31	31	29	29	32.1
Energy Use (kWh)	6,115	5,548	6,247	6,425	7,248	7,636	8,279	8,472	7,756	7,497	6,461	5,934	83,619
Customer Charge ($)	25	25	25	25	25	25	25	25	25	25	25	25	25
Energy Charge ($)	329	298	336	345	390	410	445	455	417	403	347	319	0.0538
Demand Charge ($)	311	306	305	324	329	341	333	335	330	331	310	306	10.6
Storm Charge ($)	5	5	5	5	6	6	6	6	6	6	5	5	0.78%
Tax	17	16	17	18	19	20	21	21	20	20	18	17	2.56%
Franchise & Tax	41	39	41	43	46	48	50	51	48	47	42	40	6.00%
Monthly Charges ($)	**728**	**690**	**729**	**760**	**815**	**850**	**880**	**894**	**846**	**832**	**748**	**713**	**9,484**

Summary of Mechanical Savings Calculations with Spreadsheets

ID	Site	#	ECM	Lighting (kWh)	Equip (kWh)	OTH Eq. (kWh)	Exhaust (kWh)	Fans (kWh)	Out Eq. (kWh)	OL (kWh)	Heating (kWh)	Cooling (kWh)	Total (kWh)	Savings (kWh)
BP8	FERN FOREST	0	Basecase	19,146	1,628	3,288	455	10,568	2,167	1,558	1,096	43,933	83,839	0
		3	AC replace	10,342	1,628	3,288	455	10,103	2,167	1,558	961	32,212	62,714	6,362
BP2	TY Park Office	0	Basecase	15,455	4,211	2,248	974	12,313	2,604	7,008	1,044	42,571	88,428	0
		3	AC replace	7,028	4,211	2,248	974	12,313	2,604	7,008	873	31,900	69,160	6,428
BP2	TY Maintenance	0	Basecase	8,918	1,418	901	203	2,190	497	624	394	14,057	29,202	0
		3	AC replace	4,055	1,418	901	203	1,956	497	624	353	10,628	20,634	1,521
BP2	TY Campground Bldg.	0	Basecase	4,642	263	13,437	158	1,916	46,218	1,248	452	19,470	87,804	0
		3	AC replace	2,115	263	13,437	158	1,676	46,218	1,248	447	16,334	81,897	2,338
BP5	LONG KEY	0	Basecase	47,369	3,971	7,809	1,578	28,668	8,629	13,009	2,213	143,305	256,552	0
		3	AC replace	18,786	3,971	7,809	1,578	28,668	8,629	13,009	1,979	113,998	198,427	17,160
BP6	WEST LAKE / Anne Kolb NC	0	Basecase	12,023	6,541	2,676	594	14,530	3,868	19,814	1,152	42,185	103,382	0
	Visitor Center	3	AC replace	4,529	6,541	2,676	594	14,530	3,868	19,814	1,002	35,710	89,264	17,866
		4	Duct Repair	4,529	6,541	2,676	594	14,530	3,868	19,814	1,002	35,364	88,918	346
		5	Arrestors	4,529	6,541	2,676	594	14,530	3,868	19,814	1,002	35,364	88,918	0
BP6	WEST LAKE / Anne Kolb NC	0	Basecase	8,592	2,092	2,605	722	5,062	2,035	1,814	622	30,817	54,361	0
	Marina	3	AC replace	2,920	2,092	2,605	722	5,062	2,035	1,814	558	19,725	37,534	8,061
BP6	WEST LAKE / Anne Kolb NC	0	Basecase	15	0	2,409	0	1,124	0	0	0	2,915	6,463	0
	Pump room	1	AC replace	15	0	2,409	0	1,124	0	0	0	2,223	5,770	693

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Broward County
Energy Savings Performance Contract
Whole Building Energy Model

African American Library

MODEL CALIBRATION	Electric kWh	Nat. Gas Therms
Baseline	1,683,840	0
eQUEST Model	1,636,789	0
Error	-2.8%	#DIV/0!

BASELINE MODEL

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	130,050	119,305	133,811	132,394	136,781	141,626	146,127	151,134	142,247	141,907	131,126	130,260	1,636,789
MAX KW	323.8	322.5	313.5	348.7	342.9	368.6	394.2	383.2	397.1	380.2	330.8	336	394.2
DAY/HR	23/14	27/14	42813	24/14	42961	42869	43022	21/14	42830	42780	29/19	15/19	42926
EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

ECM - Lighting Savings

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
KWH	111,741	103,408	115,914	114,653	120,184	125,407	129,532	131,822	124,010	122,725	112,885	111,725	1,423,807		
MAX KW	291.9	290.3	284.8	317.2	311.4	337	362.4	351.2	355.2	332.7	285.9	289.1	362.4		
DAY/HR	23/14	27/14	42810	24/14	42961	42869	43022	21/14	42839	42780	29/16	15/18	42926		
EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0		
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0		
SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	18,309	15,897	17,897	17,741	16,597	16,219	16,595	19,312	18,237	19,182	18,441	18,535	212,982	12.6%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	31.90	32.20	28.70	31.50	31.50	31.60	31.80	32.00	31.90	33.60	45.90	46.90	31.80	34.04	Avg Monthly kW Savings

ECM - Optimize HVAC Sch (Existing)

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
KWH	88,135	82,109	94,024	93,930	97,639	101,919	106,132	108,105	100,989	99,973	91,029	89,224	1,153,189		
MAX KW	271.9	268	257.3	293.9	288.8	312	338.2	326.8	330.6	311.7	266	263.9	338.2		
DAY/HR	23/14	27/14	42810	24/14	23/14	42869	43022	21/14	42839	42780	23/17	15/18	42926		
EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0		
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0		
SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	23,606	21,299	21,890	20,723	22,545	23,488	23,400	23,717	23,041	22,752	21,656	22,501	270,618	16.1%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	20.00	22.30	27.50	23.30	22.60	25.00	24.30	24.40	24.60	21.00	19.90	25.20	24.20	23.33	Avg Monthly kW Savings

ECM - Energy Eff Upgrades (Optimize DX Systems)

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
KWH	67,920	64,007	77,636	80,933	87,467	96,570	101,802	104,583	96,169	92,077	77,936	71,327	1,019,443		
MAX KW	258.1	260.6	250.6	282.6	278.6	296.6	319.5	309.6	312.7	298.8	258.4	257.4	319.5		
DAY/HR	23/14	27/14	42810	24/14	29/14	42869	43022	21/14	42839	42780	29/18	15/18	42926		
EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0		
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0		
SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	20,207	17,302	16,188	12,997	10,172	5,341	4,330	3,522	4,080	7,096	13,083	17,897	135,746	7.9%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	13.80	7.40	6.70	11.30	10.20	15.40	18.70	17.20	17.90	14.90	7.60	6.50	18.70	12.30	Avg Monthly kW Savings

ECM - BAS System Checkout

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
KWH	87,440	84,303	77,172	80,448	87,054	96,271	101,374	104,131	95,024	91,555	77,609	70,981	1,014,242		
MAX KW	255.3	258.2	248.5	279.8	275.9	293.5	316.3	306.5	309.4	294	256	255.2	316.3		
DAY/HR	23/14	27/14	42810	24/14	29/14	42869	43022	21/14	42839	42780	29/18	15/18	42926		
EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0		
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0		
SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	488	438	664	485	413	307	428	452	345	522	327	346	5,201	0.3%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	2.80	2.40	2.10	2.80	2.70	3.10	3.20	3.10	3.30	2.80	2.40	2.20	3.20	2.74	Avg Monthly kW Savings

ECM - Variable Flow CHW Puping

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
KWH	61,588	58,763	69,997	72,337	77,228	84,532	88,679	91,208	83,890	80,758	69,446	64,313	902,738		
MAX KW	239.5	242.4	232.4	284.2	280.1	278.2	301.2	291.2	294.6	278.5	240.1	239.3	301.2		
DAY/HR	23/14	27/14	42810	24/14	29/14	43069	43022	21/14	42839	42780	29/18	15/18	42926		
EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0		
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0		
SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	5,852	5,620	7,175	8,111	9,825	11,739	12,695	12,923	11,934	10,797	8,164	6,868	111,504	6.6%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	15.80	15.80	16.10	15.60	15.80	15.30	15.10	15.30	14.90	15.50	15.90	15.90	15.10	15.58	Avg Monthly kW Savings

ECM - CHW Pump Replacement

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
KWH	61,549	58,726	69,949	72,284	77,165	84,457	88,598	91,125	83,813	80,689	69,381	64,270	902,015		
MAX KW	239.3	242.2	232.3	264	280	278.1	301	291	294.3	278.4	240	239.1	301		
DAY/HR	23/14	27/14	42810	24/14	29/14	42869	43022	21/14	42939	42780	29/19	15/18	42926		
FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
THERM															
MAX THERM/HR															
DAY/HR															
SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	39	37	49	53	64	75	81	83	77	69	54	43	723	0.0%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0	
KW SAVINGS	0.20	0.20	0.10	0.20	0.10	0.10	0.20	0.20	0.20	0.10	0.10	0.20	0.20	0.16	Avg Monthly kW Savings

ECM - CHW Coil Cleaning

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
KWH	60,852	58,112	69,107	71,369	76,173	83,331	87,422	89,899	82,689	79,653	68,521	63,524	890,693		
MAX KW	237.1	239.7	229.7	261.5	257.4	275.6	290.4	280.4	291.7	275.8	237.5	236.6	290.4		
DAY/HR	23/14	27/14	42810	24/14	29/14	42869	43022	21/14	42838	42780	29/16	15/18	42926		
FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
THERM															
MAX THERM/HR															
DAY/HR															
SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	697	613	842	865	992	1,126	1,176	1,226	1,124	1,036	860	746	11,322	0.7%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0	
KW SAVINGS	2.20	2.50	2.60	2.50	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.50	2.60	2.53	Avg Monthly kW Savings

ECM - Install New OA Damper

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
KWH	60,552	57,782	68,628	70,809	75,393	82,077	85,973	88,438	81,363	78,735	67,898	63,150	880,797		
MAX KW	234.4	236.9	227.7	257.7	264	270.6	292.8	283	285.7	271.1	233.9	233.1	292.8		
DAY/HR	23/14	27/14	20/14	24/14	29/14	42869	43022	21/14	42939	42780	29/19	15/19	42926		
FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN		
THERM															
MAX THERM/HR															
DAY/HR															
SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	300	331	478	590	780	1,254	1,449	1,461	1,326	918	633	374	9,898	0.6%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0	
KW SAVINGS	2.70	2.80	2.80	3.80	3.40	5.00	5.80	5.40	6.00	4.70	3.60	3.50	5.80	4.06	Avg Monthly kW Savings

Split System - Savings Summary

Facility	Carver Ranches Library
Unit Location	AHU-1

Existing Conditions

Mfg	Trane Split System
Model #	MCCB030UA0A0UB
Date Mfg	2005

Baseline Data

Peak kW	101
kWh	300,600

Proposed Conditions

Mfg	TBD
Model #	TBD

Energy Usage

Existing Conditions	00-08 Hrs	42.0	kW	22,241	kWh	0	Therms
	09-16 Hrs	42.0	kW	40,956	kWh	0	Therms
	17-00 Hrs	42.0	kW	32,237	kWh	0	Therms
	Total	**42.0**	**kW**	**95,434**	**kWh**	**0**	**Therms**
		41.5%		*31.7%*			

Proposed Conditions	00-08 Hrs	38.9	kW	17,231	kWh	0	Therms
	09-16 Hrs	38.9	kW	35,255	kWh	0	Therms
	17-00 Hrs	38.9	kW	26,612	kWh	0	Therms
	Total	**38.9**	**kW**	**79,098**	**kWh**	**0**	**Therms**
		38.5%		*26.3%*			

Total Annual Energy Savings	**3.1**	**kW**
	16,336	**kWh**
	0	**Therms**

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	Carver Ranches Library
Unit Location	AHU-1
Mfg	Trane Split System
Model #	MCCB030UA0A0UB

***RED TEXT IS INPUT*

Estimated SF Served by Unit	10500	SF	
Max Cooling Load	315.0	kbtu/hr	400SF/Ton
Max Heating Load	131.3	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	72	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	12,600.0	btu/h-degF	
Tbal - Cooling	71.5	deg-F	
Ktot - Heating	4375.0	btu/h-degF	
Tbal - Heating	68.5	deg-F	
DX Cooling System	35	tons	
	420	kbtu/hr	
	10.01	New EER/SEER/IPLV	
	1.199	kW/Ton	
	12	Age of Unit (yrs)	
	44.55	Full Load kW (degraded 0.5% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	12	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	133.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
AHU-1	Library	Trane Split System	CCB030UA0A0U	2006	10.01	1.00

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	30.5	0	384.7	393.8	1.000	393.8	44.55	0.98	0
97	25.5	0	321.7	410.1	1.000	410.1	44.55	0.78	0
92	20.5	0	258.7	426.5	1.000	426.5	44.55	0.61	0
87	15.5	54	195.7	442.9	1.000	442.9	44.55	0.44	1,063
82	10.5	643	132.7	459.3	1.000	459.3	44.55	0.29	8,274
77	5.5	869	69.7	475.7	1.000	475.7	44.55	0.15	5,670
72	0.5	624	6.7	492.0	1.000	492.0	44.55	0.01	377
		2,190							15,383

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.5	165	-28.3	0.0	1.000	0.0	0.00	-2,415.46	0	-28.35	-8.31	1,370
57	11.5	123	-50.2	0.0	1.000	0.0	0.00	-4,515.14	0	-50.22	-14.71	1,810
52	16.5	80	-72.1	0.0	1.000	0.0	0.00	-6,858.55	0	-72.09	-21.12	1,690
47	21.5	43	-94.0	0.0	1.000	0.0	0.00	-9,490.74	0	-93.97	-27.53	1,184
42	26.5	15	-115.8	0.0	1.000	0.0	0.00	-12,468.60	0	-115.84	-33.94	509
37	31.5	5	-137.7	0.0	1.000	0.0	0.00	-15,865.02	0	-137.72	-40.35	202
32	36.5	2	-159.6	0.0	1.000	0.0	0.00	-19,774.89	0	-159.59	-46.76	94
27	41.5	0	-181.5	0.0	1.000	0.0	0.00	-24,324.17	0	-181.47	-53.17	0
22	46.5	0	-203.3	0.0	1.000	0.0	0.00	-29,683.70	0	-203.34	-59.58	0
17	51.5	0	-225.2	0.0	1.000	0.0	0.00	-36,091.08	0	-225.21	-65.99	0
12	56.5	0	-247.1	0.0	1.000	0.0	0.00	-43,886.92	0	-247.09	-72.40	0
		433							0			6,858

Total Cooling kW Demand	42.0	kW
Total Cooling kWh Consumption	15,383	kWh
Total Heating kWh Consumption	6,858	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	Carver Ranches Library
Unit Location	AHU-1
Mfg	Trane Split System
Model #	MCCB030UA0A0UB

*RED TEXT IS INPUT

Estimated SF Served by Unit	10500	SF	
Max Cooling Load	315.0	kbtu/hr	400SF/Ton
Max Heating Load	420.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	72	deg F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	12,600.0	btu/h-degF	
Tbal - Cooling	71.5	deg F	
Ktot - Heating	-14000.0	btu/h-degF	
Tbal - Heating	69.5	deg F	
DX Cooling System	35	tons	
	420	kbtu/hr	
	10.01	New EER/SEER/IPLV	
	1.199	kW/Ton	
	12	Age of Unit (yrs)	
	44.66	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	12	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	139	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	30.5	0	384.7	393.8	1.000	393.8	44.55	0.98	0.00	0
97	25.5	5	321.7	410.1	1.000	410.1	44.55	0.78	1.61	175
92	20.5	174	258.7	426.5	1.000	426.5	44.55	0.61	45.01	4,701
87	15.5	787	195.7	442.9	1.000	442.9	44.55	0.44	153.99	15,488
82	10.5	816	132.7	459.3	1.000	459.3	44.55	0.29	108.26	10,500
77	5.5	609	69.7	475.7	1.000	475.7	44.55	0.15	42.43	3,973
72	0.5	278	6.7	492.0	1.000	492.0	44.55	0.01	1.85	168
		2,669							353.14	35,005

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.5	70	-105.3	0.0	1.000	0.0	0.00	-8,979.82	-73.73	0	-105.35	-30.87	2,161
57	12.5	34	-175.3	0.0	1.000	0.0	0.00	-15,767.39	-5.96	0	-175.34	-51.38	1,747
52	17.5	17	-245.3	0.0	1.000	0.0	0.00	-23,342.85	-4.17	0	-245.34	-71.89	1,222
47	22.5	5	-315.3	0.0	1.000	0.0	0.00	-31,851.85	-1.58	0	-315.34	-92.40	462
42	27.5	2	-385.3	0.0	1.000	0.0	0.00	-41,478.29	-0.77	0	-385.34	-112.91	226
37	32.5	1	-455.3	0.0	1.000	0.0	0.00	-52,457.76	-0.46	0	-455.34	-133.42	133
32	37.5	0	-525.3	0.0	1.000	0.0	0.00	-65,097.07	0.00	0	-525.34	-153.93	0
27	42.5	0	-595.3	0.0	1.000	0.0	0.00	-79,803.40	0.00	0	-595.34	-174.43	0
22	47.5	0	-665.3	0.0	1.000	0.0	0.00	-97,128.95	0.00	0	-665.34	-194.94	0
17	52.5	0	-735.3	0.0	1.000	0.0	0.00	-117,841.88	0.00	0	-735.34	-215.45	0
12	57.5	0	-805.3	0.0	1.000	0.0	0.00	-143,043.22	0.00	0	-805.34	-235.96	0
		129								0			5,951

Total Cooling kW Demand	42.0	kW
Total Cooling kWh Consumption	35,005	kWh
Total Heating kWh Consumption	5,951	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	Carver Ranches Library
Unit Location	AHU-1
Mfg	Trane Split System
Model #	MCCB030JA0A00B

RED TEXT IS INPUT

Estimated SF Served by Unit	10500	SF	
Max Cooling Load	315.0	kbtu/hr	400SF/Ton
Max Heating Load	420.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	72	deg F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	12,600.0	btu/h-degF	
Tbal - Cooling	71.5	deg F	
Ktot - Heating	-14000.0	btu/h-degF	
Tbal - Heating	69.5	deg F	
DX Cooling System	35	tons	
	420	kbtu/hr	
	10.01	New EER/SEER/IPLV	
	1.199	kW/Ton	
	12	Age of Unit (yrs)	
	44.56	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	12	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	133	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	30.5	0	384.7	393.8	1.000	393.8	44.55	0.98	0.00	0
97	25.5	1	321.7	410.1	1.000	410.1	44.55	0.78	0.32	35
92	20.5	11	258.7	426.5	1.000	426.5	44.55	0.61	2.85	297
87	15.5	275	195.7	442.9	1.000	442.9	44.55	0.44	53.81	6,412
82	10.5	821	132.7	459.3	1.000	459.3	44.55	0.29	108.92	10,564
77	5.5	862	69.7	475.7	1.000	475.7	44.55	0.15	60.05	5,624
72	0.5	539	6.7	492.0	1.000	492.0	44.55	0.01	3.59	325
		2,509							229.54	22,258

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.5	106	-105.3	0.0	1.000	0.0	0.00	-8,979.82	-11.17	0	-105.35	-30.87	3,272
57	12.5	60	-175.3	0.0	1.000	0.0	0.00	-15,767.39	-10.52	0	-175.34	-51.38	3,083
52	17.5	31	-245.3	0.0	1.000	0.0	0.00	-23,342.85	-7.61	0	-245.34	-71.89	2,228
47	22.5	10	-315.3	0.0	1.000	0.0	0.00	-31,851.85	-3.15	0	-315.34	-92.40	924
42	27.5	3	-385.3	0.0	1.000	0.0	0.00	-41,478.29	-1.16	0	-385.34	-112.91	339
37	32.5	1	-455.3	0.0	1.000	0.0	0.00	-52,457.76	-0.46	0	-455.34	-133.42	133
32	37.5	0	-525.3	0.0	1.000	0.0	0.00	-65,097.07	0.00	0	-525.34	-153.93	0
27	42.5	0	-595.3	0.0	1.000	0.0	0.00	-79,803.40	0.00	0	-595.34	-174.43	0
22	47.5	0	-665.3	0.0	1.000	0.0	0.00	-97,128.95	0.00	0	-665.34	-194.94	0
17	52.5	0	-735.3	0.0	1.000	0.0	0.00	-117,841.88	0.00	0	-735.34	-215.45	0
12	57.5	0	-805.3	0.0	1.000	0.0	0.00	-143,043.22	0.00	0	-805.34	-235.96	0
		211								0			9,979

Total Cooling kW Demand	42.0	kW
Total Cooling kWh Consumption	22,258	kWh
Total Heating kWh Consumption	9,979	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility	Carver Ranches Library
Unit Location	AHU-1
Mfg	
Model #	

**RED TEXT IS INPUT

Estimated SF Served by Unit	10500	SF	
Max Cooling Load	315.0	kbtu/hr	400SF/Ton
Max Heating Load	131.3	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	95	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	5.7	kbtu/hr	
Inside Cooling Design Temp	79	deg F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	15,000.0	btu/h.degF	
Tbal - Cooling	73.6	deg-F	
Ktot - Heating	-4375.0	btu/h.degF	
Tbal - Heating	68.5	deg-F	
DX Cooling System	35	tons	
	420	kbtu/hr	
	10.8	New EER/SEER/IPLV	
	1.111	kW/Ton	
	0	Age of Unit (yrs)	
	38.89	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	133.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	10.8	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.4	0	426.7	393.8	1.000	393.8	38.89	1.00	0.00	0
97	23.4	0	351.7	410.1	1.000	410.1	38.89	0.86	0.00	0
92	18.4	0	276.7	426.5	1.000	426.5	38.89	0.65	0.00	0
87	13.4	54	201.7	442.9	1.000	442.9	38.89	0.46	10.89	956
82	8.4	643	126.7	459.3	1.000	459.3	38.89	0.28	81.45	6,897
77	3.4	869	51.7	475.7	1.000	475.7	38.89	0.11	44.90	3,871
72	-1.6	624	-23.3	492.0	1.000	492.0	38.89	-0.05	-14.56	-1,151
		2,190							122.68	10,373

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.5	165	-28.3	0.0	1.000	0.0	0.00	-2,415.46	-4.68	0	-28.35	-8.31	1,370
57	11.5	123	-50.2	0.0	1.000	0.0	0.00	-4,515.14	-6.18	0	-50.22	-14.71	1,810
52	16.5	80	-72.1	0.0	1.000	0.0	0.00	-6,858.55	-5.77	0	-72.09	-21.12	1,690
47	21.5	43	-94.0	0.0	1.000	0.0	0.00	-9,490.74	-4.04	0	-93.97	-27.53	1,184
42	26.5	15	-115.8	0.0	1.000	0.0	0.00	-12,468.60	-1.74	0	-115.84	-33.94	509
37	31.5	5	-137.7	0.0	1.000	0.0	0.00	-15,865.02	-0.69	0	-137.72	-40.35	202
32	36.5	2	-159.6	0.0	1.000	0.0	0.00	-19,774.89	-0.32	0	-159.59	-46.76	94
27	41.5	0	-181.5	0.0	1.000	0.0	0.00	-24,324.17	0.00	0	-181.47	-53.17	0
22	46.5	0	-203.3	0.0	1.000	0.0	0.00	-29,683.70	0.00	0	-203.34	-59.58	0
17	51.5	0	-225.2	0.0	1.000	0.0	0.00	-36,091.08	0.00	0	-225.21	-65.99	0
12	56.5	0	-247.1	0.0	1.000	0.0	0.00	-43,886.92	0.00	0	-247.09	-72.40	0
		433								0			6,858

Total Cooling kW Demand	38.9	kW
Total Cooling kWh Consumption	10,373	kWh
Total Heating kWh Consumption	6,858	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	Carver Ranches Library
Unit Location	AHU-1
Mfg	
Model #	

**RED TEXT IS INPUT

Estimated SF Served by Unit	10500	SF	
Max Cooling Load	315.0	kbtu/hr	400SF/Ton
Max Heating Load	420.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	85	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	15,000.0	btu/h-degF	
Tbal - Cooling	73.6	deg-F	
Ktot - Heating	-14000.0	btu/h-degF	
Tbal - Heating	69.5	deg-F	
DX Cooling System	35	tons	
	420	kbtu/hr	
	10.8	New EER/SEER/IPLV	
	1.111	kW/Ton	
	0	Age of Unit (yrs)	
	38.89	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	133	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.4	0	426.7	393.8	1.000	393.8	38.89	1.00	0.00	0
97	23.4	5	351.7	410.1	1.000	410.1	38.89	0.86	1.76	167
92	18.4	174	276.7	426.5	1.000	426.5	38.89	0.65	48.14	4,389
87	13.4	787	201.7	442.9	1.000	442.9	38.89	0.46	158.71	13,936
82	8.4	816	126.7	459.3	1.000	459.3	38.89	0.28	103.36	8,752
77	3.4	609	51.7	475.7	1.000	475.7	38.89	0.11	31.47	2,573
72	-1.6	278	-23.3	492.0	1.000	492.0	38.89	-0.05	-8.49	-513
		2,669							336.95	29,304

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.5	70	-105.3	0.0	1.000	0.0	0.00	-8,979.82	-7.37	0	-105.35	-30.87	2,161
57	12.5	34	-175.3	0.0	1.000	0.0	0.00	-15,767.39	-5.96	0	-175.34	-51.38	1,747
52	17.5	17	-245.3	0.0	1.000	0.0	0.00	-23,342.85	-4.17	0	-245.34	-71.89	1,222
47	22.5	5	-315.3	0.0	1.000	0.0	0.00	-31,851.95	-1.58	0	-315.34	-92.40	462
42	27.5	2	-385.3	0.0	1.000	0.0	0.00	-41,478.29	-0.77	0	-385.34	-112.91	226
37	32.5	1	-455.3	0.0	1.000	0.0	0.00	-52,457.76	-0.46	0	-455.34	-133.42	133
32	37.5	0	-525.3	0.0	1.000	0.0	0.00	-65,097.07	0.00	0	-525.34	-153.93	0
27	42.5	0	-595.3	0.0	1.000	0.0	0.00	-79,803.40	0.00	0	-595.34	-174.43	0
22	47.5	0	-665.3	0.0	1.000	0.0	0.00	-97,128.95	0.00	0	-665.34	-194.94	0
17	52.5	0	-735.3	0.0	1.000	0.0	0.00	-117,841.88	0.00	0	-735.34	-215.45	0
12	57.5	0	-805.3	0.0	1.000	0.0	0.00	-143,043.22	0.00	0	-805.34	-235.96	0
		129								0			5,951

Total Cooling kW Demand	38.9	kW
Total Cooling kWh Consumption	29,304	kWh
Total Heating kWh Consumption	5,951	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	Carver Ranches Library
Unit Location	AHU-1
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	10500	SF	
Max Cooling Load	315.0	kbtu/hr	400SF/Ton
Max Heating Load	420.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	85	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	15,000.0	btu/h-degF	
Tbal - Cooling	73.6	deg-F	
Ktot - Heating	-14000.0	btu/h-degF	
Tbal - Heating	69.5	deg-F	
DX Cooling System	35	tons	
	420	kbtu/hr	
	10.8	New EER/SEER/IPLV	
	1.111	kW/Ton	
	0	Age of Unit (yrs)	
	38.89	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	133	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.4	0	426.7	393.8	1.000	393.8	38.89	1.00	0.00	0
97	23.4	1	351.7	410.1	1.000	410.1	38.89	0.86	0.35	33
92	18.4	11	276.7	426.5	1.000	426.5	38.89	0.65	3.04	277
87	13.4	275	201.7	442.9	1.000	442.9	38.89	0.46	55.46	4,870
82	8.4	821	126.7	459.3	1.000	459.3	38.89	0.28	103.99	8,806
77	3.4	862	51.7	475.7	1.000	475.7	38.89	0.11	44.54	3,641
72	-1.6	539	-23.3	492.0	1.000	492.0	38.89	-0.05	-12.58	-994
		2,509							194.81	16,633

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.5	106	-105.3	0.0	1.000	0.0	0.00	-8,979.82	-11.17	0	-105.35	-30.87	3,272
57	12.5	60	-175.3	0.0	1.000	0.0	0.00	-15,767.39	-10.52	0	-175.34	-51.38	3,083
52	17.5	31	-245.3	0.0	1.000	0.0	0.00	-23,342.85	-7.61	0	-245.34	-71.89	2,228
47	22.5	10	-315.3	0.0	1.000	0.0	0.00	-31,851.85	-3.15	0	-315.34	-92.40	924
42	27.5	3	-385.3	0.0	1.000	0.0	0.00	-41,478.29	-1.16	0	-385.34	-112.91	339
37	32.5	1	-455.3	0.0	1.000	0.0	0.00	-52,457.76	-0.46	0	-455.34	-133.42	133
32	37.5	0	-525.3	0.0	1.000	0.0	0.00	-65,097.07	0.00	0	-525.34	-153.93	0
27	42.5	0	-595.3	0.0	1.000	0.0	0.00	-79,803.40	0.00	0	-595.34	-174.43	0
22	47.5	0	-665.3	0.0	1.000	0.0	0.00	-97,128.95	0.00	0	-665.34	-194.94	0
17	52.5	0	-735.3	0.0	1.000	0.0	0.00	-117,841.88	0.00	0	-735.34	-215.45	0
12	57.5	0	-805.3	0.0	1.000	0.0	0.00	-143,043.22	0.00	0	-805.34	-235.96	0
		211								0			9,979

Total Cooling kW Demand	38.9	kW
Total Cooling kWh Consumption	16,633	kWh
Total Heating kWh Consumption	9,979	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Carver Ranches Library
Optimize HVAC Schedules & Set Points - 1st Floor - AHU-1

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: vfd — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 15.0 hp
Motor load factor: 75%
Existing average motor eff: 88.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	133 MBtu/hr	Full load cooling:	36.3 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 14,572 kWh
Annual Heating Savings: 1,025 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

	Wtd 0.976 kW/ton	
Baseline (	96,759	kWh
Baseline I	19,600	kWh

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 83,732 kWh
Baseline Heating Energy: 3,512 kWh (Electric Conversion)

Existing		*Proposed*	
Unoccupied setback ends:	8.5 Setup and time must be adjusted together	Unoccupied setback ends:	8.5 Setup and time mus Setup and time mu
Unoccupied setback begins:	18.5	Unoccupied setback begins:	18.5
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	74°
Cooling setup temperature:	78°	Cooling setup temperature:	80°
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off **On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	65°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off **On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

EFLHs 2101.054 Hours

Utility Baseline 436,740 kWh
AC Usage 20% of Baseline

Occupied Cooling

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
97.5°	4.0	4.0	100%	96%	100%	96%	9.0	8.7	41.6	39.0
92.5°	175.1	175.1	83%	77%	83%	77%	5.8	4.7	34.6	32.1
87.5°	857.8	857.8	65%	59%	65%	59%	2.8	2.2	26.9	24.5
82.5°	957.7	957.7	46%	40%	46%	40%	1.1	0.8	19.2	16.8
77.5°	622.0	622.0	28%	22%	30%	30%	0.4	0.4	11.5	9.1
72.5°	257.2	257.2	9%	3%	30%	30%	0.4	0.4	3.8	1.4
67.5°	90.6	90.6	0%	0%	30%	30%	0.4	0.4	0.0	0.0
62.5°	44.6	44.6	0%	0%	30%	30%	0.4	0.4	0.0	0.0
57.5°	17.3	17.3	0%	0%	30%	30%	0.4	0.4	0.0	0.0
52.5°	5.8	5.8	0%	0%	30%	30%	0.4	0.4	0.0	0.0
47.5°	0.9	0.9	0%	0%	30%	30%	0.4	0.4	0.0	0.0
42.5°	-0.1	-0.1	0%	0%	30%	30%	0.4	0.4	0.0	0.0
37.5°	-0.1	-0.1	0%	0%	30%	30%	0.4	0.4	0.0	0.0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
	3,033	3,033								

Unoccupied Cooling / Savings

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (off)	vfd Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings Fan (kWh)	Savings Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	93%	88%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	76%	71%			0.0	0.0	0.0	0.0	4	7
92.5°	6.9	6.9	60%	54%	60%	54%	0.0	0.0	24.7	22.5	194	48
87.5°	241.2	241.2	43%	37%	43%	37%	0.0	0.0	17.8	15.5	571	2,650
82.5°	1227.3	1227.3	26%	21%	30%	30%	0.0	0.0	10.8	8.5	324	5,102
77.5°	1390.0	1390.0	9%	4%	30%	30%	0.0	0.0	3.8	1.5	0	4,640
72.5°	752.8	752.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	633
67.5°	299.4	299.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	155.4	155.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	92.7	92.7	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	46.2	46.2	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
47.5°	19.1	19.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
42.5°	7.1	7.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	1.1	1.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	4,239	4,239									1,094	13,478

Occupied Heating

Bin Average (°F)	Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
87.5°	4.0	4.0	0%	0%	30%	30%	0.4	0.4	0.0	0.0
82.5°	72.1	72.1	0%	0%	30%	30%	0.4	0.4	0.0	0.0
77.5°	213.8	213.8	0%	0%	30%	30%	0.4	0.4	0.0	0.0
72.5°	154.6	154.6	0%	0%	30%	30%	0.4	0.4	0.0	0.0
67.5°	76.5	76.5	0%	0%	30%	30%	0.4	0.4	0.0	0.0
62.5°	51.4	51.4	10%	10%	30%	30%	0.4	0.4	0.1	0.1
57.5°	27.9	27.9	30%	30%	30%	30%	0.4	0.4	0.4	0.4
52.5°	14.7	14.7	60%	60%	60%	60%	1.4	1.4	0.7	0.7
47.5°	4.4	4.4	70%	70%	70%	70%	3.5	3.5	0.9	0.9
42.5°	1.0	1.0	90%	90%	90%	90%	7.2	7.2	1.2	1.2
37.5°	-0.3	-0.3	100%	100%	100%	100%	9.8	9.8	1.3	1.3
32.5°	-0.1	-0.1	100%	100%	100%	100%	9.8	9.8	1.3	1.3
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3
	620	620								

Unoccupied Heating / Savings

Bin Average (°F)	Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	vfd cfm Existing	vfd cfm Retrofit	vfd Fan Existing (off)	vfd Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings Fan (kWh)	Savings Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	6.9	6.9	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	127.3	127.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
72.5°	287.4	287.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
67.5°	158.5	158.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	94.6	94.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	81.1	81.1	13%	0%	30%	30%	0.0	0.0	0.2	0.0	0	14
52.5°	67.3	67.3	31%	16%	31%	30%	0.0	0.0	0.4	0.2	0	11
47.5°	34.6	34.6	49%	35%	49%	35%	0.0	0.0	0.7	0.5	0	7
42.5°	12.0	12.0	67%	53%	67%	53%	0.0	0.0	0.9	0.7	0	2
37.5°	4.3	4.3	85%	71%	85%	71%	0.0	0.0	1.1	0.9	0	1
32.5°	2.1	2.1	100%	89%	100%	89%	0.0	0.0	1.3	1.2	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.3	1.3	0	0
	866	866									0	35

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Energy Savings Performance Contract
Whole Building Energy Model

Dan Pearl Library

MODEL CALIBRATION	Electric kWh	Nat. Gas Therms
Baseline	429,270	0
eQUEST Model	431,372	0
Error	0.49%	#DIV/0!

BASELINE MODEL

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	31,660	29,571	34,660	34,816	35,601	38,855	40,640	41,936	39,461	37,386	33,777	33,008	431,372
MAX KW	95.2	97.5	93.4	103	100.8	105.2	108.7	107.5	107.8	106.3	98.4	96.1	108.7
DAY/HR	23/14	27/14	20/14	17/14	29/14	26/14	43022	28/14	43053	42780	23/18	25/14	42926
EM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0

ECM - Lighting Upgrade

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	17,787	16,770	19,638	20,276	21,812	24,366	26,039	26,522	24,702	22,758	19,854	18,682	259,206
MAX KW	48.3	50.4	46.9	55.3	53.3	57.6	61.1	59.9	60.7	58.8	49.7	49.7	61.1
DAY/HR	23/14	27/14	20/14	17/14	42961	26/14	43022	28/14	43053	42780	20/14	25/14	42926
EM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	13,873	12,801	15,022	14,540	13,789	14,489	14,601	15,414	14,759	14,628	13,923	14,326	172,166
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	46.90	47.10	46.50	47.70	47.50	47.60	47.60	47.60	47.10	47.50	48.70	46.40	47.60

Savings Percent of Baseline
40.1%
#DIV/0!
47.35 Avg Monthly kW Savings

ECM - Optimize HVAC Schedules & Set Points

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	11,861	10,871	13,354	13,765	14,348	16,657	17,772	17,947	16,443	15,057	13,243	12,347	173,665
MAX KW	48.7	52.2	48.2	58.6	56.4	61.7	64.8	64.4	65	63.2	52.2	51.2	65
DAY/HR	23/14	27/14	20/14	17/14	42961	26/14	43022	29/14	43053	42790	42900	25/14	42988
EM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	5,926	5,899	6,284	6,511	7,464	7,709	8,267	8,575	8,259	7,701	6,611	6,335	85,541
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	-0.40	-1.80	-1.30	-3.30	-3.10	-4.10	-3.70	-4.50	-4.20	-4.40	-2.50	-1.50	-3.90

Savings Percent of Baseline
19.9%
#DIV/0!
-2.91 Avg Monthly kW Savings

ECM - Energy Efficient Upgrades to BAS

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	11,448	10,522	12,869	13,208	13,785	15,809	16,851	17,051	15,635	14,393	12,751	11,951	166,252
MAX KW	46.8	50.1	46.4	55.7	53.8	58.4	60.9	61	61.4	59.9	50	49.1	61.4
DAY/HR	23/14	27/14	20/14	17/14	42961	26/14	43022	28/14	43053	42780	42900	25/14	42989
EM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	413	349	485	557	563	848	921	896	808	664	492	396	7,413
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	1.90	2.10	1.80	2.90	2.60	3.30	3.90	3.40	3.60	3.30	2.20	2.10	3.60

Savings Percent of Baseline
1.7%
#DIV/0!
2.76 Avg Monthly kW Savings

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Energy Savings Performance Contract
Whole Building Energy Model

Hallandale Library

MODEL CALIBRATION	Electric kWh	Nat. Gas Therms
Baseline	317,610	0
eQUEST Model	313,808	0
Error	-1.20%	#DIV/0!

BASELINE MODEL

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	22,753	21,372	23,852	24,486	26,209	29,179	31,040	31,441	28,379	27,080	21,008	23,179	313,808
MAX KW	57.2	58.3	59.5	63.3	63.5	68.1	69.3	69.5	70.5	66.7	62.4	61	70.5
DAY/HR	26/19	25/20	30/20	15/19	42984	28/17	43022	31/19	42935	42783	23/19	42997	42978

EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

ECM - Lighting Upgrade

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	18,888	17,647	19,318	20,092	21,845	24,657	26,448	26,804	24,963	22,682	19,842	19,091	262,197
MAX KW	52.7	54.6	47.1	50.9	51.1	55.9	57.5	58	58.8	54.7	49.9	48.5	58.8
DAY/HR	26/19	25/20	10/20	22/20	42963	28/17	43022	31/19	42935	42780	23/19	42997	42978

EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	3,865	3,625	4,535	4,394	4,364	4,522	4,592	4,837	4,416	4,398	4,166	4,087	51,601	16.2%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	4.50	3.70	12.40	12.40	12.40	12.20	11.70	11.50	11.70	12.00	12.50	12.50	11.70	10.79	Avg Monthly KW Savings

ECM - Network Tstats

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	10,919	10,354	12,765	13,003	13,547	16,251	18,363	19,119	16,726	14,372	12,176	11,508	169,103
MAX KW	48.9	47.6	48.4	53.5	53	59.1	59.2	59.4	60.5	56.9	51.9	49.6	60.5
DAY/HR	28/13	43059	42779	15/19	29/14	42869	43022	42874	42935	42874	23/19	23/20	42777

EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	7,969	7,293	8,553	7,098	8,290	8,406	8,065	7,605	8,237	8,230	7,966	7,503	93,094	29.3%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	3.80	7.00	-1.30	-2.00	-1.90	-2.20	-1.70	-1.40	-1.70	2.20	-2.00	-1.10	-1.70	-0.61	Avg Monthly KW Savings

ECM - DCV

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	11,202	10,508	12,911	13,086	13,288	15,271	16,603	17,053	15,528	13,798	12,269	11,692	163,229
MAX KW	47.5	49.4	49.5	54	53.5	57.7	58.9	58.9	60.1	57.1	52.3	50.8	60.1
DAY/HR													

EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	-283	-154	-146	-83	259	980	1,760	2,086	1,198	574	-113	-184	5,874	1.8%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	1.40	1.80	1.10	-0.50	0.50	0.40	0.30	0.50	0.40	0.20	-0.40	-1.20	0.40	-0.23	Avg Monthly KW Savings

ECM - Exh Fan Control

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	11,079	10,395	12,773	12,946	13,148	15,072	16,266	16,682	15,240	13,633	12,173	11,569	160,984
MAX KW	46.8	48.5	48.9	53	52.8	56.8	57.6	58.4	59.8	55.4	51.6	50.2	59.8
DAY/HR													

EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	123	113	138	140	140	199	337	371	280	165	116	123	2,245	0.7%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	0.70	0.90	0.60	1.60	0.70	0.90	1.30	0.50	0.30	1.70	0.70	0.60	0.30	0.83	Avg Monthly KW Savings

ECM - New HVAC

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	10,669	10,000	12,213	12,324	12,454	14,116	15,163	15,554	14,278	12,898	11,588	11,111	152,376
MAX KW	44.3	45.7	46.1	49.7	49.4	52.9	53.4	54.3	55.5	51.6	48.3	47.1	55.5
DAY/HR													

EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	410	395	560	622	694	956	1,103	1,128	870	737	575	458	8,608	2.7%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	2.50	2.80	2.80	3.30	3.40	3.90	4.20	4.10	4.30	3.80	3.30	3.10	4.30	3.46	Avg Monthly KW Savings

ECM - VAV Control of SZ Units

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	11,309	10,597	13,024	13,210	13,429	15,513	16,802	17,476	15,818	13,905	12,404	11,779	165,534
MAX KW	47.0	49.5	49.9	54.2	54	58.4	59.2	59.3	60.5	57.1	52.0	51.3	60.5
DAY/HR													

EM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	-390	-243	-259	-215	110	739	1,391	1,843	908	387	-228	-271	3,569	1.1%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	1.10	-1.90	-1.50	-0.70	-1.00	-0.30	0.00	0.10	0.00	0.20	-0.90	-1.70	0.00	-0.58	Avg Monthly KW Savings

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Lauderdale Lakes Library
Optimize HVAC Schedules and Set Points - 2nd Floor - AHU-2

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN(Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: vfd — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 20.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	455 MBtu/hr	Full load cooling:	41.7 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	0.99 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 9,732 kWh
Annual Heating Savings: 3,100 kWh
(No Electric Demand Savings Claimed)

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 97,459 kWh
Baseline Heating Energy: 12,081 kWh (Electric Conversion)
EFLHs: 2665.513 Hours
Utility Baseline: 312,720 kWh
AC Usage: 25% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	6.5	Unoccupied setback ends:	8	
Unoccupied setback begins:	23	Unoccupied setback begins:	22	
Weekends unoccupied?	No (Yes / No)	Weekends unoccupied?	No (Yes / No)	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	73°	
Cooling setup temperature:	82°	Cooling setup temperature:	82°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	73°	Occupied heating space temperature:	73°	
Heating setback temperature:	60°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (off)	vfd Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	85%	85%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	13.0	13.0	41.3	41.3	0.0	0.0	68%	68%			0.0	0.0	0.0	0.0	0	0
92.5°	180.8	179.5	83%	83%	83%	83%	7.6	7.6	34.4	34.4	1.3	2.5	52%	52%	52%	52%	0.0	0.0	21.3	21.3	10	16
87.5°	1028.8	978.8	65%	65%	65%	65%	3.7	3.7	26.7	26.7	70.4	120.3	35%	35%	35%	35%	0.0	0.0	14.3	14.3	186	620
82.5°	1648.6	1350.3	46%	46%	46%	46%	1.5	1.5	19.1	19.1	536.4	834.8	18%	18%	30%	30%	0.0	0.0	7.4	7.4	440	3,502
77.5°	1363.4	1002.8	28%	28%	30%	30%	0.5	0.5	11.5	11.5	659.6	1009.3	1%	1%	30%	30%	0.0	0.0	0.4	0.4	172	3,872
72.5°	638.1	446.0	9%	9%	30%	30%	0.5	0.5	3.8	3.0	370.7	564.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	96	730
67.5°	[illegible]	[illegible]	0%	0%	30%	30%	0.5	0.5	0.0	0.0	[illegible]	[illegible]	0%	0%	30%	30%	0.0	0.0	0.0	0.0	[illegible]	0
62.5°	117.4	76.0	0%	0%	30%	30%	0.5	0.5	0.0	0.0	82.6	124.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	20	0
57.5°	58.4	32.8	0%	0%	30%	30%	0.5	0.5	0.0	0.0	51.6	77.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	13	0
52.5°	25.3	12.5	0%	0%	30%	30%	0.5	0.5	0.0	0.0	26.7	39.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	6	0
47.5°	8.6	3.3	0%	0%	30%	30%	0.5	0.5	0.0	0.0	11.4	16.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	3	0
42.5°	2.8	0.8	0%	0%	30%	30%	0.5	0.5	0.0	0.0	4.3	6.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	1	0
37.5°	0.3	0.0	0%	0%	30%		0.5	0.0	0.0	0.0	0.7	1.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	5,302	4,243									1,970	3,029									984	8,749

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	vfd cfm Existing	vfd cfm Retrofit	vfd Fan Existing (off)	vfd Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.5	0.5	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	76.4	75.3	0%	0%	30%	30%	0.5	0.5	0.0	0.0	2.6	3.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	1	0
77.5°	295.1	266.5	0%	0%	30%	30%	0.5	0.5	0.0	0.0	45.9	74.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	14	0
72.5°	313.6	243.0	0%	0%	30%	30%	0.5	0.5	0.0	0.0	128.4	199.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	35	0
67.5°	158.1	117.3	0%	0%	30%	30%	0.5	0.5	0.0	0.0	76.9	117.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	20	0
62.5°	101.1	77.3	10%	10%	30%	30%	0.5	0.5	0.5	0.5	44.9	68.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	12	11
57.5°	68.1	47.0	30%	30%	30%	30%	0.5	0.5	1.4	1.4	40.9	62.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	10	29
52.5°	41.3	26.0	50%	50%	50%	50%	1.8	1.8	2.3	2.3	30.7	46.0	8%	8%	30%	30%	0.0	0.0	0.3	0.3	28	30
47.5°	18.9	9.3	70%	70%	70%	70%	4.6	4.6	3.2	3.2	20.1	29.8	26%	26%	30%	30%	0.0	0.0	1.2	1.2	45	19
42.5°	5.9	2.5	90%	90%	90%	90%	9.5	9.5	4.1	4.1	7.1	10.5	44%	44%	44%	44%	0.0	0.0	2.0	2.0	32	7
37.5°	1.3	0.0	100%	100%	100%		13.0	0.0	4.6	4.6	2.8	4.0	62%	62%	62%	62%	0.0	0.0	2.8	2.8	16	2
32.5°	0.6	0.0	100%	100%	100%		13.0	0.0	4.6	4.6	1.4	2.0	80%	80%	80%	80%	0.0	0.0	3.7	3.7	8	1
27.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	99%	99%			0.0	0.0	4.5	4.5	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0.0	0.0	100%	100%			0.0	0.0	4.6	4.6	0	0
	1,084	868									402	618									220	98

OPTERRA
An ENGIE company

Broward County
Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Lauderdale Lakes Library
BAS System Checkout - 1st Floor - AHU-1

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type:	vfd	Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**	
VAV min cfm:	40%	Not applicable to "CV"	
Total fan motor hp:	10.0 hp		
Motor load factor:	75%		
Existing average motor eff:	89.0%		
Drive eff:	96%		
VFD eff:	97%		

Load profile characteristics (enter under Equip Summary page):

Full load heating:	147 MBtu/hr	Full load cooling:	35.3 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 7,579 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

	W/o 0.976 kW/ton	
Baseline (	96,759	kWh
Baseline I	19,500	kWh

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints (If <1, reduces load change.)

Baseline Cooling Energy: 73,740 kWh
Baseline Heating Energy: 2,780 kWh (Electric Conversion)
EFLHs: 1099.646 Hours
Utility Baseline: 436,740 kWh
AC Usage: 18% of Baseline

Existing			*Proposed*		
Unoccupied setback ends:	8.5	Setup and time must be equal to setback	Unoccupied setback ends:	8.5	Setup and time mus Setup and time mu
Unoccupied setback begins:	18.5		Unoccupied setback begins:	18.5	
Weekends unoccupied?:	No	Yes / No	Weekends unoccupied?:	No	Yes / No
Occupied cooling space temperature:	72°		Occupied cooling space temperature:	74°	
Cooling setup temperature:	80°		Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off		Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°		Occupied heating space temperature:	70°	
Heating setback temperature:	60°		Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off		Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%		Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%		Unoccupied Percent Outside Air:	0%	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (off)	vfd Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Savings: Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	88%	88%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	96%	100%	96%	6.5	5.7	40.3	38.6	0.0	0.0	71%	71%			0.0	0.0	0.0	0.0	3	7
92.5°	175.1	175.1	83%	77%	83%	77%	3.8	3.1	33.6	31.2	6.9	6.9	54%	54%	54%	54%	0.0	0.0	21.8	21.8	128	418
87.5°	857.8	857.8	65%	59%	65%	59%	1.9	1.4	26.1	23.7	241.2	241.2	37%	37%	40%	40%	0.0	0.0	15.1	15.1	376	2,049
82.5°	957.7	957.7	46%	40%	46%	40%	0.7	0.5	18.7	16.3	1227.3	1227.3	21%	21%	40%	40%	0.0	0.0	8.3	8.3	214	2,286
77.5°	622.0	622.0	28%	22%	40%	40%	0.5	0.5	11.2	8.8	1390.0	1390.0	4%	4%	40%	40%	0.0	0.0	1.5	1.5	0	1,405
72.5°	257.2	257.2	9%	3%	40%	40%	0.5	0.5	3.7	1.3	752.8	752.8	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	614
67.5°	90.6	90.6	0%	0%	40%	40%	0.5	0.5	0.0	0.0	299.4	299.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
62.5°	44.6	44.6	0%	0%	40%	40%	0.5	0.5	0.0	0.0	155.4	155.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
57.5°	17.3	17.3	0%	0%	40%	40%	0.5	0.5	0.0	0.0	92.7	92.7	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
52.5°	5.8	5.8	0%	0%	40%	40%	0.5	0.5	0.0	0.0	46.2	46.2	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
47.5°	0.9	0.9	0%	0%	40%	40%	0.5	0.5	0.0	0.0	19.1	19.1	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
42.5°	-0.1	-0.1	0%	0%	40%	40%	0.5	0.5	0.0	0.0	7.1	7.1	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
37.5°	-0.1	-0.1	0%	0%	40%	40%	0.5	0.5	0.0	0.0	1.1	1.1	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,033	3,033									4,239	4,239									721	6,858

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	vfd cfm Existing	vfd cfm Retrofit	vfd Fan Existing (off)	vfd Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Savings: Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	40%	40%	0.5	0.5	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	72.1	72.1	0%	0%	40%	40%	0.5	0.5	0.0	0.0	6.9	6.9	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
77.5°	213.8	213.8	0%	0%	40%	40%	0.5	0.5	0.0	0.0	127.3	127.3	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
72.5°	154.6	154.6	0%	0%	40%	40%	0.5	0.5	0.0	0.0	287.4	287.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
67.5°	76.5	76.5	0%	0%	40%	40%	0.5	0.5	0.0	0.0	158.5	158.5	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
62.5°	51.4	51.4	10%	10%	40%	40%	0.5	0.5	0.1	0.1	94.6	94.6	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
57.5°	27.9	27.9	30%	30%	40%	40%	0.5	0.5	0.4	0.4	81.1	81.1	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
52.5°	14.7	14.7	50%	50%	50%	50%	0.9	0.9	0.7	0.7	67.3	67.3	16%	16%	40%	40%	0.0	0.0	0.2	0.2	0	0
47.5°	4.4	4.4	70%	70%	70%	70%	2.3	2.3	1.0	1.0	34.6	34.6	35%	35%	40%	40%	0.0	0.0	0.5	0.5	0	0
42.5°	1.0	1.0	90%	90%	90%	90%	4.8	4.8	1.3	1.3	12.0	12.0	53%	53%	53%	53%	0.0	0.0	0.8	0.8	0	0
37.5°	-0.3	-0.3	100%	100%	100%	100%	6.5	6.5	1.5	1.5	4.3	4.3	71%	71%	71%	71%	0.0	0.0	1.0	1.0	0	0
32.5°	-0.1	-0.1	100%	100%	100%	100%	6.5	6.5	1.5	1.5	2.1	2.1	89%	89%	89%	89%	0.0	0.0	1.3	1.3	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
	620	620									866	866									0	0

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Margate Library
BAS System Check-Out - AHU-2

[illegible]

Assumptions
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T)/(Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T))/(Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Fans
Fan operation type: vfd — Constant Volume: CV, VFD: VFD, Inlet Vane: IV, Discharge Damper: DD
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 3.0 hp
Motor load factor: 75%
Existing average motor eff: 90.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page)
Full load heating: 34 MBtuh — Full load cooling: 10.6 tons
Heating efficiency: 100% — Avg. Cooling efficiency: 1.10 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at: 40° — Cooling full load at: 97°
Heating zero load at: 65° — Cooling zero load at: 70°
Delta: 25° — Delta: 27°

Schedule
First month of cooling season: 2 February
Last month of cooling season: 11 November — Weather data: Fort Lauderdale Temperature Bins

Annual Cooling Savings: 2,326 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

With 0.076 kWh/sf
Baseline [illegible] 96,750 kWh
Baseline 1 19,600 kWh

Load Adjustments
Setpoint adjustment moderator: 0.0 — Damper ΔT changes in setpoints. (If < 1, reduces load change.)
Existing — Proposed
Unoccupied setback ends: [illegible] — Unoccupied setback ends: [illegible]
Unoccupied setback begins: 18.5 — Unoccupied setback begins: 18.5
Weekends unoccupied?: No Yes / No — Weekends unoccupied?: No Yes / No

Baseline Cooling Energy: 22,659 kWh
Baseline Heating Energy: 633 kWh (Electric Conversion)
EFLHs: 1873.380 Hours

Utility Baseline: 428,740 kWh
AC Usage: [illegible] of Baseline

Occupied cooling space temperature: 72° — Occupied cooling space temperature: 74°
Cooling setup temperature: 80° — Cooling setup temperature: 80°
Fan mode during unoccupied cooling: Off — Fan mode during unoccupied cooling: Off — On, Off, Cycle

Occupied heating space temperature: 70° — Occupied heating space temperature: 70°
Heating setback temperature: 60° — Heating setback temperature: 60°
Fan mode during unoccupied heating: Off — Fan mode during unoccupied heating: Off — On, Off, Cycle

Occupied Percent Outside Air: 85% — Occupied Percent Outside Air: 10%
Unoccupied Percent Outside Air: 0% — Unoccupied Percent Outside Air: 0%

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (cfff)	vfd Fan Proposed (cfff)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.5	0.5	100%	100%			0.5	0.5	0.6	0.6	0.0	0.0	86%	86%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	96%	100%	96%	1.9	1.7	12.4	11.0	0.0	0.0	71%	71%			0.0	0.0	0.0	0.0	1	2
92.5°	175.1	175.1	83%	77%	83%	77%	1.1	0.9	10.3	9.6	5.9	5.9	54%	54%	54%	54%	0.0	0.0	8.7	8.7	38	120
87.5°	667.5	667.5	66%	59%	66%	59%	0.6	0.4	8.0	7.3	341.2	341.2	37%	37%	37%	37%	0.0	0.0	4.6	4.6	113	629
82.5°	987.7	987.7	46%	40%	46%	40%	0.2	0.2	5.7	5.0	1227.3	1227.3	21%	21%	30%	30%	0.0	0.0	2.5	2.5	94	703
77.5°	822.0	822.0	28%	22%	30%	30%	0.1	0.1	3.4	2.7	1880.0	1880.0	4%	4%	30%	30%	0.0	0.0	0.8	0.8	0	486
72.5°	287.2	287.2	0%	5%	30%	30%	0.1	0.1	1.1	0.4	753.8	753.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	858
67.5°	90.8	90.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	392.4	392.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	44.6	44.6	0%	0%	30%	30%	0.1	0.1	0.0	0.0	155.4	155.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	17.2	17.2	0%	0%	30%	30%	0.1	0.1	0.0	0.0	102.7	102.7	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	5.8	5.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	46.2	46.2	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
47.5°	0.8	0.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	19.1	19.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
42.5°	-0.1	-0.1	0%	3%	30%	30%	0.1	0.1	0.0	0.0	7.1	7.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	0.1	0.1	0%	0%	30%	30%	0.1	0.1	0.0	0.0	1.1	1.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,030	3,030									4,209	4,209									216	2,159

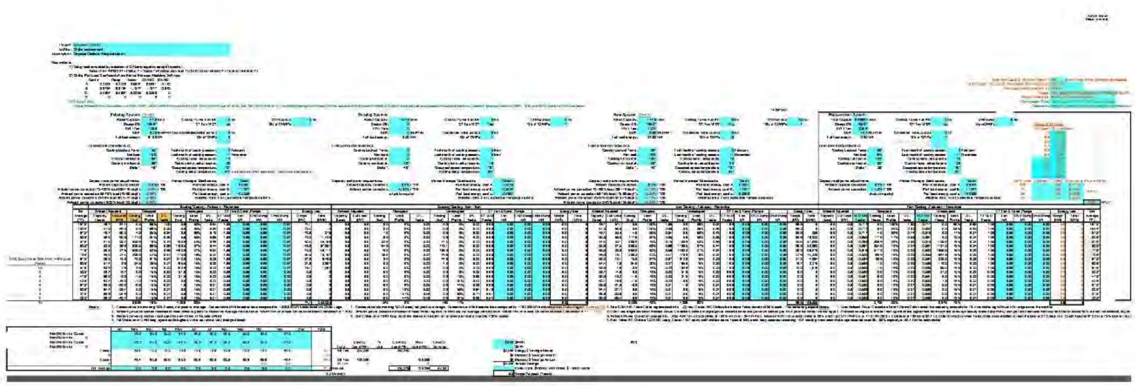
Existing Fan	Existing Cooling	Proposed Fan	Proposed Cooling	Savings Fan	Savings Cooling
0	0	0	0	0	0
0	0	0	0	0	0
7.77401	49.6239	6.88594	47.6082	0.888048	2.01799
200.600	1852.99	162.707	1724.5	38.3947	128.487
479.007	7999.71	366.121	7370.34	112.886	629.365
231.772	8610.21	140.276	7907.67	94.1526	702.642
46.8890	2776.54	46.8890	2290.16	0	486.383
18.9541	1945.05	18.9541	1086.14	0	858.606
6.47424	0	6.47424	0	0	0
3.28075	0	3.28075	0	0	0
1.27509	0	1.27509	0	0	0
0.42837	0	0.42837	0	0	0
0.08909	0	0.08909	0	0	0
-0.0046	0	-0.0046	0	0	0
0.0046	0	0.0046	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hr)	Heating Hours (hr)	Load Profile Existing	Load Profile Retrofit	vfd cfm Existing	vfd cfm Retrofit	vfd Fan Existing (cfff)	vfd Fan Retrofit (cfff)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.1	0.1	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	72.1	72.1	0%	0%	30%	30%	0.1	0.1	0.0	0.0	6.9	6.9	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	213.8	213.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	127.3	127.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
72.5°	164.8	164.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	287.4	287.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
67.5°	76.5	76.5	0%	0%	30%	30%	0.1	0.1	0.0	0.0	168.6	168.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	51.4	51.4	10%	10%	30%	30%	0.1	0.1	0.0	0.0	94.6	94.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	27.9	27.9	30%	30%	30%	30%	0.1	0.1	0.1	0.1	81.1	81.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	14.7	14.7	50%	50%	50%	50%	0.3	0.3	0.2	0.2	57.3	57.3	16%	16%	30%	30%	0.0	0.0	0.1	0.1	0	0
47.5°	4.4	4.4	70%	70%	70%	70%	0.7	0.7	0.2	0.2	34.6	34.6	35%	35%	35%	35%	0.0	0.0	0.1	0.1	0	0
42.5°	1.0	1.0	90%	90%	90%	90%	1.4	1.4	0.3	0.3	12.0	12.0	63%	63%	63%	63%	0.0	0.0	0.2	0.2	0	0
37.5°	-0.3	-0.3	100%	100%	100%	100%	1.9	1.9	0.3	0.3	4.3	4.3	71%	71%	71%	71%	0.0	0.0	0.2	0.2	0	0
32.5°	-0.1	-0.1	100%	100%	100%	100%	1.9	1.9	0.3	0.3	2.1	2.1	89%	89%	89%	89%	0.0	0.0	0.3	0.3	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
	630	630									988	988									0	0

Existing Fan	Existing Heating	Proposed Fan	Proposed Heating	Savings Fan	Savings Cooling
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0.29479	0	0.29479	0	0	0
5.31544	0	5.31544	0	0	0
15.7529	0	15.7529	0	0	0
11.3966	0	11.3966	0	0	0
5.63787	0	5.63787	0	0	0
3.79062	1.75656	3.79062	1.75656	0	0
2.06090	2.86052	2.06090	2.86052	0	0
3.99633	5.70727	3.99633	5.70727	0	0
3.08129	5.13521	3.08129	5.13521	0	0
1.49011	2.48667	1.49011	2.48667	0	0
-0.4869	0.94323	-0.4869	0.94323	0	0
-0.2429	0.60046	-0.2429	0.60046	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:



Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Broward County
Lauderdale Lakes Library
Optimize HVAC Schedules and Set Points - 1st Floor - AHU-1

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:
Fan operation type: vfd — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 40% — Not applicable to "CV"

Total fan motor hp: 50.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):
Full load heating: 147 MBtu/hr — Full load cooling: 36.3 tons
Heating efficiency: 100% — Avg. Cooling efficiency: 1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at: 40° — Cooling full load at: 97°
Heating zero load at: 65° — Cooling zero load at: 70°
Delta: 25° — Delta: 27°

Annual Cooling Savings: 4,112 kWh
Annual Heating Savings: 1,320 kWh
(No Electric Demand Savings Claimed)

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

With 0.976 kW/ton
Baseline (96,753 kWh
Baseline I 19,600 kWh

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 77,880 kWh
Baseline Heating Energy: 4,100 kWh (Electric Conversion)

Existing			Proposed		
Unoccupied setback ends:	8.5	Setup and time must be adjust for cooling	Unoccupied setback ends:	8.5	Setup and time mus Setup and time mu
Unoccupied setback begins:	20		Unoccupied setback begins:	18.5	
Weekends unoccupied?	No	Yes / No	Weekends unoccupied?	No	Yes / No
Occupied cooling space temperature:	72°		Occupied cooling space temperature:	72°	
Cooling setup temperature:	80°		Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off		Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°		Occupied heating space temperature:	70°	
Heating setback temperature:	65°		Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off		Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%		Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%		Unoccupied Percent Outside Air:	0%	

EFLHs: 2034.462 Hours
Utility Baseline: 436,740 kWh
AC Usage: 18% of Baseline

Occupied Cooling

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
97.5°	4.0	4.0	100%	100%	100%	100%	6.5	6.5	40.3	40.3
92.5°	177.0	175.1	83%	83%	83%	83%	3.8	3.8	33.6	33.6
87.5°	908.3	857.8	65%	65%	65%	65%	1.9	1.9	26.1	26.1
82.5°	1109.0	957.7	46%	46%	46%	46%	0.7	0.7	18.7	18.7
77.5°	763.2	622.0	20%	20%	40%	40%	0.6	0.5	11.2	11.2
72.5°	325.4	357.2	9%	9%	40%	40%	0.5	0.5	3.7	3.7
67.5°	113.4	90.6	0%	0%	40%	40%	0.5	0.5	0.0	0.0
62.5°	55.1	44.6	0%	0%	40%	40%	0.5	0.5	0.0	0.0
57.5°	22.0	17.3	0%	0%	40%	40%	0.5	0.5	0.0	0.0
52.5°	7.7	5.8	0%	0%	40%	40%	0.5	0.5	0.0	0.0
47.5°	1.5	0.9	0%	0%	40%	40%	0.5	0.5	0.0	0.0
42.5°	0.1	-0.1	0%	0%	40%	40%	0.5	0.5	0.0	0.0
37.5°	-0.1	-0.1	0%	0%	40%	40%	0.5	0.5	0.0	0.0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
	3,487	3,033								

Unoccupied Cooling / Savings

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (off)	vfd Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings Fan (kWh)	Savings Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	88%	88%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	71%	71%			0.0	0.0	0.0	0.0	0	0
92.5°	5.0	6.9	54%	54%	54%	54%	0.0	0.0	21.8	21.8	7	22
87.5°	190.8	241.2	37%	37%	40%	40%	0.0	0.0	15.1	15.1	94	558
82.5°	1076.0	1227.3	21%	21%	40%	40%	0.0	0.0	8.3	8.3	112	1,570
77.5°	1246.8	1390.0	4%	4%	40%	40%	0.0	0.0	1.5	1.5	71	1,369
72.5°	884.6	757.8	0%	0%	40%	40%	0.0	0.0	0.0	0.0	34	255
67.5°	276.6	289.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	11	0
62.5°	144.9	155.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	5	0
57.5°	88.0	92.7	0%	0%	40%	40%	0.0	0.0	0.0	0.0	2	0
52.5°	44.3	46.2	0%	0%	40%	40%	0.0	0.0	0.0	0.0	1	0
47.5°	18.5	19.1	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
42.5°	6.9	7.1	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
37.5°	1.1	1.1	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,785	4,239									338	3,774

Occupied Heating

Bin Average (°F)	Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
87.5°	4.0	4.0	0%	0%	40%	40%	0.5	0.5	0.0	0.0
82.5°	73.4	72.1	0%	0%	40%	40%	0.5	0.5	0.0	0.0
77.5°	236.1	213.8	0%	0%	40%	40%	0.5	0.5	0.0	0.0
72.5°	188.4	154.6	0%	0%	40%	40%	0.5	0.5	0.0	0.0
67.5°	91.3	76.5	0%	0%	40%	40%	0.5	0.5	0.0	0.0
62.5°	61.0	51.4	10%	10%	40%	40%	0.5	0.5	0.1	0.1
57.5°	34.7	27.9	30%	30%	40%	40%	0.5	0.5	0.4	0.4
52.5°	18.4	14.7	50%	50%	50%	50%	0.9	0.9	0.7	0.7
47.5°	5.8	4.4	70%	70%	70%	70%	2.3	2.3	1.0	1.0
42.5°	1.4	1.0	90%	90%	90%	90%	4.8	4.8	1.3	1.3
37.5°	-0.3	-0.3	100%	100%	100%	100%	6.5	6.5	1.5	1.5
32.5°	-0.1	-0.1	100%	100%	100%	100%	6.5	6.5	1.5	1.5
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5
	713	620								

Unoccupied Heating / Savings

Bin Average (°F)	Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	vfd cfm Existing	vfd cfm Retrofit	vfd Fan Existing (off)	vfd Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings Fan (kWh)	Savings Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	5.6	6.9	0%	0%	40%	40%	0.0	0.0	0.0	0.0	1	0
77.5°	105.9	127.3	0%	0%	40%	40%	0.0	0.0	0.0	0.0	11	0
72.5°	253.6	287.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	17	0
67.5°	143.7	158.5	0%	0%	40%	40%	0.0	0.0	0.0	0.0	7	0
62.5°	85.0	94.6	0%	0%	40%	40%	0.0	0.0	0.0	0.0	5	1
57.5°	74.3	81.1	13%	0%	40%	40%	0.0	0.0	0.2	0.0	3	17
52.5°	63.6	67.3	31%	16%	40%	40%	0.0	0.0	0.5	0.2	3	13
47.5°	33.3	34.6	49%	35%	49%	40%	0.0	0.0	0.7	0.5	3	8
42.5°	11.6	12.0	67%	53%	67%	53%	0.0	0.0	1.0	0.8	2	3
37.5°	4.3	4.3	85%	71%	85%	71%	0.0	0.0	1.3	1.0	0	1
32.5°	2.1	2.1	100%	89%	100%	89%	0.0	0.0	1.5	1.3	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.5	1.5	0	0
	773	866									52	43

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Margate Library
Optimize HVAC Schedules and Set Points - AHU-2

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN(Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:
Fan operation type: vfd — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 3.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	34 MBtu/hr	Full load cooling:	10.8 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 215 kWh
Annual Heating Savings: 229 kWh
(No Electric Demand Savings Claimed)

With 0.976 kW/ton
Baseline (96,758 kWh
Baseline (19,600 kWh

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampers ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 22,774 kWh
Baseline Heating Energy: 851 kWh (Electric Conversion)
EFLHs: 1908.21 Hours
Utility Baseline: 436,740 kWh
AC Usage: 5% of Baseline

Existing		Proposed	
Unoccupied setback ends:	10 Setup and time must be ~~different~~	Unoccupied setback ends:	8.5 Setup and time mus Setup and time mu
Unoccupied setback begins:	20	Unoccupied setback begins:	18.5
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No
Occupied cooling space temperature:	72°	Occupied cooling space temperature:	72°
Cooling setup temperature:	80°	Cooling setup temperature:	80°
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off **On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	65°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off **On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

Bin Average (°F)	Occupied Cooling – Cooling Hours Existing	Occupied Cooling – Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling – Cooling Hours Existing	Unoccupied Cooling – Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (off)	vfd Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings Fan (kWh)	Savings Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	88%	88%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	1.9	1.9	12.4	12.4	0.0	0.0	71%	71%			0.0	0.0	0.0	0.0	0	0
92.5°	177.0	175.1	83%	83%	83%	83%	1.1	1.1	10.3	10.3	5.0	8.9	54%	54%	54%	54%	0.0	0.0	6.7	6.7	2	7
87.5°	898.5	857.8	65%	65%	65%	65%	0.6	0.6	8.0	8.0	200.5	241.2	37%	37%	37%	37%	0.0	0.0	4.6	4.6	23	138
82.5°	990.5	957.7	46%	46%	46%	46%	0.2	0.2	5.7	5.7	1194.5	1227.3	21%	21%	30%	30%	0.0	0.0	2.5	2.5	7	105
77.5°	609.3	622.0	20%	20%	30%	30%	0.1	0.1	3.4	3.4	1402.6	1390.0	4%	4%	30%	30%	0.0	0.0	0.5	0.5	1	-38
72.5°	236.8	257.2	9%	9%	30%	30%	0.1	0.1	1.1	1.1	773.3	762.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	-2	-23
67.5°	76.8	90.6	0%	0%	30%	30%	0.1	0.1	0.0	0.0	314.3	299.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	-1	0
62.5°	34.5	44.6	0%	0%	30%	30%	0.1	0.1	0.0	0.0	165.5	155.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	-1	0
57.5°	8.5	17.3	0%	0%	30%	30%	0.1	0.1	0.0	0.0	101.5	92.7	0%	0%	30%	30%	0.0	0.0	0.0	0.0	-1	0
52.5°	0.8	5.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	51.3	46.2	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
47.5°	-1.5	0.9	0%	0%	30%	30%	0.1	0.1	0.0	0.0	21.5	19.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
42.5°	-1.0	-0.1	0%	0%	30%	30%	0.1	0.1	0.0	0.0	8.0	7.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	-0.3	-0.1	0%	0%	30%	30%	0.1	0.1	0.0	0.0	1.3	1.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,033	3,033									4,239	4,239									27	188

Bin Average (°F)	Occupied Heating – Heating Hours Existing	Occupied Heating – Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	vfd cfm Existing	vfd cfm Proposed	vfd Fan Existing (kW)	vfd Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating – Heating Hours (hrs)	Unoccupied Heating – Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	vfd cfm Existing	vfd cfm Retrofit	vfd Fan Existing (off)	vfd Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings Fan (kWh)	Savings Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.1	0.1	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	73.3	72.1	0%	0%	30%	30%	0.1	0.1	0.0	0.0	5.8	6.9	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	226.5	213.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	114.5	127.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	1	0
72.5°	159.5	154.6	0%	0%	30%	30%	0.1	0.1	0.0	0.0	282.5	287.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
67.5°	72.8	76.5	0%	0%	30%	30%	0.1	0.1	0.0	0.0	162.3	158.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	50.5	51.4	10%	10%	30%	30%	0.1	0.1	0.0	0.0	95.5	94.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	24.8	27.9	30%	30%	30%	30%	0.1	0.1	0.1	0.1	84.3	81.1	13%	0%	30%	30%	0.0	0.0	0.0	0.0	0	3
52.5°	10.8	14.7	60%	60%	60%	60%	0.3	0.3	0.2	0.2	61.3	57.3	31%	16%	31%	30%	0.0	0.0	0.1	0.1	-1	3
47.5°	0.5	4.4	70%	70%	70%	70%	0.7	0.7	0.2	0.2	38.5	34.6	49%	35%	49%	35%	0.0	0.0	0.2	0.1	-3	1
42.5°	-0.5	1.0	90%	90%	90%	90%	1.4	1.4	0.3	0.3	13.5	12.0	67%	53%	67%	53%	0.0	0.0	0.2	0.2	-2	0
37.5°	-1.0	-0.3	100%	100%	100%	100%	1.9	1.9	0.3	0.3	5.0	4.3	85%	71%	85%	71%	0.0	0.0	0.3	0.2	-1	0
32.5°	-0.5	-0.1	100%	100%	100%	100%	1.9	1.9	0.3	0.3	2.5	2.1	100%	89%	100%	89%	0.0	0.0	0.3	0.3	-1	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0.0	0.0	100%	100%			0.0	0.0	0.3	0.3	0	0
	621	620									866	866									-7	8

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Northwest Regional Library
AHU-1: Optimize HVAC Schedules and Set Points

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 25.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	184 MBtu/hr	Full load cooling:	63.3 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	92°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	22°

Annual Cooling Savings: 66,023 kWh
Annual Heating Savings: 4,562 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change)

Existing		Proposed	
Unoccupied setback ends:	0	Unoccupied setback ends:	8
Unoccupied setback begins:	24	Unoccupied setback begins:	19
Weekends unoccupied?	No (Yes / No)	Weekends unoccupied?	No (Yes / No)
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	73°
Cooling setup temperature:	78°	Cooling setup temperature:	80°
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off **On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	65°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off **On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

Baseline Cooling Energy: 246,505 kWh
Baseline Heating Energy: 8,402 kWh (Electric Conversion)
EFLHc: 3521.741 Hours
Utility Baseline: 1401120 kWh
AC Usage: 18% of Baseline

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (off)	VFD Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	16.2	16.2	72.4	72.4	0.0	0.0	97%	90%			0.0	0.0	0.0	0.0	0	0
92.5°	182.0	175.8	100%	100%	100%	100%	16.2	16.2	72.4	72.4	0.0	6.3	76%	70%		70%	0.0	0.0	0.0	50.5	101	136
87.5°	1088.0	877.5	80%	80%	80%	80%	8.3	8.3	57.6	57.6	1.0	221.1	56%	49%	56%	49%	0.0	0.0	40.4	35.6	1,836	4,844
82.5°	2184.0	1047.6	57%	57%	57%	57%	3.2	3.2	41.1	41.1	1.0	1137.4	35%	29%	35%	30%	0.0	0.0	25.4	20.6	3,659	23,287
77.5°	2012.0	720.4	34%	34%	34%	34%	0.8	0.8	24.7	24.7	0.0	1291.6	14%	8%		30%	0.0	0.0	9.0	5.7	1,081	24,531
72.5°	1010.0	309.6	11%	11%	30%	30%	0.6	0.6	6.2	6.2	0.0	700.5	0%	0%		30%	0.0	0.0	0.0	0.0	430	5,762
67.5°	[illegible]	110.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	2.0	779.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	170	0
62.5°	200.0	55.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	145.0	0%	0%		30%	0.0	0.0	0.0	0.0	89	0
57.5°	111.0	23.4	0%	0%	30%	30%	0.6	0.6	0.0	0.0	-1.0	86.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	54	0
52.5°	52.0	8.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	43.3	0%	0%		30%	0.0	0.0	0.0	0.0	27	0
47.5°	20.0	2.1	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	17.9	0%	0%		30%	0.0	0.0	0.0	0.0	11	0
42.5°	7.0	0.4	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	6.6	0%	0%		30%	0.0	0.0	0.0	0.0	4	0
37.5°	1.0	0.0	0%	0%	30%		0.6	0.0	0.0	0.0	0.0	1.0	0%	0%		30%	0.0	0.0	0.0	0.0	1	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	7,269	3,336									3	3,937									7,463	58,560

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (off)	VFD Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	78.0	72.6	0%	0%	30%	30%	0.6	0.6	0.0	0.0	1.0	6.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	3	0
77.5°	341.0	223.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	117.3	0%	0%		30%	0.0	0.0	0.0	0.0	72	0
72.5°	442.0	175.5	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	266.5	0%	0%		30%	0.0	0.0	0.0	0.0	164	0
67.5°	236.0	87.6	0%	0%	30%	30%	0.6	0.6	0.0	0.0	-1.0	147.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	91	0
62.5°	146.0	58.1	10%	10%	30%	30%	0.6	0.6	0.2	0.2	0.0	87.9	0%	0%		30%	0.0	0.0	0.0	0.0	54	16
57.5°	109.0	33.5	30%	30%	30%	30%	0.6	0.6	0.6	0.6	0.0	75.5	13%	0%		30%	0.0	0.0	0.2	0.0	46	42
52.5°	72.0	18.5	50%	50%	50%	50%	2.3	2.3	0.9	0.9	0.0	53.5	31%	16%		30%	0.0	0.0	0.6	0.3	121	33
47.5°	39.0	6.6	70%	70%	70%	70%	5.8	5.8	1.3	1.3	0.0	32.4	49%	35%		35%	0.0	0.0	0.9	0.6	187	21
42.5°	13.0	1.8	90%	90%	90%	90%	11.9	11.9	1.7	1.7	0.0	11.3	67%	53%		53%	0.0	0.0	1.2	1.0	134	8
37.5°	4.0	0.0	100%	100%	100%		16.2	0.0	1.8	1.8	0.0	4.0	85%	71%		71%	0.0	0.0	1.6	1.3	65	2
32.5°	2.0	0.0	100%	100%	100%		16.2	0.0	1.8	1.8	0.0	2.0	100%	89%		89%	0.0	0.0	1.8	1.6	32	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
	1,486	682									0	804									970	123

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Northwest Regional Library
AHU-2: Optimize HVAC Schedules and Set Points

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:
Fan operation type: CV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 100% — Not applicable to "CV"

Total fan motor hp: 2.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):
Full load heating: 44 MBtu/hr — Full load cooling: 8.1 tons
Heating efficiency: 100% — Avg. Cooling efficiency: 1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at: 40° — Cooling full load at: 97°
Heating zero load at: 65° — Cooling zero load at: 70°
Delta: 25° — Delta: 27°

Annual Cooling Savings: 1,800 kWh
Annual Heating Savings: 410 kWh
(No Electric Demand Savings Claimed)

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 23,368 kWh
Baseline Heating Energy: 2,070 kWh (Electric Conversion)
EFLHs: 2753.634 Hours
Utility Baseline: 1401120 kWh
AC Usage: 2% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	7.5	Unoccupied setback ends:	8	
Unoccupied setback begins:	19.25	Unoccupied setback begins:	19	
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	73°	
Cooling setup temperature:	78°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	65°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (off)	ConstVol Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	96%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	1.3	1.3	9.2	9.2	0.0	0.0	79%	74%			0.0	0.0	0.0	0.0	0	0
92.5°	176.1	175.8	83%	83%	100%	100%	1.3	1.3	7.7	7.7	5.9	6.3	62%	57%	100%	100%	0.0	0.0	5.8	5.3	0	4
87.5°	888.5	877.9	65%	65%	100%	100%	1.3	1.3	6.0	6.0	209.5	221.1	45%	40%	100%	100%	0.0	0.0	4.3	3.7	15	131
82.5°	1112.3	1047.6	46%	46%	100%	100%	1.3	1.3	4.3	4.3	1072.7	1137.4	29%	23%	100%	100%	0.0	0.0	2.6	2.1	81	672
77.5°	795.2	720.4	28%	28%	100%	100%	1.3	1.3	2.6	2.6	1216.8	1291.8	12%	6%	100%	100%	0.0	0.0	1.1	0.6	94	753
72.5°	350.4	309.5	9%	9%	100%	100%	1.3	1.3	0.9	0.9	869.6	700.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	51	76
67.5°	127.1	110.8	0%	0%	100%	100%	1.3	1.3	0.0	0.0	362.9	[illegible]	0%	0%	100%	100%	0.0	0.0	0.0	0.0	21	0
62.5°	63.6	55.0	0%	0%	100%	100%	1.3	1.3	0.0	0.0	136.4	145.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	11	0
57.5°	28.7	23.4	0%	0%	100%	100%	1.3	1.3	0.0	0.0	81.3	86.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	7	0
52.5°	11.4	8.8	0%	0%	100%	100%	1.3	1.3	0.0	0.0	40.6	43.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	3	0
47.5°	3.2	2.1	0%	0%	100%	100%	1.3	1.3	0.0	0.0	16.8	17.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	1	0
42.5°	0.8	0.4	0%	0%	100%	100%	1.3	1.3	0.0	0.0	6.2	6.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	1	0
37.5°	0.1	0.0	0%	0%	100%		1.3	0.0	0.0	0.0	0.9	1.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,562	3,336									3,710	3,937									285	1,595

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (off)	ConstVol Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	100%	100%	1.3	1.3	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	72.9	72.6	0%	0%	100%	100%	1.3	1.3	0.0	0.0	6.1	6.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
77.5°	230.2	223.8	0%	0%	100%	100%	1.3	1.3	0.0	0.0	110.8	117.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	8	0
72.5°	190.8	175.5	0%	0%	100%	100%	1.3	1.3	0.0	0.0	251.3	266.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	19	0
67.5°	96.3	87.6	0%	0%	100%	100%	1.3	1.3	0.0	0.0	138.7	147.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	11	0
62.5°	63.2	58.1	10%	10%	100%	100%	1.3	1.3	0.0	0.0	82.8	87.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	6	0
57.5°	37.9	33.5	30%	30%	100%	100%	1.3	1.3	0.1	0.1	71.1	75.5	13%	0%	100%	100%	0.0	0.0	0.1	0.0	6	5
52.5°	21.7	18.5	50%	50%	100%	100%	1.3	1.3	0.2	0.2	50.3	53.5	31%	16%	100%	100%	0.0	0.0	0.1	0.1	4	4
47.5°	8.6	6.6	70%	70%	100%	100%	1.3	1.3	0.3	0.3	30.4	32.4	49%	35%	100%	100%	0.0	0.0	0.2	0.2	2	2
42.5°	2.4	1.8	90%	90%	100%	100%	1.3	1.3	0.4	0.4	10.6	11.3	67%	53%	100%	100%	0.0	0.0	0.3	0.2	1	1
37.5°	0.3	0.0	100%	100%	100%		1.3	0.0	0.4	0.4	3.8	4.0	85%	71%	100%	100%	0.0	0.0	0.4	0.3	0	0
32.5°	0.1	0.0	100%	100%	100%		1.3	0.0	0.4	0.4	1.9	2.0	100%	89%	100%	100%	0.0	0.0	0.4	0.4	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
	728	682									758	804									58	12

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Northwest Regional Library
AHU-3: Optimize HVAC Schedules and Set Points

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN(Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type:	CV	Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm:	100%	Not applicable to "CV"
Total fan motor hp:	7.5 hp	
Motor load factor:	75%	
Existing average motor eff:	89.0%	
Drive eff:	96%	
VFD eff:	97%	

Load profile characteristics (enter under Equip Summary page):

Full load heating:	55 MBtu/hr	Full load cooling:	22.5 tons	
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton	(include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°	
Heating zero load at:	65°	Cooling zero load at:	70°	
Delta:	25°	Delta:	27°	

Annual Cooling Savings: 9,891 kWh
Annual Heating Savings: 1,236 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season:	2	February
Last month of cooling season:	11	November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Existing			*Proposed*		
Unoccupied setback ends:	7		Unoccupied setback ends:	8	
Unoccupied setback begins:	20.5		Unoccupied setback begins:	19	
Weekends unoccupied?	No	Yes / No	Weekends unoccupied?	No	Yes / No
Occupied cooling space temperature:	73°		Occupied cooling space temperature:	73°	
Cooling setup temperature:	78°		Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off		Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°		Occupied heating space temperature:	70°	
Heating setback temperature:	65°		Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off		Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%		Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%		Unoccupied Percent Outside Air:	0%	

Baseline Cooling Energy	73,755	kWh	
Baseline Heating Energy	5,439	kWh	(Electric Conversion)
EFLHc	3079.755	Hours	
Utility Baseline	1401120	kWh	
AC Usage	6%	of Baseline	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (off)	ConstVol Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	96%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	4.7	4.7	25.7	25.7	0.0	0.0	79%	74%			0.0	0.0	0.0	0.0	0	0
92.5°	177.6	175.8	83%	83%	100%	100%	4.7	4.7	21.4	21.4	4.4	6.3	62%	57%	100%	100%	0.0	0.0	16.0	14.6	9	19
87.5°	934.8	877.9	65%	65%	100%	100%	4.7	4.7	16.7	16.7	164.2	221.1	45%	40%	100%	100%	0.0	0.0	11.7	10.3	266	590
82.5°	1277.9	1047.6	46%	46%	100%	100%	4.7	4.7	11.9	11.9	907.1	1137.4	29%	23%	100%	100%	0.0	0.0	7.4	6.0	1,085	2,622
77.5°	964.2	720.4	28%	28%	100%	100%	4.7	4.7	7.1	7.1	1047.8	1291.6	12%	6%	100%	100%	0.0	0.0	3.0	1.6	1,149	2,792
72.5°	436.9	309.5	9%	9%	100%	100%	4.7	4.7	2.4	2.4	673.1	700.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	600	303
67.5°	158.8	110.8	0%	0%	100%	100%	4.7	4.7	0.0	0.0	231.3	279.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	226	0
62.5°	79.3	55.0	0%	0%	100%	100%	4.7	4.7	0.0	0.0	120.8	145.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	114	0
57.5°	37.1	23.4	0%	0%	100%	100%	4.7	4.7	0.0	0.0	72.9	86.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	65	0
52.5°	15.3	8.8	0%	0%	100%	100%	4.7	4.7	0.0	0.0	36.8	43.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	31	0
47.5°	4.7	2.1	0%	0%	100%	100%	4.7	4.7	0.0	0.0	15.3	17.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	12	0
42.5°	1.3	0.4	0%	0%	100%	100%	4.7	4.7	0.0	0.0	5.7	6.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	4	0
37.5°	0.1	0.0	0%	0%	100%		4.7	0.0	0.0	0.0	0.9	1.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	1	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	4,092	3,336									3,180	3,937									3,565	6,326

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (off)	ConstVol Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	100%	100%	4.7	4.7	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	74.1	72.6	0%	0%	100%	100%	4.7	4.7	0.0	0.0	4.9	6.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	7	0
77.5°	250.9	223.8	0%	0%	100%	100%	4.7	4.7	0.0	0.0	90.1	117.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	128	0
72.5°	228.5	175.5	0%	0%	100%	100%	4.7	4.7	0.0	0.0	213.5	266.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	250	0
67.5°	114.8	87.6	0%	0%	100%	100%	4.7	4.7	0.0	0.0	120.2	147.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	128	0
62.5°	74.7	58.1	10%	10%	100%	100%	4.7	4.7	0.1	0.1	71.3	87.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	78	1
57.5°	46.9	33.5	30%	30%	100%	100%	4.7	4.7	0.2	0.2	62.1	75.5	13%	0%	100%	100%	0.0	0.0	0.1	0.0	63	7
52.5°	27.4	18.5	50%	50%	100%	100%	4.7	4.7	0.3	0.3	44.6	53.5	31%	16%	100%	100%	0.0	0.0	0.2	0.1	42	5
47.5°	11.4	6.6	70%	70%	100%	100%	4.7	4.7	0.4	0.4	27.6	32.4	49%	35%	100%	100%	0.0	0.0	0.3	0.2	23	3
42.5°	3.4	1.8	90%	90%	100%	100%	4.7	4.7	0.5	0.5	9.6	11.3	67%	53%	100%	100%	0.0	0.0	0.4	0.3	8	1
37.5°	0.5	0.0	100%	100%	100%		4.7	0.0	0.5	0.5	3.5	4.0	85%	71%	100%	100%	0.0	0.0	0.5	0.4	2	0
32.5°	0.3	0.0	100%	100%	100%		4.7	0.0	0.5	0.5	1.8	2.0	100%	89%	100%	100%	0.0	0.0	0.5	0.5	1	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
	837	682									649	804									729	17

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Broward County
Northwest Regional Library
AHU-4: Optimize HVAC Schedules and Set Points

Assumptions:
1) 30% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN(Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:
Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 30.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):
Full load heating: 331 MBtu/hr — Full load cooling: 75.7 tons
Heating efficiency: 100% — Avg. Cooling efficiency: 1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at: 40° — Cooling full load at: 97°
Heating zero load at: 65° — Cooling zero load at: 70°
Delta: 25° — Delta: 27°

Annual Cooling Savings:	**62,726 kWh**
Annual Heating Savings:	**7,615 kWh**
(No Electric Demand Savings Claimed)	

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 234,845 kWh
Baseline Heating Energy: 14,214 kWh (Electric Conversion)
EFLHs: 2880 086 Hours
Utility Baseline: 1401120 kWh
AC Usage: 18% of Baseline

Existing
Unoccupied setback ends: 0
Unoccupied setback begins: 24
Weekends unoccupied?: No Yes / No

Proposed
Unoccupied setback ends: 8
Unoccupied setback begins: 19
Weekends unoccupied?: No Yes / No

Existing:
Occupied cooling space temperature: 73°
Cooling setup temperature: 78°
Fan mode during unoccupied cooling: Off

Proposed:
Occupied cooling space temperature: 73°
Cooling setup temperature: 80°
Fan mode during unoccupied cooling: Off — **On, Off, Cycle**

Existing:
Occupied heating space temperature: 70°
Heating setback temperature: 65°
Fan mode during unoccupied heating: Off

Proposed:
Occupied heating space temperature: 70°
Heating setback temperature: 60°
Fan mode during unoccupied heating: Off — **On, Off, Cycle**

Existing:
Occupied Percent Outside Air: 10%
Unoccupied Percent Outside Air: 0%

Proposed:
Occupied Percent Outside Air: 10%
Unoccupied Percent Outside Air: 0%

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (cfl)	VFD Fan Proposed (cfl)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	96%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	19.4	19.4	86.5	86.5	0.0	0.0	79%	74%			0.0	0.0	0.0	0.0	0	0
92.5°	182.0	175.8	83%	83%	83%	83%	11.4	11.4	72.1	72.1	0.0	6.3	62%	57%		57%	0.0	0.0	0.0	49.2	72	143
87.5°	1088.0	877.5	65%	65%	65%	65%	5.6	5.6	56.0	56.0	1.0	221.1	45%	40%	45%	40%	0.0	0.0	39.3	34.6	1,229	4,715
82.5°	2184.0	1047.6	46%	46%	46%	46%	2.2	2.2	40.0	40.0	1.0	1137.4	29%	23%	30%	30%	0.0	0.0	24.7	20.1	2,513	22,669
77.5°	2012.0	720.4	28%	28%	30%	30%	0.7	0.7	24.0	24.0	0.0	1291.6	12%	6%		30%	0.0	0.0	0.0	5.5	952	23,881
72.5°	1010.0	309.5	9%	9%	30%	30%	0.7	0.7	8.0	8.0	0.0	700.5	0%	0%		30%	0.0	0.0	0.0	0.0	616	6,609
67.5°	390.0	110.0	0%	0%	30%	30%	0.7	0.7	0.0	0.0	2.0	279.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	304	0
62.5°	200.0	55.0	0%	0%	30%	30%	0.7	0.7	0.0	0.0	0.0	145.0	0%	0%		30%	0.0	0.0	0.0	0.0	107	0
57.5°	111.0	23.4	0%	0%	30%	30%	0.7	0.7	0.0	0.0	-1.0	86.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	65	0
52.5°	52.0	8.8	0%	0%	30%	30%	0.7	0.7	0.0	0.0	0.0	43.3	0%	0%		30%	0.0	0.0	0.0	0.0	32	0
47.5°	20.0	2.1	0%	0%	30%	30%	0.7	0.7	0.0	0.0	0.0	17.9	0%	0%		30%	0.0	0.0	0.0	0.0	13	0
42.5°	7.0	0.4	0%	0%	30%	30%	0.7	0.7	0.0	0.0	0.0	6.6	0%	0%		30%	0.0	0.0	0.0	0.0	5	0
37.5°	1.0	0.0	0%	0%	30%		0.7	0.0	0.0	0.0	0.0	1.0	0%	0%		30%	0.0	0.0	0.0	0.0	1	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	7,269	3,336									3	3,937									5,708	57,018

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (cfl)	VFD Fan Retrofit (cfl)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.7	0.7	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	78.0	72.6	0%	0%	30%	30%	0.7	0.7	0.0	0.0	1.0	6.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	4	0
77.5°	341.0	223.8	0%	0%	30%	30%	0.7	0.7	0.0	0.0	0.0	117.3	0%	0%		30%	0.0	0.0	0.0	0.0	86	0
72.5°	442.0	175.5	0%	0%	30%	30%	0.7	0.7	0.0	0.0	0.0	266.5	0%	0%		30%	0.0	0.0	0.0	0.0	196	0
67.5°	236.0	87.6	0%	0%	30%	30%	0.7	0.7	0.0	0.0	-1.0	147.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	109	0
62.5°	146.0	58.1	10%	10%	30%	30%	0.7	0.7	0.3	0.3	0.0	87.9	0%	0%		30%	0.0	0.0	0.0	0.0	65	29
57.5°	109.0	33.5	30%	30%	30%	30%	0.7	0.7	1.0	1.0	0.0	75.5	13%	0%		30%	0.0	0.0	0.4	0.0	56	75
52.5°	72.0	18.5	50%	50%	50%	50%	2.7	2.7	1.7	1.7	0.0	53.5	31%	16%		30%	0.0	0.0	1.0	0.5	146	60
47.5°	39.0	6.6	70%	70%	70%	70%	6.9	6.9	2.3	2.3	0.0	32.4	49%	35%		35%	0.0	0.0	1.6	1.1	225	38
42.5°	13.0	1.8	90%	90%	90%	90%	14.3	14.3	3.0	3.0	0.0	11.3	67%	53%		53%	0.0	0.0	2.2	1.7	161	14
37.5°	4.0	0.0	100%	100%	100%		19.4	0.0	3.3	3.3	0.0	4.0	85%	71%		71%	0.0	0.0	2.8	2.3	78	4
32.5°	2.0	0.0	100%	100%	100%		19.4	0.0	3.3	3.3	0.0	2.0	100%	89%		89%	0.0	0.0	3.3	2.9	39	1
27.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
	1,486	682									0	804									1,164	220

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Northwest Regional Library
AHU-5: Optimize HVAC Schedules and Set Points

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN(Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: CV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 100% — Not applicable to "CV"

Total fan motor hp: 5.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating: 41 MBtu/hr
Heating efficiency: 100%
Heating full load at: 40°
Heating zero load at: 65°
Delta: 25°

Full load cooling: 13.8 tons
Avg. Cooling efficiency: 1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Cooling full load at: 97°
Cooling zero load at: 70°
Delta: 27°

Annual Cooling Savings: 2,262 kWh
Annual Heating Savings: 295 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampers ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 42,342 kWh
Baseline Heating Energy: 3,179 kWh (Electric Conversion)

EFLHs: 2879.335 Hours

Utility Baseline: 1401120 kWh
AC Usage: 3% of Baseline

Existing		*Proposed*	
Unoccupied setback ends:	8	Unoccupied setback ends:	8
Unoccupied setback begins:	19	Unoccupied setback begins:	19
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	73°
Cooling setup temperature:	78°	Cooling setup temperature:	80°
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off **On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	65°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off **On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

Occupied Cooling

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
97.5°	4.0	4.0	100%	100%	100%	100%	3.1	3.1	15.8	15.8
92.5°	175.8	175.8	83%	83%	100%	100%	3.1	3.1	13.2	13.2
87.5°	877.9	877.9	65%	65%	100%	100%	3.1	3.1	10.2	10.2
82.5°	1047.6	1047.6	46%	46%	100%	100%	3.1	3.1	7.3	7.3
77.5°	720.4	720.4	28%	28%	100%	100%	3.1	3.1	4.4	4.4
72.5°	308.5	308.5	9%	9%	100%	100%	3.1	3.1	1.5	1.5
67.5°	110.8	110.8	0%	0%	100%	100%	3.1	3.1	0.0	0.0
62.5°	55.0	55.0	0%	0%	100%	100%	3.1	3.1	0.0	0.0
57.5°	23.4	23.4	0%	0%	100%	100%	3.1	3.1	0.0	0.0
52.5°	8.8	8.8	0%	0%	100%	100%	3.1	3.1	0.0	0.0
47.5°	2.1	2.1	0%	0%	100%	100%	3.1	3.1	0.0	0.0
42.5°	0.4	0.4	0%	0%	100%	100%	3.1	3.1	0.0	0.0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
	3,336	3,336								

Unoccupied Cooling / Savings

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (off)	ConstVol Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings Fan (kWh)	Savings Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	96%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	79%	74%			0.0	0.0	0.0	0.0	0	0
92.5°	6.3	6.3	62%	57%	100%	100%	0.0	0.0	9.8	9.0	0	5
87.5°	221.1	221.1	45%	40%	100%	100%	0.0	0.0	7.2	6.3	0	188
82.5°	1137.4	1137.4	29%	23%	100%	100%	0.0	0.0	4.5	3.7	0	969
77.5°	1291.6	1291.6	12%	6%	100%	100%	0.0	0.0	1.9	1.0	0	1,100
72.5°	700.5	700.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
67.5°	279.3	279.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
62.5°	145.0	145.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
57.5°	86.6	86.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
52.5°	43.3	43.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
47.5°	17.9	17.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
42.5°	6.6	6.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
37.5°	1.0	1.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,937	3,937									0	2,262

Occupied Heating

Bin Average (°F)	Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
87.5°	4.0	4.0	0%	0%	100%	100%	3.1	3.1	0.0	0.0
82.5°	72.6	72.6	0%	0%	100%	100%	3.1	3.1	0.0	0.0
77.5°	223.8	223.8	0%	0%	100%	100%	3.1	3.1	0.0	0.0
72.5°	175.5	175.5	0%	0%	100%	100%	3.1	3.1	0.0	0.0
67.5°	87.6	87.6	0%	0%	100%	100%	3.1	3.1	0.0	0.0
62.5°	58.1	58.1	10%	10%	100%	100%	3.1	3.1	0.0	0.0
57.5°	33.5	33.5	30%	30%	100%	100%	3.1	3.1	0.1	0.1
52.5°	18.5	18.5	50%	50%	100%	100%	3.1	3.1	0.2	0.2
47.5°	6.6	6.6	70%	70%	100%	100%	3.1	3.1	0.3	0.3
42.5°	1.8	1.8	90%	90%	100%	100%	3.1	3.1	0.4	0.4
37.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
32.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
	682	682								

Unoccupied Heating / Savings

Bin Average (°F)	Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (off)	ConstVol Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings Fan (kWh)	Savings Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	6.4	6.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
77.5°	117.3	117.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
72.5°	266.5	266.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
67.5°	147.4	147.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
62.5°	87.9	87.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
57.5°	75.5	75.5	13%	0%	100%	100%	0.0	0.0	0.1	0.0	0	4
52.5°	53.5	53.5	31%	16%	100%	100%	0.0	0.0	0.1	0.1	0	3
47.5°	32.4	32.4	49%	35%	100%	100%	0.0	0.0	0.2	0.1	0	2
42.5°	11.3	11.3	67%	53%	100%	100%	0.0	0.0	0.3	0.2	0	1
37.5°	4.0	4.0	85%	71%	100%	100%	0.0	0.0	0.3	0.3	0	0
32.5°	2.0	2.0	100%	89%	100%	100%	0.0	0.0	0.4	0.4	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
	804	804									0	10

OPTERRA
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Broward County
Northwest Regional Library
AHU-1: BAS System Check-Out

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 25.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	184 MBtu/hr	Full load cooling:	63.3 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	92°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	22°

Annual Cooling Savings: 9,691 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bin

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Existing		*Proposed*	
Unoccupied setback ends:	8	Unoccupied setback ends:	8
Unoccupied setback begins:	19	Unoccupied setback begins:	19
Weekends unoccupied?:	No Yes / No	Weekends unoccupied?:	No Yes / No
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	74°
Cooling setup temperature:	80°	Cooling setup temperature:	80°
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off **On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	60°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off **On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

Baseline Cooling Energy: 180,482 kWh
Baseline Heating Energy: 3,841 kWh (Electric Conversion)

EFLHc: 2546.573 Hours

Utility Baseline: 1401120 kWh
AC Usage: 13% of Baseline

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (off)	VFD Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Savings: Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	16.2	16.2	72.4	72.4	0.0	0.0	90%	90%			0.0	0.0	0.0	0.0	0	0
92.5°	175.8	175.8	100%	99%	100%	99%	16.2	15.6	72.4	71.4	6.3	6.3	70%	70%	70%	70%	0.0	0.0	50.5	50.5	112	173
87.5°	877.9	877.9	80%	76%	80%	76%	8.9	7.3	57.6	54.9	221.1	221.1	49%	49%	49%	49%	0.0	0.0	35.6	35.6	920	2,311
82.5°	1047.6	1047.6	57%	53%	57%	53%	3.2	2.7	41.1	38.5	1137.4	1137.4	29%	29%	30%	30%	0.0	0.0	20.6	20.6	562	2,757
77.5°	720.4	720.4	34%	30%	34%	30%	0.8	0.6	24.7	22.0	1291.6	1291.6	8%	8%	30%	30%	0.0	0.0	5.7	5.7	144	1,896
72.5°	308.5	308.5	11%	0%	30%	30%	0.6	0.6	8.2	5.6	700.5	700.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	815
67.5°	110.0	110.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	279.3	279.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	55.0	55.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	145.0	145.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	23.4	23.4	0%	0%	30%	30%	0.6	0.6	0.0	0.0	86.6	86.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	8.8	8.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	43.3	43.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
47.5°	2.1	2.1	0%	0%	30%	30%	0.6	0.6	0.0	0.0	17.9	17.9	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
42.5°	0.4	0.4	0%	0%	30%	30%	0.6	0.6	0.0	0.0	6.6	6.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	1.0	1.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,336	3,336									3,937	3,937									1,739	7,952

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (off)	VFD Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Savings: Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	72.6	72.6	0%	0%	30%	30%	0.6	0.6	0.0	0.0	6.4	6.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	223.8	223.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	117.3	117.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
72.5°	175.5	175.5	0%	0%	30%	30%	0.6	0.6	0.0	0.0	266.5	266.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
67.5°	87.6	87.6	0%	0%	30%	30%	0.6	0.6	0.0	0.0	147.4	147.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	58.1	58.1	10%	10%	30%	30%	0.6	0.6	0.2	0.2	87.9	87.9	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	33.5	33.5	30%	30%	30%	30%	0.6	0.6	0.6	0.6	75.5	75.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	18.5	18.5	50%	50%	50%	50%	2.3	2.3	0.9	0.9	53.5	53.5	16%	16%	30%	30%	0.0	0.0	0.3	0.3	0	0
47.5°	6.6	6.6	70%	70%	70%	70%	5.8	5.8	1.3	1.3	32.4	32.4	35%	35%	35%	35%	0.0	0.0	0.6	0.6	0	0
42.5°	1.8	1.8	90%	90%	90%	90%	11.9	11.9	1.7	1.7	11.3	11.3	53%	53%	53%	53%	0.0	0.0	1.0	1.0	0	0
37.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	4.0	4.0	71%	71%	71%	71%	0.0	0.0	1.3	1.3	0	0
32.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	2.0	2.0	89%	89%	89%	89%	0.0	0.0	1.6	1.6	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0.0	0.0	100%	100%			0.0	0.0	1.8	1.8	0	0
	682	682									804	804									0	0

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Northwest Regional Library
AHU-2: BAS System Check-Out

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential: Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential: Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: CV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 100% — Not applicable to "CV"

Total fan motor hp: 2.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	44 MBtu/hr	Full load cooling:	8.1 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 857 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 21,488 kWh
Baseline Heating Energy: 1,561 kWh (Electric Conversion)

EFLHs: 2505.754 Hours

Utility Baseline: 1401120 kWh
AC Usage: 2% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	8	Unoccupied setback ends:	8	
Unoccupied setback begins:	19	Unoccupied setback begins:	19	
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	74°	
Cooling setup temperature:	80°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	60°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (off)	ConstVol Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Savings: Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	91%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	99%	100%	100%	1.3	1.3	9.2	9.1	0.0	0.0	74%	74%			0.0	0.0	0.0	0.0	0	0
92.5°	175.8	175.8	83%	80%	100%	100%	1.3	1.3	7.7	7.4	6.3	6.3	57%	57%	100%	100%	0.0	0.0	5.3	5.3	0	48
87.5°	877.9	877.9	65%	62%	100%	100%	1.3	1.3	6.0	5.7	221.1	221.1	40%	40%	100%	100%	0.0	0.0	3.7	3.7	0	240
82.5°	1047.6	1047.6	46%	43%	100%	100%	1.3	1.3	4.3	4.0	1137.4	1137.4	23%	23%	100%	100%	0.0	0.0	2.1	2.1	0	287
77.5°	720.4	720.4	28%	25%	100%	100%	1.3	1.3	2.6	2.3	1291.6	1291.6	6%	6%	100%	100%	0.0	0.0	0.6	0.6	0	197
72.5°	308.5	308.5	9%	6%	100%	100%	1.3	1.3	0.9	0.6	700.5	700.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	85
67.5°	110.0	110.0	0%	0%	100%	100%	1.3	1.3	0.0	0.0	279.3	279.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
62.5°	55.0	55.0	0%	0%	100%	100%	1.3	1.3	0.0	0.0	145.0	145.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
57.5°	23.4	23.4	0%	0%	100%	100%	1.3	1.3	0.0	0.0	86.6	86.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
52.5°	8.8	8.8	0%	0%	100%	100%	1.3	1.3	0.0	0.0	43.3	43.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
47.5°	2.1	2.1	0%	0%	100%	100%	1.3	1.3	0.0	0.0	17.9	17.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
42.5°	0.4	0.4	0%	0%	100%	100%	1.3	1.3	0.0	0.0	6.6	6.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	1.0	1.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,336	3,336									3,937	3,937									0	857

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (off)	ConstVol Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Savings: Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	100%	100%	1.3	1.3	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	72.6	72.6	0%	0%	100%	100%	1.3	1.3	0.0	0.0	6.4	6.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
77.5°	223.8	223.8	0%	0%	100%	100%	1.3	1.3	0.0	0.0	117.3	117.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
72.5°	175.5	175.5	0%	0%	100%	100%	1.3	1.3	0.0	0.0	266.5	266.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
67.5°	87.6	87.6	0%	0%	100%	100%	1.3	1.3	0.0	0.0	147.4	147.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
62.5°	58.1	58.1	10%	10%	100%	100%	1.3	1.3	0.0	0.0	87.9	87.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
57.5°	33.5	33.5	30%	30%	100%	100%	1.3	1.3	0.1	0.1	75.5	75.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
52.5°	18.5	18.5	50%	50%	100%	100%	1.3	1.3	0.2	0.2	53.5	53.5	16%	16%	100%	100%	0.0	0.0	0.1	0.1	0	0
47.5°	6.6	6.6	70%	70%	100%	100%	1.3	1.3	0.3	0.3	32.4	32.4	35%	35%	100%	100%	0.0	0.0	0.2	0.2	0	0
42.5°	1.8	1.8	90%	90%	100%	100%	1.3	1.3	0.4	0.4	11.3	11.3	53%	53%	100%	100%	0.0	0.0	0.2	0.2	0	0
37.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	4.0	4.0	71%	71%	100%	100%	0.0	0.0	0.3	0.3	0	0
32.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	2.0	2.0	89%	89%	100%	100%	0.0	0.0	0.4	0.4	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
	682	682									804	804									0	0

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Broward County
Northwest Regional Library
AHU-3: BAS System Check-Out

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential: Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential: Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: CV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 100% — Not applicable to "CV"

Total fan motor hp: 7.5 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	55 MBtu/hr	Full load cooling:	22.5 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 2,387 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 63,864 kWh
Baseline Heating Energy: 4,203 kWh (Electric Conversion)
EFLHs: 2647 049 Hours
Utility Baseline: 1401120 kWh
AC Usage: 5% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	8	Unoccupied setback ends:	8	
Unoccupied setback begins:	19	Unoccupied setback begins:	19	
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	74°	
Cooling setup temperature:	80°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	60°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Occupied Cooling

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
97.5°	4.0	4.0	100%	99%	100%	100%	4.7	4.7	25.7	25.4
92.5°	175.8	175.8	83%	80%	100%	100%	4.7	4.7	21.4	20.7
87.5°	877.9	877.9	65%	62%	100%	100%	4.7	4.7	16.7	15.9
82.5°	1047.6	1047.6	46%	43%	100%	100%	4.7	4.7	11.9	11.1
77.5°	720.4	720.4	28%	25%	100%	100%	4.7	4.7	7.1	6.4
72.5°	308.5	308.5	9%	6%	100%	100%	4.7	4.7	2.4	1.6
67.5°	110.8	110.8	0%	0%	100%	100%	4.7	4.7	0.0	0.0
62.5°	55.0	55.0	0%	0%	100%	100%	4.7	4.7	0.0	0.0
57.5°	23.4	23.4	0%	0%	100%	100%	4.7	4.7	0.0	0.0
52.5°	8.8	8.8	0%	0%	100%	100%	4.7	4.7	0.0	0.0
47.5°	2.1	2.1	0%	0%	100%	100%	4.7	4.7	0.0	0.0
42.5°	0.4	0.4	0%	0%	100%	100%	4.7	4.7	0.0	0.0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
	3,336	3,336								

Unoccupied Cooling / Savings

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (off)	ConstVol Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings Fan (kWh)	Savings Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	91%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	74%	74%			0.0	0.0	0.0	0.0	0	1
92.5°	6.3	6.3	57%	57%	100%	100%	0.0	0.0	14.6	14.6	0	134
87.5°	221.1	221.1	40%	40%	100%	100%	0.0	0.0	10.3	10.3	0	660
82.5°	1137.4	1137.4	23%	23%	100%	100%	0.0	0.0	6.0	6.0	0	798
77.5°	1291.6	1291.6	6%	6%	100%	100%	0.0	0.0	1.6	1.6	0	549
72.5°	700.5	700.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	208
67.5°	279.3	279.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
62.5°	145.0	145.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
57.5°	86.6	86.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
52.5°	43.3	43.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
47.5°	17.9	17.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
42.5°	6.6	6.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
37.5°	1.0	1.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,937	3,937									0	2,387

Occupied Heating

Bin Average (°F)	Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
87.5°	4.0	4.0	0%	0%	100%	100%	4.7	4.7	0.0	0.0
82.5°	72.6	72.6	0%	0%	100%	100%	4.7	4.7	0.0	0.0
77.5°	223.8	223.8	0%	0%	100%	100%	4.7	4.7	0.0	0.0
72.5°	175.5	175.5	0%	0%	100%	100%	4.7	4.7	0.0	0.0
67.5°	87.6	87.6	0%	0%	100%	100%	4.7	4.7	0.0	0.0
62.5°	58.1	58.1	10%	10%	100%	100%	4.7	4.7	0.1	0.1
57.5°	33.5	33.5	30%	30%	100%	100%	4.7	4.7	0.2	0.2
52.5°	18.5	18.5	50%	50%	100%	100%	4.7	4.7	0.3	0.3
47.5°	6.6	6.6	70%	70%	100%	100%	4.7	4.7	0.4	0.4
42.5°	1.8	1.8	90%	90%	100%	100%	4.7	4.7	0.5	0.5
37.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
32.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5
	682	682								

Unoccupied Heating / Savings

Bin Average (°F)	Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (off)	ConstVol Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings Fan (kWh)	Savings Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	6.4	6.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
77.5°	117.3	117.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
72.5°	266.5	266.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
67.5°	147.4	147.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
62.5°	87.9	87.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
57.5°	75.5	75.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
52.5°	53.5	53.5	16%	16%	100%	100%	0.0	0.0	0.1	0.1	0	0
47.5°	32.4	32.4	35%	35%	100%	100%	0.0	0.0	0.2	0.2	0	0
42.5°	11.3	11.3	53%	53%	100%	100%	0.0	0.0	0.3	0.3	0	0
37.5°	4.0	4.0	71%	71%	100%	100%	0.0	0.0	0.4	0.4	0	0
32.5°	2.0	2.0	89%	89%	100%	100%	0.0	0.0	0.5	0.5	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
	804	804									0	0

Broward County

Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Broward County
Northwest Regional Library
AHU-4: BAS System Check-Out

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 30.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	331 MBtu/hr	Full load cooling:	75.7 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 9,206 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 172,119 kWh
Baseline Heating Energy: 6,600 kWh (Electric Conversion)

EFLHs: [illegible] Hours

Utility Baseline: 1401120 kWh
AC Usage: 13% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	8	Unoccupied setback ends:	8	
Unoccupied setback begins:	19	Unoccupied setback begins:	19	
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	74°	
Cooling setup temperature:	80°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	60°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
97.5°	4.0	4.0	100%	99%	100%	99%	19.4	18.6	86.5	85.5
92.5°	175.8	175.8	83%	80%	83%	80%	11.4	10.3	72.1	69.5
87.5°	877.9	877.9	65%	62%	65%	62%	5.8	4.9	56.0	53.5
82.5°	1047.6	1047.6	46%	43%	46%	43%	2.2	1.9	40.0	37.5
77.5°	720.4	720.4	28%	25%	30%	30%	0.7	0.7	24.0	21.5
72.5°	309.5	309.5	9%	6%	30%	30%	0.7	0.7	8.0	5.4
67.5°	110.0	110.0	0%	0%	30%	30%	0.7	0.7	0.0	0.0
62.5°	55.0	55.0	0%	0%	30%	30%	0.7	0.7	0.0	0.0
57.5°	23.4	23.4	0%	0%	30%	30%	0.7	0.7	0.0	0.0
52.5°	8.8	8.8	0%	0%	30%	30%	0.7	0.7	0.0	0.0
47.5°	2.1	2.1	0%	0%	30%	30%	0.7	0.7	0.0	0.0
42.5°	0.4	0.4	0%	0%	30%	30%	0.7	0.7	0.0	0.0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
	3,336	3,336								

Bin Average (°F)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (off)	VFD Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Savings: Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	91%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	74%	74%			0.0	0.0	0.0	0.0	3	4
92.5°	6.3	6.3	57%	57%	57%	57%	0.0	0.0	49.2	49.2	199	450
87.5°	221.1	221.1	40%	40%	40%	40%	0.0	0.0	34.6	34.6	604	2,240
82.5°	1137.4	1137.4	23%	23%	30%	30%	0.0	0.0	20.1	20.1	373	2,684
77.5°	1291.6	1291.6	6%	6%	30%	30%	0.0	0.0	5.5	5.5	0	1,346
72.5°	700.5	700.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	793
67.5°	279.3	279.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	145.0	145.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	86.6	86.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	43.3	43.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
47.5°	17.9	17.9	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
42.5°	6.6	6.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	1.0	1.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,937	3,937									1,179	8,027

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
87.5°	4.0	4.0	0%	0%	30%	30%	0.7	0.7	0.0	0.0
82.5°	72.6	72.6	0%	0%	30%	30%	0.7	0.7	0.0	0.0
77.5°	223.8	223.8	0%	0%	30%	30%	0.7	0.7	0.0	0.0
72.5°	175.5	175.5	0%	0%	30%	30%	0.7	0.7	0.0	0.0
67.5°	87.6	87.6	0%	0%	30%	30%	0.7	0.7	0.0	0.0
62.5°	58.1	58.1	10%	10%	30%	30%	0.7	0.7	0.3	0.3
57.5°	33.5	33.5	30%	30%	30%	30%	0.7	0.7	1.0	1.0
52.5°	18.5	18.5	50%	50%	50%	50%	2.7	2.7	1.7	1.7
47.5°	6.6	6.6	70%	70%	70%	70%	6.9	6.9	2.3	2.3
42.5°	1.8	1.8	90%	90%	90%	90%	14.3	14.3	3.0	3.0
37.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
32.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
27.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
22.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
17.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
12.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
7.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
2.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
-2.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
-7.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
-12.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3
	682	682								

Bin Average (°F)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (off)	VFD Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Savings: Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	6.4	6.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	117.3	117.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
72.5°	266.5	266.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
67.5°	147.4	147.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	87.9	87.9	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	75.5	75.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	53.5	53.5	16%	16%	30%	30%	0.0	0.0	0.5	0.5	0	0
47.5°	32.4	32.4	35%	35%	35%	35%	0.0	0.0	1.1	1.1	0	0
42.5°	11.3	11.3	53%	53%	53%	53%	0.0	0.0	1.7	1.7	0	0
37.5°	4.0	4.0	71%	71%	71%	71%	0.0	0.0	2.3	2.3	0	0
32.5°	2.0	2.0	89%	89%	89%	89%	0.0	0.0	2.9	2.9	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	3.3	3.3	0	0
	804	804									0	0

Broward County
Northwest Regional Library
AHU-5: BAS System Check-Out

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential: Setup load = MIN((OAT - Lag*(Setup T - Space T)- Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential: Setback load = MIN(Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: CV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 100% — Not applicable to "CV"

Total fan motor hp: 5.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	41 MBtu/hr	Full load cooling:	13.8 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 1,467 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints (If <1, reduces load change.)

Baseline Cooling Energy: 40,079 kWh
Baseline Heating Energy: 2,885 kWh (Electric Conversion)
EFLHs: 2717.607 Hours
Utility Baseline: 1401120 kWh
AC Usage: 3% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	8	Unoccupied setback ends:	8	
Unoccupied setback begins:	19	Unoccupied setback begins:	19	
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	74°	
Cooling setup temperature:	80°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	60°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Occupied Cooling

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
97.5°	4.0	4.0	100%	99%	100%	100%	3.1	3.1	15.8	15.6
92.5°	175.8	175.8	83%	80%	100%	100%	3.1	3.1	13.2	12.7
87.5°	877.9	877.9	65%	62%	100%	100%	3.1	3.1	10.2	9.8
82.5°	1047.6	1047.6	46%	43%	100%	100%	3.1	3.1	7.3	6.9
77.5°	720.4	720.4	28%	25%	100%	100%	3.1	3.1	4.4	3.9
72.5°	309.5	309.5	9%	6%	100%	100%	3.1	3.1	1.5	1.0
67.5°	110.0	110.0	0%	0%	100%	100%	3.1	3.1	0.0	0.0
62.5°	55.0	55.0	0%	0%	100%	100%	3.1	3.1	0.0	0.0
57.5°	23.4	23.4	0%	0%	100%	100%	3.1	3.1	0.0	0.0
52.5°	8.8	8.8	0%	0%	100%	100%	3.1	3.1	0.0	0.0
47.5°	2.1	2.1	0%	0%	100%	100%	3.1	3.1	0.0	0.0
42.5°	0.4	0.4	0%	0%	100%	100%	3.1	3.1	0.0	0.0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
	3,336	3,336								

Unoccupied Cooling / Savings

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (off)	ConstVol Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings Fan (kWh)	Savings Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	91%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	74%	74%			0.0	0.0	0.0	0.0	0	1
92.5°	6.3	6.3	57%	57%	100%	100%	0.0	0.0	9.0	9.0	0	82
87.5°	221.1	221.1	40%	40%	100%	100%	0.0	0.0	6.3	6.3	0	411
82.5°	1137.4	1137.4	23%	23%	100%	100%	0.0	0.0	3.7	3.7	0	491
77.5°	1291.6	1291.6	6%	6%	100%	100%	0.0	0.0	1.0	1.0	0	337
72.5°	700.5	700.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	145
67.5°	279.3	279.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
62.5°	145.0	145.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
57.5°	86.6	86.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
52.5°	43.3	43.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
47.5°	17.9	17.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
42.5°	6.6	6.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
37.5°	1.0	1.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,937	3,937									0	1,467

Occupied Heating

Bin Average (°F)	Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
87.5°	4.0	4.0	0%	0%	100%	100%	3.1	3.1	0.0	0.0
82.5°	72.6	72.6	0%	0%	100%	100%	3.1	3.1	0.0	0.0
77.5°	223.8	223.8	0%	0%	100%	100%	3.1	3.1	0.0	0.0
72.5°	175.5	175.5	0%	0%	100%	100%	3.1	3.1	0.0	0.0
67.5°	87.6	87.6	0%	0%	100%	100%	3.1	3.1	0.0	0.0
62.5°	58.1	58.1	10%	10%	100%	100%	3.1	3.1	0.0	0.0
57.5°	33.5	33.5	30%	30%	100%	100%	3.1	3.1	0.1	0.1
52.5°	18.5	18.5	50%	50%	100%	100%	3.1	3.1	0.2	0.2
47.5°	6.6	6.6	70%	70%	100%	100%	3.1	3.1	0.3	0.3
42.5°	1.8	1.8	90%	90%	100%	100%	3.1	3.1	0.4	0.4
37.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
32.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4
	682	682								

Unoccupied Heating / Savings

Bin Average (°F)	Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (off)	ConstVol Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings Fan (kWh)	Savings Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	6.4	6.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
77.5°	117.3	117.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
72.5°	266.5	266.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
67.5°	147.4	147.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
62.5°	87.9	87.9	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
57.5°	75.5	75.5	0%	0%	100%	100%	0.0	0.0	0.0	0.0	0	0
52.5°	53.5	53.5	16%	16%	100%	100%	0.0	0.0	0.1	0.1	0	0
47.5°	32.4	32.4	35%	35%	100%	100%	0.0	0.0	0.1	0.1	0	0
42.5°	11.3	11.3	53%	53%	100%	100%	0.0	0.0	0.2	0.2	0	0
37.5°	4.0	4.0	71%	71%	100%	100%	0.0	0.0	0.3	0.3	0	0
32.5°	2.0	2.0	89%	89%	100%	100%	0.0	0.0	0.4	0.4	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.4	0.4	0	0
	804	804									0	0

OPTERRA
An ENGIE company

Split System - Savings Summary

Facility	NW Regional Library
Unit Location	Roof

Existing Conditions

Mfg	Trane
Model #	TTP030D100A0
Date Mfg	2000

Baseline Data

Peak kW	420
kWh	1,401,120

Proposed Conditions

Mfg	
Model #	

Energy Usage

Existing Conditions

00-08 Hrs	2.8	kW	587	kWh	0	Therms
09-16 Hrs	2.8	kW	558	kWh	0	Therms
17-00 Hrs	2.8	kW	394	kWh	0	Therms
Total	**2.8**	**kW**	**1,539**	**kWh**	**0**	**Therms**
	0.7%		*0.1%*			

Proposed Conditions

00-08 Hrs	2.7	kW	262	kWh	0	Therms
09-16 Hrs	2.7	kW	499	kWh	0	Therms
17-00 Hrs	2.7	kW	352	kWh	0	Therms
Total	**2.7**	**kW**	**1,113**	**kWh**	**0**	**Therms**
	0.6%		*0.1%*			

Unadjusted Annual Savings		
	0.1	kW
	426	kWh
	0	Therms

Adjusted for BAS	
0.1	**kW**
426	**kWh**

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	NW Regional Library
Unit Location	Roof
Mfg	Trane
Model #	TTP030D100A0

**RED TEXT IS INPUT

Estimated SF Served by Unit	163	SF	
Max Cooling Load	8.2	kbtu/hr	200SF/Ton
Max Heating Load	1.9	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	37	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	38	deg-F	
Inside Heating Design Temp	38	deg-F	
Ktot - Cooling	316.6	btu/h-degF	
Tbal - Cooling	68.0	deg-F	
Ktot - Heating	-68.3	btu/h-degF	
Tbal - Heating	68.0	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	10.7	New EER/SEER/IPLV	
	1.121	kW/Ton	
	17	Age of Unit (yrs)	
	3.05	Full Load kW(degraded 0.5% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	17	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	0.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2000		

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	34.0	0	10.8	28.1	1.000	28.1	3.05	0.38	0
97	29.0	0	9.2	29.3	1.000	29.3	3.05	0.31	0
92	24.0	0	7.6	30.5	1.000	30.5	3.05	0.25	0
87	19.0	54	6.0	31.6	1.000	31.6	3.05	0.19	31
82	14.0	643	4.4	32.8	1.000	32.8	3.05	0.14	265
77	9.0	869	2.8	34.0	1.000	34.0	3.05	0.08	222
72	4.0	624	1.3	35.1	1.000	35.1	3.05	0.04	69
		2,190							587

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	165	-0.4	0.0	1.000	0.0	0.00	-34.94	0	-0.42	-0.12	0
57	11.0	123	-0.8	0.0	1.000	0.0	0.00	-67.57	0	-0.76	-0.22	0
52	16.0	80	-1.1	0.0	1.000	0.0	0.00	-103.98	0	-1.10	-0.32	0
47	21.0	43	-1.4	0.0	1.000	0.0	0.00	-144.69	0	-1.44	-0.42	0
42	26.0	15	-1.8	0.0	1.000	0.0	0.00	-191.16	0	-1.79	-0.52	0
37	31.0	5	-2.1	0.0	1.000	0.0	0.00	-243.94	0	-2.13	-0.62	0
32	36.0	2	-2.5	0.0	1.000	0.0	0.00	-304.70	0	-2.47	-0.72	0
27	41.0	0	-2.8	0.0	1.000	0.0	0.00	-375.39	0	-2.81	-0.82	0
22	46.0	0	-3.1	0.0	1.000	0.0	0.00	-458.68	0	-3.15	-0.92	0
17	51.0	0	-3.5	0.0	1.000	0.0	0.00	-558.25	0	-3.49	-1.02	0
12	56.0	0	-3.8	0.0	1.000	0.0	0.00	-679.40	0	-3.83	-1.12	0
		433							0			0

Total Cooling kW Demand	2.8	kW
Total Cooling kWh Consumption	587	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	NW Regional Library
Unit Location	Roof
Mfg	Trane
Model #	TTP030D100A0

RED TEXT IS INPUT

Estimated SF Served by Unit	153	SF	
Max Cooling Load	4.6	kbtu/hr	400SF/Ton
Max Heating Load	6.1	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg-F	
Inside Heating Design Temp	68	deg F	
Ktot - Cooling	150.0	btu/h-degF	
Tbal - Cooling	68.0	deg F	
Ktot - Heating	218.6	btu/h-degF	
Tbal - Heating	68.0	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	10.7	New EER/SEER/IPLV	
	1.121	kW/Ton	
	17	Age of Unit (yrs)	
	3.05	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	17	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	5.4	28.1	1.000	28.1	3.05	0.19	0.00	0
97	29.0	5	4.8	29.3	1.000	29.3	3.05	0.16	0.02	2
92	24.0	174	3.8	30.5	1.000	30.5	3.05	0.12	0.66	66
87	19.0	787	3.0	31.6	1.000	31.6	3.05	0.10	2.37	228
82	14.0	816	2.2	32.8	1.000	32.8	3.05	0.07	1.81	168
77	9.0	609	1.4	34.0	1.000	34.0	3.05	0.04	0.87	78
72	4.0	278	0.8	35.1	1.000	35.1	3.05	0.02	0.18	15
		2,669							5.90	558

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	70	-1.3	0.0	1.000	0.0	0.00	-111.80	-0.92	0	-1.32	-0.39	0
57	11.0	34	-2.4	0.0	1.000	0.0	0.00	-216.21	-0.08	0	-2.42	-0.71	0
52	16.0	17	-3.5	0.0	1.000	0.0	0.00	-332.74	-0.06	0	-3.51	-1.03	0
47	21.0	5	-4.6	0.0	1.000	0.0	0.00	-463.64	-0.02	0	-4.60	-1.35	0
42	26.0	2	-5.7	0.0	1.000	0.0	0.00	-611.72	-0.01	0	-5.69	-1.67	0
37	31.0	1	-6.8	0.0	1.000	0.0	0.00	-780.61	-0.01	0	-6.78	-1.99	0
32	36.0	0	-7.9	0.0	1.000	0.0	0.00	-975.04	0.00	0	-7.88	-2.31	0
27	41.0	0	-9.0	0.0	1.000	0.0	0.00	-1,201.26	0.00	0	-8.97	-2.63	0
22	46.0	0	-10.1	0.0	1.000	0.0	0.00	-1,467.78	0.00	0	-10.06	-2.95	0
17	51.0	0	-11.1	0.0	1.000	0.0	0.00	-1,786.40	0.00	0	-11.15	-3.27	0
12	56.0	0	-12.2	0.0	1.000	0.0	0.00	-2,174.07	0.00	0	-12.25	-3.59	0
		129								0			0

Total Cooling kW Demand	2.8	kW
Total Cooling kWh Consumption	558	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	NW Regional Library
Unit Location	Roof
Mfg	Trane
Model #	TTP030D100A0

RED TEXT IS INPUT

Estimated SF Served by Unit	153	SF	
Max Cooling Load	4.6	kbtu/hr	400SF/Ton
Max Heating Load	6.1	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg-F	
Inside Heating Design Temp	68	deg-F	
Ktot - Cooling	160.0	btu/h-degF	
Tbal - Cooling	68.0	deg-F	
Ktot - Heating	-210.6	btu/h-degF	
Tbal - Heating	68.0	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	10.7	New EER/SEER/IPLV	
	1.121	kW/Ton	
	17	Age of Unit (yrs)	
	3.05	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	17	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	5.4	28.1	1.000	28.1	3.05	0.19	0.00	0
97	29.0	1	4.6	29.3	1.000	29.3	3.05	0.16	0.00	0
92	24.0	11	3.8	30.5	1.000	30.5	3.05	0.12	0.04	4
87	19.0	275	3.0	31.6	1.000	31.6	3.05	0.10	0.83	80
82	14.0	821	2.2	32.8	1.000	32.8	3.05	0.07	1.82	169
77	9.0	862	1.4	34.0	1.000	34.0	3.05	0.04	1.23	110
72	4.0	539	0.6	35.1	1.000	35.1	3.05	0.02	0.34	30
		2,509							4.26	394

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	106	-1.3	0.0	1.000	0.0	0.00	-111.80	-0.14	0	-1.32	-0.39	0
57	11.0	60	-2.4	0.0	1.000	0.0	0.00	-216.21	-0.14	0	-2.42	-0.71	0
52	16.0	31	-3.5	0.0	1.000	0.0	0.00	-332.74	-0.11	0	-3.51	-1.03	0
47	21.0	10	-4.6	0.0	1.000	0.0	0.00	-463.64	-0.05	0	-4.60	-1.35	0
42	26.0	3	-5.7	0.0	1.000	0.0	0.00	-611.72	-0.02	0	-5.69	-1.67	0
37	31.0	1	-6.8	0.0	1.000	0.0	0.00	-780.61	-0.01	0	-6.79	-1.99	0
32	36.0	0	-7.9	0.0	1.000	0.0	0.00	-975.04	0.00	0	-7.88	-2.31	0
27	41.0	0	-9.0	0.0	1.000	0.0	0.00	-1,201.26	0.00	0	-8.97	-2.63	0
22	46.0	0	-10.1	0.0	1.000	0.0	0.00	-1,467.78	0.00	0	-10.06	-2.95	0
17	51.0	0	-11.1	0.0	1.000	0.0	0.00	-1,786.40	0.00	0	-11.15	-3.27	0
12	56.0	0	-12.2	0.0	1.000	0.0	0.00	-2,174.07	0.00	0	-12.25	-3.59	0
		211								0			0

Total Cooling kW Demand	2.8	kW
Total Cooling kWh Consumption	394	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage

00 Hour - 08 Hour: Proposed Conditions

Facility NW Regional Library
Unit Location Roof
Mfg
Model #

**RED TEXT IS INPUT

Estimated SF Served by Unit	153	SF	
Max Cooling Load	4.6	kbtu/hr	400SF/Ton
Max Heating Load	1.9	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg F	
Inside Heating Design Temp	68	deg-F	
Ktot - Cooling	158.3	btu/h.degF	
Tbal - Cooling	68.0	deg-F	
Ktot - Heating	68.3	btu/h.degF	
Tbal - Heating	68.0	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	2.73	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	11	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	5.4	28.1	1.000	28.1	2.73	0.19	0.00	0
97	29.0	0	4.6	29.3	1.000	29.3	2.73	0.16	0.00	0
92	24.0	0	3.8	30.5	1.000	30.5	2.73	0.12	0.00	0
87	19.0	54	3.0	31.6	1.000	31.6	2.73	0.10	0.16	14
82	14.0	643	2.2	32.8	1.000	32.8	2.73	0.07	1.42	118
77	9.0	869	1.4	34.0	1.000	34.0	2.73	0.04	1.24	99
72	4.0	624	0.6	35.1	1.000	35.1	2.73	0.02	0.40	31
		2,190							3.22	262

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	165	-0.4	0.0	1.000	0.0	0.00	-34.94	-0.07	0	-0.42	-0.12	0
57	11.0	123	-0.8	0.0	1.000	0.0	0.00	-67.57	-0.09	0	-0.76	-0.22	0
52	16.0	80	-1.1	0.0	1.000	0.0	0.00	-103.98	-0.09	0	-1.10	-0.32	0
47	21.0	43	-1.4	0.0	1.000	0.0	0.00	-144.89	-0.06	0	-1.44	-0.42	0
42	26.0	15	-1.8	0.0	1.000	0.0	0.00	-191.16	-0.03	0	-1.79	-0.52	0
37	31.0	5	-2.1	0.0	1.000	0.0	0.00	-243.94	-0.01	0	-2.13	-0.62	0
32	36.0	2	-2.5	0.0	1.000	0.0	0.00	-304.70	0.00	0	-2.47	-0.72	0
27	41.0	0	-2.8	0.0	1.000	0.0	0.00	-375.39	0.00	0	-2.81	-0.82	0
22	46.0	0	-3.1	0.0	1.000	0.0	0.00	-458.68	0.00	0	-3.15	-0.92	0
17	51.0	0	-3.5	0.0	1.000	0.0	0.00	-558.25	0.00	0	-3.49	-1.02	0
12	56.0	0	-3.8	0.0	1.000	0.0	0.00	-679.40	0.00	0	-3.83	-1.12	0
		433								0			0

Total Cooling kW Demand	2.7	kW
Total Cooling kWh Consumption	262	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	NW Regional Library
Unit Location	Roof
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	153	SF	
Max Cooling Load	4.6	kbtu/hr	400SF/Ton
Max Heating Load	6.1	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg F	
Inside Heating Design Temp	68	deg F	
Ktot - Cooling	150.0	btu/h-degF	
Tbal - Cooling	68.0	deg F	
Ktot - Heating	218.6	btu/h-degF	
Tbal - Heating	68.0	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	2.73	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	5.4	28.1	1.000	28.1	2.73	0.19	0.00	0
97	29.0	5	4.6	29.3	1.000	29.3	2.73	0.16	0.02	2
92	24.0	174	3.8	30.5	1.000	30.5	2.73	0.12	0.66	59
87	19.0	787	3.0	31.6	1.000	31.6	2.73	0.10	2.37	204
82	14.0	816	2.2	32.8	1.000	32.8	2.73	0.07	1.81	150
77	9.0	609	1.4	34.0	1.000	34.0	2.73	0.04	0.87	70
72	4.0	278	0.6	35.1	1.000	35.1	2.73	0.02	0.18	14
		2,669							5.90	499

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	70	-1.3	0.0	1.000	0.0	0.00	-111.80	-0.09	0	-1.32	-0.39	0
57	11.0	34	-2.4	0.0	1.000	0.0	0.00	-216.21	-0.08	0	-2.42	-0.71	0
52	16.0	17	-3.5	0.0	1.000	0.0	0.00	-332.74	-0.06	0	-3.51	-1.03	0
47	21.0	5	-4.6	0.0	1.000	0.0	0.00	-463.64	-0.02	0	-4.60	-1.35	0
42	26.0	2	-5.7	0.0	1.000	0.0	0.00	-611.72	-0.01	0	-5.69	-1.67	0
37	31.0	1	-6.8	0.0	1.000	0.0	0.00	-780.61	-0.01	0	-6.78	-1.99	0
32	36.0	0	-7.9	0.0	1.000	0.0	0.00	-975.04	0.00	0	-7.88	-2.31	0
27	41.0	0	-9.0	0.0	1.000	0.0	0.00	-1,201.26	0.00	0	-8.97	-2.63	0
22	46.0	0	-10.1	0.0	1.000	0.0	0.00	-1,467.78	0.00	0	-10.06	-2.95	0
17	51.0	0	-11.1	0.0	1.000	0.0	0.00	-1,786.40	0.00	0	-11.15	-3.27	0
12	56.0	0	-12.2	0.0	1.000	0.0	0.00	-2,174.07	0.00	0	-12.25	-3.59	0
		129								0			0

Total Cooling kW Demand	2.7	kW
Total Cooling kWh Consumption	499	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	NW Regional Library'
Unit Location	Roof
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	153	SF	
Max Cooling Load	4.6	kbtu/hr	400SF/Ton
Max Heating Load	6.1	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg F	
Inside Heating Design Temp	68	deg F	
Ktot - Cooling	150.0	btu/h-degF	
Tbal - Cooling	68.0	deg F	
Ktot - Heating	218.6	btu/h-degF	
Tbal - Heating	68.0	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	2.73	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	5.4	28.1	1.000	28.1	2.73	0.19	0.00	0
97	29.0	1	4.6	29.3	1.000	29.3	2.73	0.16	0.00	0
92	24.0	11	3.8	30.5	1.000	30.5	2.73	0.12	0.04	4
87	19.0	275	3.0	31.6	1.000	31.6	2.73	0.10	0.83	71
82	14.0	821	2.2	32.8	1.000	32.8	2.73	0.07	1.82	151
77	9.0	862	1.4	34.0	1.000	34.0	2.73	0.04	1.23	99
72	4.0	539	0.6	35.1	1.000	35.1	2.73	0.02	0.34	26
		2,509							4.26	352

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	106	-1.3	0.0	1.000	0.0	0.00	-111.80	-0.14	0	-1.32	-0.39	0
57	11.0	60	-2.4	0.0	1.000	0.0	0.00	-216.21	-0.14	0	-2.42	-0.71	0
52	16.0	31	-3.5	0.0	1.000	0.0	0.00	-332.74	-0.11	0	-3.51	-1.03	0
47	21.0	10	-4.6	0.0	1.000	0.0	0.00	-463.64	-0.05	0	-4.60	-1.35	0
42	26.0	3	-5.7	0.0	1.000	0.0	0.00	-611.72	-0.02	0	-5.69	-1.67	0
37	31.0	1	-6.8	0.0	1.000	0.0	0.00	-780.61	-0.01	0	-6.79	-1.99	0
32	36.0	0	-7.9	0.0	1.000	0.0	0.00	-975.04	0.00	0	-7.88	-2.31	0
27	41.0	0	-9.0	0.0	1.000	0.0	0.00	-1,201.26	0.00	0	-8.97	-2.63	0
22	46.0	0	-10.1	0.0	1.000	0.0	0.00	-1,467.78	0.00	0	-10.06	-2.95	0
17	51.0	0	-11.1	0.0	1.000	0.0	0.00	-1,786.40	0.00	0	-11.15	-3.27	0
12	56.0	0	-12.2	0.0	1.000	0.0	0.00	-2,174.07	0.00	0	-12.25	-3.59	0
		211								0			0

Total Cooling kW Demand	2.7	kW
Total Cooling kWh Consumption	352	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split System - Savings Summary

Facility NW Regional Library
Unit Location Roof

Existing Conditions
Mfg Trane
Model # TTP024C100A3
Date Mfg 2000

Baseline Data

Peak kW	420
kWh	1,401,120

Proposed Conditions
Mfg
Model #

Energy Usage

Existing Conditions

00-08 Hrs	2.8	kW	488	kWh	0	Therms
09-16 Hrs	2.8	kW	463	kWh	0	Therms
17-00 Hrs	2.8	kW	327	kWh	0	Therms
Total	**2.8**	**kW**	**1,278**	**kWh**	**0**	**Therms**
	0.7%		*0.1%*			

Proposed Conditions

00-08 Hrs	2.7	kW	218	kWh	0	Therms
09-16 Hrs	2.7	kW	414	kWh	0	Therms
17-00 Hrs	2.7	kW	292	kWh	0	Therms
Total	**2.7**	**kW**	**924**	**kWh**	**0**	**Therms**
	0.6%		*0.1%*			

Unadjusted Annual Savings		
	0.1	kW
	354	kWh
	0	Therms

Adjusted for BAS	
0.1	**kW**
354	**kWh**

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	NW Regional Library
Unit Location	Roof
Mfg	Trane
Model #	TTP024C100A3

**RED TEXT IS INPUT

Estimated SF Served by Unit	127	SF	
Max Cooling Load	7.6	kbtu/hr	200SF/Ton
Max Heating Load	1.6	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	38	deg-F	
Inside Heating Design Temp	38	deg-F	
Ktot - Cooling	262.8	btu/h-degF	
Tbal - Cooling	68.0	deg-F	
Ktot - Heating	-56.7	btu/h-degF	
Tbal - Heating	68.0	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	10.7	New EER/SEER/IPLV	
	1.121	kW/Ton	
	17	Age of Unit (yrs)	
	3.05	Full Load kW(degraded 0.5% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	17	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	0.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2000		

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	34.0	0	8.9	28.1	1.000	28.1	3.05	0.32	0
97	29.0	0	7.6	29.3	1.000	29.3	3.05	0.26	0
92	24.0	0	6.3	30.5	1.000	30.5	3.05	0.21	0
87	19.0	54	5.0	31.6	1.000	31.6	3.05	0.16	26
82	14.0	643	3.7	32.8	1.000	32.8	3.05	0.11	220
77	9.0	869	2.4	34.0	1.000	34.0	3.05	0.07	185
72	4.0	624	1.1	35.1	1.000	35.1	3.05	0.03	57
		2,190							488

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	165	-0.3	0.0	1.000	0.0	0.00	-29.00	0	-0.35	-0.10	0
57	11.0	123	-0.6	0.0	1.000	0.0	0.00	-56.08	0	-0.63	-0.19	0
52	16.0	80	-0.9	0.0	1.000	0.0	0.00	-86.31	0	-0.92	-0.27	0
47	21.0	43	-1.2	0.0	1.000	0.0	0.00	-120.27	0	-1.20	-0.35	0
42	26.0	15	-1.5	0.0	1.000	0.0	0.00	-158.68	0	-1.48	-0.43	0
37	31.0	5	-1.8	0.0	1.000	0.0	0.00	-202.49	0	-1.77	-0.52	0
32	36.0	2	-2.0	0.0	1.000	0.0	0.00	-252.92	0	-2.05	-0.60	0
27	41.0	0	-2.3	0.0	1.000	0.0	0.00	-311.60	0	-2.33	-0.68	0
22	46.0	0	-2.6	0.0	1.000	0.0	0.00	-380.74	0	-2.61	-0.77	0
17	51.0	0	-2.9	0.0	1.000	0.0	0.00	-463.38	0	-2.90	-0.85	0
12	56.0	0	-3.2	0.0	1.000	0.0	0.00	-563.94	0	-3.18	-0.93	0
		433							0			0

Total Cooling kW Demand	2.8	kW
Total Cooling kWh Consumption	488	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

OPTERRA
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Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	NW Regional Library
Unit Location	Roof
Mfg	Trane
Model #	TTP024C100A3

**RED TEXT IS INPUT

Estimated SF Served by Unit	137	SF	
Max Cooling Load	3.8	kbtu/hr	400SF/Ton
Max Heating Load	5.1	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg-F	
Inside Heating Design Temp	68	deg F	
Ktot - Cooling	131.4	btu/h-degF	
Tbal - Cooling	68.0	deg F	
Ktot - Heating	101.4	btu/h-degF	
Tbal - Heating	68.0	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	10.7	New EER/SEER/IPLV	
	1.121	kW/Ton	
	17	Age of Unit (yrs)	
	3.05	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	17	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	4.5	28.1	1.000	28.1	3.05	0.16	0.00	0
97	29.0	5	3.8	29.3	1.000	29.3	3.05	0.13	0.02	2
92	24.0	174	3.2	30.5	1.000	30.5	3.05	0.10	0.55	55
87	19.0	787	2.5	31.6	1.000	31.6	3.05	0.08	1.96	190
82	14.0	816	1.8	32.8	1.000	32.8	3.05	0.06	1.50	140
77	9.0	609	1.2	34.0	1.000	34.0	3.05	0.03	0.72	65
72	4.0	278	0.5	35.1	1.000	35.1	3.05	0.01	0.15	13
		2,669							4.90	463

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	70	-1.1	0.0	1.000	0.0	0.00	-92.80	-0.76	0	-1.10	-0.32	0
57	11.0	34	-2.0	0.0	1.000	0.0	0.00	-179.47	-0.07	0	-2.01	-0.59	0
52	16.0	17	-2.9	0.0	1.000	0.0	0.00	-276.20	-0.05	0	-2.91	-0.85	0
47	21.0	5	-3.8	0.0	1.000	0.0	0.00	-384.85	-0.02	0	-3.82	-1.12	0
42	26.0	2	-4.7	0.0	1.000	0.0	0.00	-507.77	-0.01	0	-4.73	-1.38	0
37	31.0	1	-5.8	0.0	1.000	0.0	0.00	-647.98	-0.01	0	-5.83	-1.65	0
32	36.0	0	-6.5	0.0	1.000	0.0	0.00	-809.35	0.00	0	-6.54	-1.92	0
27	41.0	0	-7.4	0.0	1.000	0.0	0.00	-997.13	0.00	0	-7.45	-2.18	0
22	46.0	0	-8.3	0.0	1.000	0.0	0.00	-1,218.35	0.00	0	-8.35	-2.45	0
17	51.0	0	-9.3	0.0	1.000	0.0	0.00	-1,482.83	0.00	0	-9.26	-2.71	0
12	56.0	0	-10.2	0.0	1.000	0.0	0.00	-1,804.62	0.00	0	-10.17	-2.98	0
		129								0			0

Total Cooling kW Demand	2.8	kW
Total Cooling kWh Consumption	463	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	NW Regional Library
Unit Location	Roof
Mfg	Trane
Model #	TTP024C100A3

*RED TEXT IS INPUT

Estimated SF Served by Unit	127	SF	
Max Cooling Load	3.8	kbtu/hr	400SF/Ton
Max Heating Load	5.1	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg-F	
Inside Heating Design Temp	68	deg-F	
Ktot - Cooling	131.4	btu/h-degF	
Tbal - Cooling	68.0	deg-F	
Ktot - Heating	101.4	btu/h-degF	
Tbal - Heating	68.0	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	10.7	New EER/SEER/IPLV	
	1.121	kW/Ton	
	17	Age of Unit (yrs)	
	3.05	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	17	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	4.5	28.1	1.000	28.1	3.05	0.16	0.00	0
97	29.0	1	3.8	29.3	1.000	29.3	3.05	0.13	0.00	0
92	24.0	11	3.2	30.5	1.000	30.5	3.05	0.10	0.03	3
87	19.0	275	2.5	31.6	1.000	31.6	3.05	0.08	0.69	66
82	14.0	821	1.8	32.8	1.000	32.8	3.05	0.06	1.51	140
77	9.0	862	1.2	34.0	1.000	34.0	3.05	0.03	1.02	92
72	4.0	539	0.5	35.1	1.000	35.1	3.05	0.01	0.28	25
		2,509							3.54	327

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	106	-1.1	0.0	1.000	0.0	0.00	-92.80	-0.12	0	-1.10	-0.32	0
57	11.0	60	-2.0	0.0	1.000	0.0	0.00	-179.47	-0.12	0	-2.01	-0.59	0
52	16.0	31	-2.9	0.0	1.000	0.0	0.00	-276.20	-0.09	0	-2.91	-0.85	0
47	21.0	10	-3.8	0.0	1.000	0.0	0.00	-384.85	-0.04	0	-3.82	-1.12	0
42	26.0	3	-4.7	0.0	1.000	0.0	0.00	-507.77	-0.01	0	-4.73	-1.38	0
37	31.0	1	-5.6	0.0	1.000	0.0	0.00	-647.96	-0.01	0	-5.63	-1.65	0
32	36.0	0	-6.5	0.0	1.000	0.0	0.00	-809.35	0.00	0	-6.54	-1.92	0
27	41.0	0	-7.4	0.0	1.000	0.0	0.00	-997.13	0.00	0	-7.45	-2.18	0
22	46.0	0	-8.3	0.0	1.000	0.0	0.00	-1,218.35	0.00	0	-8.35	-2.45	0
17	51.0	0	-9.3	0.0	1.000	0.0	0.00	-1,482.83	0.00	0	-9.26	-2.71	0
12	56.0	0	-10.2	0.0	1.000	0.0	0.00	-1,804.62	0.00	0	-10.17	-2.98	0
		211								0			0

Total Cooling kW Demand	2.8	kW
Total Cooling kWh Consumption	327	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

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Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility NW Regional Library
Unit Location Roof
Mfg
Model #

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	11	

**RED TEXT IS INPUT

Estimated SF Served by Unit	127	SF	
Max Cooling Load	3.8	kbtu/hr	400SF/Ton
Max Heating Load	1.6	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	91	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg F	
Inside Heating Design Temp	68	deg-F	
Ktot - Cooling	131.4	btu/h.degF	
Tbal - Cooling	68.0	deg-F	
Ktot - Heating	56.7	btu/h.degF	
Tbal - Heating	68.0	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	2.73	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	4.5	28.1	1.000	28.1	2.73	0.16	0.00	0
97	29.0	0	3.8	29.3	1.000	29.3	2.73	0.13	0.00	0
92	24.0	0	3.2	30.5	1.000	30.5	2.73	0.10	0.00	0
87	19.0	54	2.5	31.6	1.000	31.6	2.73	0.08	0.13	12
82	14.0	643	1.8	32.8	1.000	32.8	2.73	0.06	1.18	98
77	9.0	869	1.2	34.0	1.000	34.0	2.73	0.03	1.03	82
72	4.0	624	0.5	35.1	1.000	35.1	2.73	0.01	0.33	25
		2,190							2.67	218

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	165	-0.3	0.0	1.000	0.0	0.00	-29.00	-0.06	0	-0.35	-0.10	0
57	11.0	123	-0.6	0.0	1.000	0.0	0.00	-56.08	-0.08	0	-0.63	-0.19	0
52	16.0	80	-0.9	0.0	1.000	0.0	0.00	-86.31	-0.07	0	-0.92	-0.27	0
47	21.0	43	-1.2	0.0	1.000	0.0	0.00	-120.27	-0.05	0	-1.20	-0.35	0
42	26.0	15	-1.5	0.0	1.000	0.0	0.00	-158.68	-0.02	0	-1.48	-0.43	0
37	31.0	5	-1.8	0.0	1.000	0.0	0.00	-202.49	-0.01	0	-1.77	-0.52	0
32	36.0	2	-2.0	0.0	1.000	0.0	0.00	-252.92	0.00	0	-2.05	-0.60	0
27	41.0	0	-2.3	0.0	1.000	0.0	0.00	-311.60	0.00	0	-2.33	-0.68	0
22	46.0	0	-2.6	0.0	1.000	0.0	0.00	-380.74	0.00	0	-2.61	-0.77	0
17	51.0	0	-2.9	0.0	1.000	0.0	0.00	-463.38	0.00	0	-2.90	-0.85	0
12	56.0	0	-3.2	0.0	1.000	0.0	0.00	-563.94	0.00	0	-3.18	-0.93	0
		433								0			0

Total Cooling kW Demand	2.7	kW
Total Cooling kWh Consumption	218	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

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Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	NW Regional Library
Unit Location	Roof
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	127	SF	
Max Cooling Load	3.8	kbtu/hr	400SF/Ton
Max Heating Load	5.1	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg-F	
Inside Heating Design Temp	68	deg-F	
Ktot - Cooling	131.4	btu/h-degF	
Tbal - Cooling	68.0	deg F	
Ktot - Heating	101.4	btu/h-degF	
Tbal - Heating	68.0	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	2.73	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	4.5	28.1	1.000	28.1	2.73	0.16	0.00	0
97	29.0	5	3.8	29.3	1.000	29.3	2.73	0.13	0.02	2
92	24.0	174	3.2	30.5	1.000	30.5	2.73	0.10	0.55	49
87	19.0	787	2.5	31.6	1.000	31.6	2.73	0.08	1.96	169
82	14.0	816	1.8	32.8	1.000	32.8	2.73	0.06	1.50	125
77	9.0	609	1.2	34.0	1.000	34.0	2.73	0.03	0.72	58
72	4.0	278	0.5	35.1	1.000	35.1	2.73	0.01	0.15	11
		2,669							4.90	414

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	70	-1.1	0.0	1.000	0.0	0.00	-92.80	-0.08	0	-1.10	-0.32	0
57	11.0	34	-2.0	0.0	1.000	0.0	0.00	-179.47	-0.07	0	-2.01	-0.59	0
52	16.0	17	-2.9	0.0	1.000	0.0	0.00	-276.20	-0.05	0	-2.91	-0.85	0
47	21.0	5	-3.8	0.0	1.000	0.0	0.00	-384.65	-0.02	0	-3.82	-1.12	0
42	26.0	2	-4.7	0.0	1.000	0.0	0.00	-507.77	-0.01	0	-4.73	-1.38	0
37	31.0	1	-5.8	0.0	1.000	0.0	0.00	-647.98	-0.01	0	-5.63	-1.65	0
32	36.0	0	-6.5	0.0	1.000	0.0	0.00	-809.35	0.00	0	-6.54	-1.92	0
27	41.0	0	-7.4	0.0	1.000	0.0	0.00	-997.13	0.00	0	-7.45	-2.18	0
22	46.0	0	-8.3	0.0	1.000	0.0	0.00	-1,218.35	0.00	0	-8.35	-2.45	0
17	51.0	0	-9.3	0.0	1.000	0.0	0.00	-1,482.83	0.00	0	-9.26	-2.71	0
12	56.0	0	-10.2	0.0	1.000	0.0	0.00	-1,804.62	0.00	0	-10.17	-2.98	0
		129								0			0

Total Cooling kW Demand	2.7	kW
Total Cooling kWh Consumption	414	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	NW Regional Library'
Unit Location	Roof
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	127	SF	
Max Cooling Load	3.8	kbtu/hr	400SF/Ton
Max Heating Load	5.1	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	0		
Average internal heat gain	0.0	kbtu/hr	
Inside Cooling Design Temp	68	deg-F	
Inside Heating Design Temp	68	deg F	
Ktot - Cooling	131.4	btu/h-degF	
Tbal - Cooling	68.0	deg F	
Ktot - Heating	101.4	btu/h-degF	
Tbal - Heating	68.0	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	2.73	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	34.0	0	4.5	28.1	1.000	28.1	2.73	0.16	0.00	0
97	29.0	1	3.8	29.3	1.000	29.3	2.73	0.13	0.00	0
92	24.0	11	3.2	30.5	1.000	30.5	2.73	0.10	0.03	3
87	19.0	275	2.5	31.6	1.000	31.6	2.73	0.08	0.69	59
82	14.0	821	1.9	32.8	1.000	32.8	2.73	0.06	1.51	126
77	9.0	862	1.2	34.0	1.000	34.0	2.73	0.03	1.02	82
72	4.0	539	0.5	35.1	1.000	35.1	2.73	0.01	0.28	22
		2,509							3.54	292

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	6.0	106	-1.1	0.0	1.000	0.0	0.00	-92.80	-0.12	0	-1.10	-0.32	0
57	11.0	60	-2.0	0.0	1.000	0.0	0.00	-179.47	-0.12	0	-2.01	-0.59	0
52	16.0	31	-2.9	0.0	1.000	0.0	0.00	-276.20	-0.09	0	-2.91	-0.85	0
47	21.0	10	-3.8	0.0	1.000	0.0	0.00	-384.65	-0.04	0	-3.82	-1.12	0
42	26.0	3	-4.7	0.0	1.000	0.0	0.00	-507.77	-0.01	0	-4.73	-1.38	0
37	31.0	1	-5.6	0.0	1.000	0.0	0.00	-647.98	-0.01	0	-5.63	-1.65	0
32	36.0	0	-6.5	0.0	1.000	0.0	0.00	-809.35	0.00	0	-6.54	-1.92	0
27	41.0	0	-7.4	0.0	1.000	0.0	0.00	-997.13	0.00	0	-7.45	-2.18	0
22	46.0	0	-8.3	0.0	1.000	0.0	0.00	-1,218.35	0.00	0	-8.35	-2.45	0
17	51.0	0	-9.3	0.0	1.000	0.0	0.00	-1,482.83	0.00	0	-9.26	-2.71	0
12	56.0	0	-10.2	0.0	1.000	0.0	0.00	-1,804.62	0.00	0	-10.17	-2.98	0
		211								0			0

Total Cooling kW Demand	2.7	kW
Total Cooling kWh Consumption	292	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

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Coil Cleaning Savings

NW Regional Library

Fan Energy Savings

Static Pressure Reduction: 0.1 in WC

Equipment	Existing Usage		Proposed Usage		Savings	
	kW	kWh	kW	kWh	kW	kWh
AHU-1	12.0	52,712	11.6	50,954	0.4	1,757
AHU-2	0.7	3,118	0.7	2,910	0.0	208
AHU-3	1.6	7,174	1.5	6,696	0.1	478
AHU-4	15.0	65,539	14.5	63,355	0.5	2,185
AHU-5	1.3	5,601	1.2	5,228	0.1	373
Total	30.6	134,144	29.5	129,143	1.1	5,001

Fan Energy Savings

Coil Heat Transfer Efficiency Gain 5%

Equipment	Existing Usage		Proposed Usage		Savings	
	kW	kWh	kW	kWh	kW	kWh
AHU-1	36.2	174,863	34.3	165,660	1.9	9,203
AHU-2	4.7	22,563	4.4	21,375	0.2	1,188
AHU-3	12.8	62,048	12.2	58,783	0.7	3,266
AHU-4	43.2	208,708	40.9	197,723	2.3	10,985
AHU-5	8.2	39,485	7.7	37,407	0.4	2,078
Total	105.0	507,667	99.5	480,948	5.5	26,719

* ASHRAE Study published in ASHRAE Jounal Vol. 48 in November 2006 documented thermal efficiency savings of 25% and overall building HVAC consumption reduction of 10%. This calculation is conservative in modeling a 5% gain in heat transfer ability and a 0.1 in reduction in static pressure loses across the coil.

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Northwest Regional Library
NW Regional Library
AHU-1

Total Hrs On	4378.8	Design CHW	155 GPM
Design Airflow	24,000 CFM	Actual DeltaT	7 F
Exkisting Static Pressure	3 in H2O	System EER	10
Existing Fan Efficiency	75%	Existing Coil Eff	90%
Existing Fan BHP	15.10 BHP	Proposed Coil Ef	95%
Proposed Fan Efficiency	75%		
Proposed Static Pressure	2.9 in H2O		
Proposed Fan BHP	14.60 BHP		
Existing Motor Efficiency	94%		
Proposed Motor Efficieny	94%		

				EXISTING			PROPOSED			
% Load	CFM	Hrs @ Load	Hr % of Total	Existing Fan BHP	Input kW	Existing Fan Energy (kWh)	Fan BHP	Input kW	Energy	Annual kWh Savings
100%	24,000	364.9	8.3%	15	12.04	4,393	14.60	11.64	4,246	146
95%	22,800	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
90%	21,600	729.8	16.7%	15	12.04	8,785	14.60	11.64	8,492	293
85%	20,400	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
80%	19,200	729.8	16.7%	15	12.04	8,785	14.60	11.64	8,492	293
75%	18,000	364.9	8.3%	15	12.04	4,393	14.60	11.64	4,246	146
70%	16,800	729.8	16.7%	15	12.04	8,785	14.60	11.64	8,492	293
65%	15,600	364.9	8.3%	15	12.04	4,393	14.60	11.64	4,246	146
60%	14,400	364.9	8.3%	15	12.04	4,393	14.60	11.64	4,246	146
55%	13,200	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
50%	12,000	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
45%	10,800	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
40%	9,600	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
35%	8,400	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
30%	7,200	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
25%	6,000	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
20%	4,800	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
15%	3,600	0.0	0.0%	15	12.04	0	14.60	11.64	0	0
10%	2,400	364.9	8.3%	15	12.04	4,393	14.60	11.64	4,246	146
5%	1,200	364.9	8.3%	15	12.04	4,393	14.60	11.64	4,246	146
0%	0	0.0	0.0%	0	0.00	0	14.60	11.64	0	0
		4378.8				52,712		0.40	50,954	1757.05

VFD Fan Savings = 1,757 kWh

Load Profile

Monday thru Friday		
Hr of Day	Load %	Hrs
0	0%	0
1	0%	0
2	0%	0
3	0%	0
4	0%	0
5	0%	0
6	0%	0
7	0%	0
8	5%	260.7
9	10%	260.7
10	60%	260.7
11	65%	260.7
12	70%	260.7
13	75%	260.7
14	80%	260.7
15	90%	260.7
16	100%	260.7
17	90%	260.7

Saturday			Sunday		
Hr of Day	Load %	Hrs	Hr of Day	Load %	Hrs
0	0%	0	0	0%	0
1	0%	0	1	0%	0
2	0%	0	2	0%	0
3	0%	0	3	0%	0
4	0%	0	4	0%	0
5	0%	0	5	0%	0
6	0%	0	6	0%	0
7	0%	0	7	0%	0
8	5%	52.1	8	5%	52.1
9	10%	52.1	9	10%	52.1
10	60%	52.1	10	60%	52.1
11	65%	52.1	11	65%	52.1
12	70%	52.1	12	70%	52.1
13	75%	52.1	13	75%	52.1
14	80%	52.1	14	80%	52.1
15	90%	52.1	15	90%	52.1
16	100%	52.1	16	100%	52.1
17	90%	52.1	17	90%	52.1

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Northwest Regional Library
NW Regional Library
AHU-2

Total Hrs On	4378.8		Design CHW	20	GPM
Design Airflow	2,700	CFM	Actual DeltaT	7	F
Design Static Pressure	1.5	in H2O	System EER	10	
Existing Fan Efficiency	75%		Existing Coil Eff	90%	
Existing Fan BHP	0.85	BHP	Proposed Coil E	95%	
Proposed Fan Efficiency	75%				
Proposed Static Pressure	1.4	in H2O			
Proposed Fan BHP	0.79	BHP			
Existing Motor Efficiency	89%				
Proposed Motor Efficieny	89%				

				EXISTING			PROPOSED			
% Load	CFM	Hrs @ Load	Hr % of Total	Existing Fan BHP	Input kW	Existing Fan Energy (kWh)	Fan BHP	Input kW	Energy	**Annual kWh Savings**
100%	2,700	364.9	8.3%	1	0.71	260	0.79	0.66	243	17
95%	2,565	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
90%	2,430	729.8	16.7%	1	0.71	520	0.79	0.66	485	35
85%	2,295	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
80%	2,160	729.8	16.7%	1	0.71	520	0.79	0.66	485	35
75%	2,025	364.9	8.3%	1	0.71	260	0.79	0.66	243	17
70%	1,890	729.8	16.7%	1	0.71	520	0.79	0.66	485	35
65%	1,755	364.9	8.3%	1	0.71	260	0.79	0.66	243	17
60%	1,620	364.9	8.3%	1	0.71	260	0.79	0.66	243	17
55%	1,485	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
50%	1,350	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
45%	1,215	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
40%	1,080	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
35%	945	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
30%	810	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
25%	675	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
20%	540	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
15%	405	0.0	0.0%	1	0.71	0	0.79	0.66	0	0
10%	270	364.9	8.3%	1	0.71	260	0.79	0.66	243	17
5%	135	364.9	8.3%	1	0.71	260	0.79	0.66	243	17
0%	0	0.0	0.0%	0	0.00	0	0.79	0.66	0	0
		4378.8				3,118		0.05	2,910	

VFD Fan Savings = 208 kWh

Load Profile

Monday thru Friday		
Hr of Day	**Load %**	**Hrs**
0	0%	0
1	0%	0
2	0%	0
3	0%	0
4	0%	0
5	0%	0
6	0%	0
7	0%	0
8	5%	260.7
9	10%	260.7
10	60%	260.7
11	65%	260.7
12	70%	260.7
13	75%	260.7
14	80%	260.7
15	90%	260.7
16	100%	260.7
17	90%	260.7

Saturday			Sunday		
Hr of Day	**Load %**	**Hrs**	**Hr of Day**	**Load %**	**Hrs**
0	0%	0	0	0%	0
1	0%	0	1	0%	0
2	0%	0	2	0%	0
3	0%	0	3	0%	0
4	0%	0	4	0%	0
5	0%	0	5	0%	0
6	0%	0	6	0%	0
7	0%	0	7	0%	0
8	5%	52.1	8	5%	52.1
9	10%	52.1	9	10%	52.1
10	60%	52.1	10	60%	52.1
11	65%	52.1	11	65%	52.1
12	70%	52.1	12	70%	52.1
13	75%	52.1	13	75%	52.1
14	80%	52.1	14	80%	52.1
15	90%	52.1	15	90%	52.1
16	100%	52.1	16	100%	52.1
17	90%	52.1	17	90%	52.1

Broward County

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NW Regional Library
AHU-3

Total Hrs On	4378.8		Design CHW	55	GPM
Design Airflow	6,400	CFM	Actual DeltaT	7	F
Design Static Pressure	1.5	in H2O	System EER	10	
Existing Fan Efficiency	75%		Existing Coil Eff	90%	
Existing Fan BHP	2.01	BHP	Proposed Coil E	95%	
Proposed Fan Efficiency	75%				
Proposed Static Pressure	1.4	in H2O			
Proposed Fan BHP	1.88	BHP			
Existing Motor Efficiency	92%				
Proposed Motor Efficieny	92%				

				EXISTING			PROPOSED			
% Load	CFM	Hrs @ Load	Hr % of Total	Existing Fan BHP	Input kW	Existing Fan Energy (kWh)	Fan BHP	Input kW	Energy	**Annual kWh Savings**
100%	6,400	364.9	8.3%	2	1.64	598	1.88	1.53	558	40
95%	6,080	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
90%	5,760	729.8	16.7%	2	1.64	1,196	1.88	1.53	1,116	80
85%	5,440	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
80%	5,120	729.8	16.7%	2	1.64	1,196	1.88	1.53	1,116	80
75%	4,800	364.9	8.3%	2	1.64	598	1.88	1.53	558	40
70%	4,480	729.8	16.7%	2	1.64	1,196	1.88	1.53	1,116	80
65%	4,160	364.9	8.3%	2	1.64	598	1.88	1.53	558	40
60%	3,840	364.9	8.3%	2	1.64	598	1.88	1.53	558	40
55%	3,520	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
50%	3,200	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
45%	2,880	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
40%	2,560	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
35%	2,240	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
30%	1,920	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
25%	1,600	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
20%	1,280	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
15%	960	0.0	0.0%	2	1.64	0	1.88	1.53	0	0
10%	640	364.9	8.3%	2	1.64	598	1.88	1.53	558	40
5%	320	364.9	8.3%	2	1.64	598	1.88	1.53	558	40
0%	0	0.0	0.0%	0	0.00	0	1.88	1.53	0	0
		4378.8				7,174		0.11	6,696	

VFD Fan Savings = 478 kWh

Load Profile

Monday thru Friday		
Hr of Day	**Load %**	**Hrs**
0	0%	0
1	0%	0
2	0%	0
3	0%	0
4	0%	0
5	0%	0
6	0%	0
7	0%	0
8	5%	260.7
9	10%	260.7
10	60%	260.7
11	65%	260.7
12	70%	260.7
13	75%	260.7
14	80%	260.7
15	90%	260.7
16	100%	260.7
17	90%	260.7

Saturday			Sunday		
Hr of Day	**Load %**	**Hrs**	**Hr of Day**	**Load %**	**Hrs**
0	0%	0	0	0%	0
1	0%	0	1	0%	0
2	0%	0	2	0%	0
3	0%	0	3	0%	0
4	0%	0	4	0%	0
5	0%	0	5	0%	0
6	0%	0	6	0%	0
7	0%	0	7	0%	0
8	5%	52.1	8	5%	52.1
9	10%	52.1	9	10%	52.1
10	60%	52.1	10	60%	52.1
11	65%	52.1	11	65%	52.1
12	70%	52.1	12	70%	52.1
13	75%	52.1	13	75%	52.1
14	80%	52.1	14	80%	52.1
15	90%	52.1	15	90%	52.1
16	100%	52.1	16	100%	52.1
17	90%	52.1	17	90%	52.1

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Northwest Regional Library
NW Regional Library
AHU-4

Total Hrs On	4378.8	Design CHW	185 GPM
Design Airflow	30,000 CFM	Actual DeltaT	7 F
Design Static Pressure	3 in H2O	System EER	10
Existing Fan Efficiency	75%	Existing Coil Eff	90%
Existing Fan BHP	18.88 BHP	Proposed Coil E	95%
Proposed Fan Efficiency	75%		
Proposed Static Pressure	2.9 in H2O		
Proposed Fan BHP	18.25 BHP		
Existing Motor Efficiency	94%		
Proposed Motor Efficieny	94%		

				EXISTING			PROPOSED			
% Load	CFM	Hrs @ Load	Hr % of Total	Existing Fan BHP	Input kW	Existing Fan Energy (kWh)	Fan BHP	Input kW	Energy	Annual kWh Savings
100%	30,000	364.9	8.3%	19	14.97	5,462	18.25	14.47	5,280	182
95%	28,500	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
90%	27,000	729.8	16.7%	19	14.97	10,923	18.25	14.47	10,559	364
85%	25,500	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
80%	24,000	729.8	16.7%	19	14.97	10,923	18.25	14.47	10,559	364
75%	22,500	364.9	8.3%	19	14.97	5,462	18.25	14.47	5,280	182
70%	21,000	729.8	16.7%	19	14.97	10,923	18.25	14.47	10,559	364
65%	19,500	364.9	8.3%	19	14.97	5,462	18.25	14.47	5,280	182
60%	18,000	364.9	8.3%	19	14.97	5,462	18.25	14.47	5,280	182
55%	16,500	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
50%	15,000	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
45%	13,500	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
40%	12,000	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
35%	10,500	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
30%	9,000	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
25%	7,500	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
20%	6,000	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
15%	4,500	0.0	0.0%	19	14.97	0	18.25	14.47	0	0
10%	3,000	364.9	8.3%	19	14.97	5,462	18.25	14.47	5,280	182
5%	1,500	364.9	8.3%	19	14.97	5,462	18.25	14.47	5,280	182
0%	0	0.0	0.0%	0	0.00	0	18.25	14.47	0	0
		4378.8				65,539		0.50	63,355	

VFD Fan Savings = 2,185 kWh

Load Profile

Monday thru Friday		
Hr of Day	Load %	Hrs
0	0%	0
1	0%	0
2	0%	0
3	0%	0
4	0%	0
5	0%	0
6	0%	0
7	0%	0
8	5%	260.7
9	10%	260.7
10	60%	260.7
11	65%	260.7
12	70%	260.7
13	75%	260.7
14	80%	260.7
15	90%	260.7
16	100%	260.7
17	90%	260.7

Saturday			Sunday		
Hr of Day	Load %	Hrs	Hr of Day	Load %	Hrs
0	0%	0	0	0%	0
1	0%	0	1	0%	0
2	0%	0	2	0%	0
3	0%	0	3	0%	0
4	0%	0	4	0%	0
5	0%	0	5	0%	0
6	0%	0	6	0%	0
7	0%	0	7	0%	0
8	5%	52.1	8	5%	52.1
9	10%	52.1	9	10%	52.1
10	60%	52.1	10	60%	52.1
11	65%	52.1	11	65%	52.1
12	70%	52.1	12	70%	52.1
13	75%	52.1	13	75%	52.1
14	80%	52.1	14	80%	52.1
15	90%	52.1	15	90%	52.1
16	100%	52.1	16	100%	52.1
17	90%	52.1	17	90%	52.1

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Northwest Regional Library
NW Regional Library
AHU-5

Total Hrs On	4378.8	Design CHW	35	GPM
Design Airflow	4,850 CFM	Actual DeltaT	7	F
Design Static Pressure	1.5 in H2O	System EER	10	
Existing Fan Efficiency	75%	Existing Coil Eff	90%	
Existing Fan BHP	1.53 BHP	Proposed Coil E	95%	
Proposed Fan Efficiency	75%			
Proposed Static Pressure	1.4 in H2O			
Proposed Fan BHP	1.42 BHP			
Existing Motor Efficiency	89%			
Proposed Motor Efficieny	89%			

				EXISTING			PROPOSED			
% Load	CFM	Hrs @ Load	Hr % of Total	Existing Fan BHP	Input kW	Existing Fan Energy (kWh)	Fan BHP	Input kW	Energy	**Annual kWh Savings**
100%	4,850	364.9	8.3%	2	1.28	467	1.42	1.19	436	31
95%	4,608	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
90%	4,365	729.8	16.7%	2	1.28	934	1.42	1.19	871	62
85%	4,123	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
80%	3,880	729.8	16.7%	2	1.28	934	1.42	1.19	871	62
75%	3,638	364.9	8.3%	2	1.28	467	1.42	1.19	436	31
70%	3,395	729.8	16.7%	2	1.28	934	1.42	1.19	871	62
65%	3,153	364.9	8.3%	2	1.28	467	1.42	1.19	436	31
60%	2,910	364.9	8.3%	2	1.28	467	1.42	1.19	436	31
55%	2,668	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
50%	2,425	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
45%	2,183	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
40%	1,940	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
35%	1,698	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
30%	1,455	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
25%	1,213	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
20%	970	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
15%	728	0.0	0.0%	2	1.28	0	1.42	1.19	0	0
10%	485	364.9	8.3%	2	1.28	467	1.42	1.19	436	31
5%	243	364.9	8.3%	2	1.28	467	1.42	1.19	436	31
0%	0	0.0	0.0%	0	0.00	0	1.42	1.19	0	0
		4378.8				5,601		0.09	5,228	

VFD Fan Savings = 373 kWh

Load Profile

Monday thru Friday		
Hr of Day	**Load %**	**Hrs**
0	0%	0
1	0%	0
2	0%	0
3	0%	0
4	0%	0
5	0%	0
6	0%	0
7	0%	0
8	5%	260.7
9	10%	260.7
10	60%	260.7
11	65%	260.7
12	70%	260.7
13	75%	260.7
14	80%	260.7
15	90%	260.7
16	100%	260.7
17	90%	260.7

Saturday			**Sunday**		
Hr of Day	**Load %**	**Hrs**	**Hr of Day**	**Load %**	**Hrs**
0	0%	0	0	0%	0
1	0%	0	1	0%	0
2	0%	0	2	0%	0
3	0%	0	3	0%	0
4	0%	0	4	0%	0
5	0%	0	5	0%	0
6	0%	0	6	0%	0
7	0%	0	7	0%	0
8	5%	52.1	8	5%	52.1
9	10%	52.1	9	10%	52.1
10	60%	52.1	10	60%	52.1
11	65%	52.1	11	65%	52.1
12	70%	52.1	12	70%	52.1
13	75%	52.1	13	75%	52.1
14	80%	52.1	14	80%	52.1
15	90%	52.1	15	90%	52.1
16	100%	52.1	16	100%	52.1
17	90%	52.1	17	90%	52.1

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

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NW Regional Library - Chiller Replacement

MONTHLY ENERGY CONSUMPTION

By Opterra Energy

------- Monthly Energy Consumption -------

Utility	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Alternative: 1	**Northwest Regional Library - Baseline**												
Electric													
On-Pk Cons. (kWh)	24,965	21,846	39,180	38,786	43,611	52,305	54,734	62,382	53,757	45,229	36,871	29,831	503,294
On-Pk Demand (kW)	147	150	176	184	190	234	240	245	239	215	191	172	245
Gas													
On-Pk Cons. (therms)	21	16	0	0	0	0	0	0	0	0	0	0	36
On-Pk Demand (therms/hr)	5	1	0	0	0	0	0	0	0	0	0	0	5

Energy Consumption			Environmental Impact Analysis	
Building	14,256	Btu/(ft2-year)	CO_2	632,812 lbm/year
Source	42,713	Btu/(ft2-year)	SO_2	1,796 gm/year
			NOX	1,015 gm/year
Floor Area	120,750	ft2		

Utility	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Alternative: 2	**High Efficiency New Chillers**												
Electric													
On-Pk Cons. (kWh)	22,048	18,890	33,076	33,712	38,193	45,302	48,013	54,906	47,071	39,318	31,753	26,056	438,338
On-Pk Demand (kW)	115	118	147	154	159	193	203	214	205	176	158	142	214
Gas													
On-Pk Cons. (therms)	21	16	0	0	0	0	0	0	0	0	0	0	36
On-Pk Demand (therms/hr)	5	1	0	0	0	0	0	0	0	0	0	0	5

Energy Consumption			Environmental Impact Analysis	
Building	12,420	Btu/(ft2-year)	CO_2	551,140 lbm/year
Source	37,204	Btu/(ft2-year)	SO_2	1,564 gm/year
			NOX	884 gm/year
Floor Area	120,750	ft2		

Utility	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Alternative: 3	**New High Eff Chillers and Pumps**												
Electric													
On-Pk Cons. (kWh)	21,699	18,575	32,693	33,274	37,691	44,801	47,485	54,386	46,597	38,871	31,317	25,671	433,061
On-Pk Demand (kW)	115	118	146	153	159	193	202	213	204	175	158	142	213
Gas													
On-Pk Cons. (therms)	21	16	0	0	0	0	0	0	0	0	0	0	36
On-Pk Demand (therms/hr)	5	1	0	0	0	0	0	0	0	0	0	0	5

Energy Consumption			Environmental Impact Analysis	
Building	12,271	Btu/(ft2-year)	CO_2	544,505 lbm/year
Source	36,757	Btu/(ft2-year)	SO_2	1,545 gm/year
			NOX	874 gm/year
Floor Area	120,750	ft2		

Project Name: Broward County
Dataset Name: Northwest Regional Library.tce

TRACE® 700 v6.3 calculated at 04:07 PM on 10/17/2017
Alternative - 3 Monthly Energy Consumption report Page 3 of 3

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Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Revised 10-07-02
Printed 1/16/2018

Broward County
NW Pompano Library
Optimize HVAC Schedules and Set Points - 1st Floor - AHU-1, AHU-1-O/A

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

"VFD" or "IV" for inlet vanes or "DD" for discharge dampers

Fan operation type: VAV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 10.1 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	70 MBtu/hr	Full load cooling:	27.2 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Annual Cooling Savings: 8,716 kWh
Annual Heating Savings: 730 kWh
(No Electric Demand Savings Claimed)

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 63,213 kWh
Baseline Heating Energy: 1,955 kWh (Electric Conversion)

Existing		Proposed		
Unoccupied setback ends:	6.75	Unoccupied setback ends:	8.5	Setup: end time must
Unoccupied setback begins:	19.5	Unoccupied setback begins:	19.5	
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No	
Occupied cooling space temperature:	72°	Occupied cooling space temperature:	72°	
Cooling setup temperature:	78°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	65°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

EFLHs: 2088.964 Hours

Utility Baseline: 219,300 kWh
AC Usage: 30% of Baseline

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	error cfm Existing	error cfm Proposed	error Fan Existing (kW)	error Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	error cfm Existing	error cfm Proposed	error Fan Existing (off)	error Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	93%	88%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	0.3	0.3	31.0	31.0	0.0	0.0	76%	71%			0.0	0.0	0.0	0.0	0	0
92.5°	176.4	175.1	83%	83%	83%	83%	0.2	0.2	25.9	25.9	5.6	6.9	60%	54%	60%	54%	0.0	0.0	18.5	16.8	0	21
87.5°	902.8	867.8	65%	65%	65%	65%	0.2	0.2	20.1	20.1	196.2	241.2	43%	37%	43%	37%	0.0	0.0	13.3	11.6	7	712
82.5°	1196.8	957.7	46%	46%	46%	46%	0.1	0.1	14.4	14.4	988.2	1227.3	26%	21%	30%	30%	0.0	0.0	8.0	6.4	28	3,568
77.5°	896.7	622.0	28%	28%	30%	30%	0.1	0.1	8.6	8.6	1116.3	1390.0	9%	4%	30%	30%	0.0	0.0	2.8	1.1	21	3,913
72.5°	406.2	257.2	9%	9%	30%	30%	0.1	0.1	2.9	2.9	603.8	762.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	11	428
67.5°	149.0	90.6	0%	0%	30%	30%	0.1	0.1	0.0	0.0	240.2	299.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	5	0
62.5°	75.7	44.6	0%	0%	30%	30%	0.1	0.1	0.0	0.0	124.3	155.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	2	0
57.5°	36.2	17.3	0%	0%	30%	30%	0.1	0.1	0.0	0.0	73.8	92.7	0%	0%	30%	30%	0.0	0.0	0.0	0.0	1	0
52.5°	15.2	5.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	36.8	46.2	0%	0%	30%	30%	0.0	0.0	0.0	0.0	1	0
47.5°	4.8	0.9	0%	0%	30%	30%	0.1	0.1	0.0	0.0	15.2	19.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
42.5°	1.4	-0.1	0%	0%	30%	30%	0.1	0.1	0.0	0.0	5.6	7.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	0.2	-0.1	0%	0%	30%	30%	0.1	0.1	0.0	0.0	0.8	1.1	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,865	3,033									3,407	4,239									77	8,639

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	error cfm Existing	error cfm Proposed	error Fan Existing (kW)	error Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	error cfm Existing	error cfm Retrofit	error Fan Existing (off)	error Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.1	0.1	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	73.2	72.1	0%	0%	30%	30%	0.1	0.1	0.0	0.0	5.8	6.9	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	238.1	213.8	0%	0%	30%	30%	0.1	0.1	0.0	0.0	102.9	127.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	2	0
72.5°	210.8	154.6	0%	0%	30%	30%	0.1	0.1	0.0	0.0	231.2	287.4	0%	0%	30%	30%	0.0	0.0	0.0	0.0	4	0
67.5°	108.0	76.5	0%	0%	30%	30%	0.1	0.1	0.0	0.0	127.0	158.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	2	0
62.5°	70.1	51.4	10%	10%	30%	30%	0.1	0.1	0.1	0.1	75.9	94.6	0%	0%	30%	30%	0.0	0.0	0.0	0.0	1	1
57.5°	44.0	27.9	30%	30%	30%	30%	0.1	0.1	0.2	0.2	65.0	81.1	13%	0%	30%	30%	0.0	0.0	0.1	0.0	1	9
52.5°	26.2	14.7	50%	50%	50%	50%	0.1	0.1	0.3	0.3	45.8	57.3	31%	16%	31%	30%	0.0	0.0	0.2	0.1	1	7
47.5°	11.4	4.4	70%	70%	70%	70%	0.2	0.2	0.5	0.5	27.6	34.6	49%	35%	49%	35%	0.0	0.0	0.3	0.2	1	5
42.5°	3.4	1.0	90%	90%	90%	90%	0.2	0.2	0.6	0.6	9.6	12.0	67%	53%	67%	53%	0.0	0.0	0.5	0.4	1	2
37.5°	0.6	-0.3	100%	100%	100%	100%	0.3	0.3	0.7	0.7	3.4	4.3	85%	71%	85%	71%	0.0	0.0	0.6	0.5	0	1
32.5°	0.3	-0.1	100%	100%	100%	100%	0.3	0.3	0.7	0.7	1.7	2.1	100%	89%	100%	89%	0.0	0.0	0.7	0.6	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
	790	620									696	866									15	25

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Energy Savings Performance Contract
Whole Building Energy Model

Stirling Road Library

MODEL CALIBRATION	Electric kWh	Nat. Gas Therms
Baseline	412,209	0
eQUEST Model	411,987	0
Error	-0.05%	#DIV/0!

BASELINE MODEL

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	29,104	26,557	32,022	32,497	33,871	37,430	40,527	41,992	38,945	36,550	32,382	30,108	411,987
MAX KW	85.8	84.9	86.7	89.8	87.6	95.5	96.2	99.8	98.8	94.4	91.7	86.4	99.8
DAY/HR	26/19	25/20	30/20	15/19	42964	28/17	43022	31/19	42935	42783	23/19	42997	42978

FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0

ECM - Lighting Upgrade

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	21,759	19,647	24,060	24,521	25,885	29,362	32,017	33,460	31,071	28,554	24,902	22,658	317,896
MAX KW	58.1	57.3	59	61.4	56.8	63.8	66.3	69.8	69.6	64.6	63.8	58.9	69.8
DAY/HR	26/19	25/20	30/20	22/20	42963	28/17	43022	31/19	42935	42780	23/19	42997	42978

FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	7,345	6,910	7,962	7,976	7,986	8,068	8,510	8,532	7,874	7,996	7,480	7,450	94,091	22.8%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	27.70	27.60	27.70	28.40	30.80	31.70	29.90	30.00	29.20	29.80	27.90	27.50	30.00	29.02	Avg Monthly kW Savings

ECM -

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	19,118	17,843	20,328	17,024	17,515	19,392	20,973	22,722	20,813	19,732	21,542	20,298	237,300
MAX KW	69.8	75.4	84	53.8	49.3	50.5	52.7	58.6	57.9	55.8	73.3	73.9	75.4
DAY/HR	26/13	43059	42779	15/19	29/14	42889	43022	42874	42935	42874	23/19	23/20	42777

FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	2,641	1,804	3,732	7,497	8,370	9,970	11,044	10,738	10,258	8,822	3,360	2,360	80,596	19.6%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	-11.70	-18.10	-5.00	7.60	8.50	13.30	13.60	11.20	11.70	8.80	-9.50	-15.00	-5.60	1.28	Avg Monthly kW Savings

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Stirling Road Library
eQUEST Modeled Savings - Rate Structure

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	29104	26557	32022	32497	33830	0	0	0	43	36550	32382	30108	
		BILLING ENERGY:	29104	26557	32022	32497	33830	0	0	0	43	36550	32382	30108	253094
		METERED DEMAND:	85.9	85	86.9	90.1	87.8	0	0	0	43.4	94.4	91.8	86.4	
		BILLING DEMAND:	85.9	85	86.9	90.1	87.8	0	0	0	43.4	94.4	91.8	86.4	
		ENERGY CHGS($):	1703	1554	1874	1901	1979	0	0	0	3	2139	1895	1762	14809
		DEMAND CHGS($):	885	875	895	928	904	0	0	0	447	972	945	890	7742
		TOTAL CHGS($):	2588	2429	2768	2830	2883	0	0	0	449	3111	2840	2652	22560
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	0	0	0	0	0	4824	4872	5395	4903	0	0	0	
		BILLING ENERGY:	0	0	0	0	0	4824	4872	5395	4903	0	0	0	19993
		METERED DEMAND:	0	0	0	0	0	95.7	94.1	98.3	96.8	0	0	0	
		BILLING DEMAND:	0	0	0	0	0	95.7	94.1	98.3	96.8	0	0	0	
		ENERGY CHGS($):	0	0	0	0	0	664	670	742	674	0	0	0	2750
		DEMAND CHGS($):	0	0	0	0	0	1101	1082	1130	1114	0	0	0	4427
		TOTAL CHGS($):	0	0	0	0	0	1765	1752	1873	1788	0	0	0	7177
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	0	0	0	0	42	32606	35655	36597	33999	0	0	0	
		BILLING ENERGY:	0	0	0	0	42	32606	35655	36597	33999	0	0	0	138899
		METERED DEMAND:	0	0	0	0	42	91.8	96.2	100.4	99.2	0	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	0	2	1648	1802	1849	1718	0	0	0	7019
		TOTAL ENERGY:	29104	26557	32022	32497	33871	37430	40526	41992	38945	36550	32382	30108	411987
		TOTAL CHARGES ($):	2588	2429	2768	2830	2886	3412	3554	3722	3955	3111	2840	2652	36746

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	21759	19647	24060	24521	25848	0	0	0	38	28554	24902	22658	
		BILLING ENERGY:	21759	19647	24060	24521	25848	0	0	0	38	28554	24902	22658	191987
		METERED DEMAND:	58.3	57.5	59.1	61.6	57	0	0	0	38.5	64.7	63.8	58.9	
		BILLING DEMAND:	58.3	57.5	59.1	61.6	57	0	0	0	38.5	64.7	63.8	58.9	
		ENERGY CHGS($):	1273	1150	1408	1435	1512	0	0	0	2	1671	1457	1326	11233
		DEMAND CHGS($):	601	592	609	634	587	0	0	0	397	667	657	607	5350
		TOTAL CHGS($):	1874	1742	2016	2069	2099	0	0	0	399	2337	2114	1933	16583
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	0	0	0	0	0	3265	3309	3730	3427	0	0	0	
		BILLING ENERGY:	0	0	0	0	0	3265	3309	3730	3427	0	0	0	13731
		METERED DEMAND:	0	0	0	0	0	63.9	62.9	67.6	67.2	0	0	0	
		BILLING DEMAND:	0	0	0	0	0	63.9	62.9	67.6	67.2	0	0	0	
		ENERGY CHGS($):	0	0	0	0	0	449	455	513	471	0	0	0	1889
		DEMAND CHGS($):	0	0	0	0	0	735	723	777	773	0	0	0	3008
		TOTAL CHGS($):	0	0	0	0	0	1184	1178	1290	1244	0	0	0	4897
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	0	0	0	0	38	26097	28708	29730	27606	0	0	0	
		BILLING ENERGY:	0	0	0	0	38	26097	28708	29730	27606	0	0	0	112179
		METERED DEMAND:	0	0	0	0	37.6	62.3	66.3	70.3	69.8	0	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	0	2	1319	1451	1502	1395	0	0	0	5668
		TOTAL ENERGY:	21759	19647	24060	24521	25885	29362	32017	33460	31071	28554	24902	22658	317896
		TOTAL CHARGES ($):	1874	1742	2016	2069	2101	2503	2629	2793	3038	2337	2114	1933	27148

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	19118	17843	20328	17024	17490	0	0	0	25	19732	21542	20298	
		BILLING ENERGY:	19118	17843	20328	17024	17490	0	0	0	25	19732	21542	20298	153401
		METERED DEMAND:	71.8	78	65.6	54.5	48.3	0	0	0	25.1	56.6	74	75.3	
		BILLING DEMAND:	71.8	78	65.6	54.5	48.3	0	0	0	25.1	56.6	74	75.3	
		ENERGY CHGS($):	1119	1044	1189	996	1023	0	0	0	1	1155	1260	1188	8975
		DEMAND CHGS($):	739	803	676	562	498	0	0	0	259	583	762	776	5658
		TOTAL CHGS($):	1858	1847	1866	1558	1521	0	0	0	260	1738	2023	1963	14634
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	0	0	0	0	0	2526	2509	2897	2620	0	0	0	
		BILLING ENERGY:	0	0	0	0	0	2526	2509	2897	2620	0	0	0	10551
		METERED DEMAND:	0	0	0	0	0	50.6	49.5	56.2	55.9	0	0	0	
		BILLING DEMAND:	0	0	0	0	0	50.6	49.5	56.2	55.9	0	0	0	
		ENERGY CHGS($):	0	0	0	0	0	347	345	399	360	0	0	0	1452
		DEMAND CHGS($):	0	0	0	0	0	581	569	646	642	0	0	0	2439
		TOTAL CHGS($):	0	0	0	0	0	929	914	1045	1003	0	0	0	3891
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF- USE												
		METERED ENERGY:	0	0	0	0	24	16866	18464	19825	18168	0	0	0	
		BILLING ENERGY:	0	0	0	0	24	16866	18464	19825	18168	0	0	0	73348
		METERED DEMAND:	0	0	0	0	24.2	51.3	52.8	59.1	58.5	0	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	0	1	852	933	1002	918	0	0	0	3706
		TOTAL ENERGY:	19118	17843	20328	17024	17515	19392	20973	22722	20813	19732	21542	20298	237300
		TOTAL CHARGES ($):	1858	1847	1866	1558	1522	1781	1847	2047	2181	1738	2023	1963	22231

Broward County
Weston Library
Optimize HVAC Schedules and Set Points - 1st Floor - AHU-1, AHU-2, AC-1, AC-3

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 41.1 hp
Motor load factor: 75%
Existing average motor eff: 86.6%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	160 MBtu/hr	Full load cooling:	133.2 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 50,209 kWh
Annual Heating Savings: 2,309 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Existing		Proposed	
Unoccupied setback ends:	5.5	Unoccupied setback ends:	8
Unoccupied setback begins:	22	Unoccupied setback begins:	20
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	73°
Cooling setup temperature:	78°	Cooling setup temperature:	80°
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off **On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	65°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off **On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

Baseline Cooling Energy: 358,821 kWh
Baseline Heating Energy: 6,298 kWh (Electric Conversion)

EFLHs: 2399.094 Hours

Utility Baseline: 1124700 kWh
AC Usage: 32% of Baseline

Bin Average	Occupied Cooling										Unoccupied Cooling										Savings	
	Cooling Hours		Load Profile		VFD cfm		VFD Fan		Cooling Energy		Cooling Hours		Load Profile		VFD cfm		VFD Fan		Cooling Energy		Fan	Cooling
(°F)	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing (kW)	Proposed (kW)	Existing (kW)	Proposed (kW)	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing (off)	Proposed (off)	Existing (kW)	Proposed (kW)	(kWh)	(kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	96%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	27.3	27.3	152.2	152.2	0.0	0.0	79%	74%			0.0	0.0	0.0	0.0	0	0
92.5°	179.5	177.0	83%	83%	83%	83%	16.1	15.1	126.8	126.8	2.5	5.0	62%	57%	62%	57%	0.0	0.0	94.8	86.6	40	121
87.5°	996.0	911.5	65%	65%	65%	65%	7.8	7.8	98.6	98.6	104.0	187.5	45%	40%	45%	40%	0.0	0.0	69.7	61.0	655	3,988
82.5°	1547.8	1149.5	46%	46%	46%	46%	3.1	3.1	70.5	70.5	637.3	1036.5	29%	23%	30%	30%	0.0	0.0	43.6	35.4	1,240	19,239
77.5°	1259.3	814.5	28%	28%	30%	30%	1.0	1.0	42.3	42.3	752.7	1197.5	12%	6%	30%	30%	0.0	0.0	17.5	9.7	460	20,645
72.5°	590.8	355.0	9%	9%	30%	30%	1.0	1.0	14.1	14.1	416.2	655.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	247	3,368
67.5°	219.1	126.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	170.7	264.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	97	0
62.5°	110.4	62.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	89.6	138.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	50	0
57.5°	55.3	26.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	54.8	83.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	30	0
52.5°	24.1	10.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	27.9	42.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	15	0
47.5°	8.3	2.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	11.8	17.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	6	0
42.5°	2.6	0.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	4.4	6.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	2	0
37.5°	0.3	0.0	0%	0%	30%		1.0	0.0	0.0	0.0	0.7	1.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	5,000	3,638									2,272	3,634									2,841	47,368

Bin Average	Occupied Heating										Unoccupied Heating										Savings	
	Heating Hours		Load Profile		VFD cfm		VFD Fan		Heating Energy		Heating Hours		Load Profile		VFD cfm		VFD Fan		Heating Energy		Fan	Heating
(°F)	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing (kW)	Proposed (kW)	Existing (therm/hr)	Proposed (therm/hr)	(hrs)	(hrs)	Existing	Retrofit	Existing	Retrofit	Existing (off)	Retrofit (off)	Existing (therm/hr)	Proposed (therm/hr)	(kWh)	(therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	75.6	73.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	3.4	5.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	2	0
77.5°	280.9	238.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	60.1	103.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	44	0
72.5°	291.1	198.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	150.9	244.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	96	0
67.5°	148.2	97.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	86.8	137.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	52	0
62.5°	94.8	64.5	10%	10%	30%	30%	1.0	1.0	0.2	0.2	51.3	81.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	31	5
57.5°	63.6	38.0	30%	30%	30%	30%	1.0	1.0	0.5	0.5	45.4	71.0	13%	0%	30%	30%	0.0	0.0	0.2	0.0	26	22
52.5°	38.8	21.0	50%	50%	50%	50%	3.8	3.8	0.8	0.8	33.2	51.0	31%	16%	31%	30%	0.0	0.0	0.5	0.3	68	17
47.5°	18.0	7.5	70%	70%	70%	70%	9.8	9.8	1.1	1.1	21.0	31.5	49%	35%	49%	35%	0.0	0.0	0.8	0.6	102	11
42.5°	5.6	2.0	90%	90%	90%	90%	20.1	20.1	1.4	1.4	7.4	11.0	67%	53%	67%	53%	0.0	0.0	1.1	0.8	73	4
37.5°	1.3	0.0	100%	100%	100%		27.3	0.0	1.6	1.6	2.8	4.0	85%	71%	85%	71%	0.0	0.0	1.4	1.1	34	1
32.5°	0.6	0.0	100%	100%	100%		27.3	0.0	1.6	1.6	1.4	2.0	100%	89%	100%	89%	0.0	0.0	1.6	1.4	17	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
	1,022	744									464	742									547	60

OPTERRA
An ENGIE company

Broward County
Weston Library
Optimize HVAC Schedules and Set Points - 2nd Floor - AHU-3, AC-2

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN(Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 26.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	232 MBtu/hr	Full load cooling:	71.9 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 10,414 kWh
Annual Heating Savings: 1,401 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 156,853 kWh
Baseline Heating Energy: 8,065 kWh (Electric Conversion)
EFLHs: 2493.2 Hours
Utility Baseline: 1124700 kWh
AC Usage: 18% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	6	Unoccupied setback ends:	6	
Unoccupied setback begins:	22	Unoccupied setback begins:	22	
Weekends unoccupied?:	No Yes / No	Weekends unoccupied?:	No Yes / No	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	73°	
Cooling setup temperature:	78°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	65°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (off)	VFD Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	96%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	16.8	16.8	82.2	82.2	0.0	0.0	79%	74%			0.0	0.0	0.0	0.0	0	0
92.5°	179.5	179.5	83%	83%	83%	83%	9.9	9.9	68.5	68.5	2.5	2.5	62%	57%	62%	57%	0.0	0.0	51.2	46.8	0	11
87.5°	986.3	981.8	65%	65%	65%	65%	4.8	4.8	53.3	53.3	100.8	107.3	45%	40%	45%	40%	0.0	0.0	37.4	32.9	31	578
82.5°	1587.3	1508.3	46%	46%	46%	46%	1.9	1.9	38.1	38.1	597.8	676.8	29%	23%	30%	30%	0.0	0.0	23.5	19.1	151	4,144
77.5°	1310.6	1208.0	28%	28%	30%	30%	0.6	0.6	22.8	22.8	701.4	804.0	12%	6%	30%	30%	0.0	0.0	9.7	5.3	66	4,909
72.5°	623.4	564.3	9%	9%	30%	30%	0.6	0.6	7.6	7.6	366.6	445.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	38	450
67.5°	231.9	206.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	159.1	183.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	16	0
62.5°	117.3	103.5	0%	0%	30%	30%	0.6	0.6	0.0	0.0	82.8	96.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	9	0
57.5°	69.8	50.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	50.3	59.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	6	0
52.5°	26.4	21.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	25.6	30.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	3	0
47.5°	9.3	7.3	0%	0%	30%	30%	0.6	0.6	0.0	0.0	10.8	12.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	1	0
42.5°	3.0	2.3	0%	0%	30%	30%	0.6	0.6	0.0	0.0	4.0	4.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	0.4	0.3	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.6	0.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	5,151	4,848									2,121	2,424									322	10,093

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (off)	VFD Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	75.6	75.5	0%	0%	30%	30%	0.6	0.6	0.0	0.0	3.4	3.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	283.8	278.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	57.3	63.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	4	0
72.5°	300.8	281.5	0%	0%	30%	30%	0.6	0.6	0.0	0.0	141.3	160.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	12	0
67.5°	154.4	142.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	80.6	93.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	8	0
62.5°	98.3	91.3	10%	10%	30%	30%	0.6	0.6	0.2	0.2	47.8	54.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	4	2
57.5°	66.9	60.3	30%	30%	30%	30%	0.6	0.6	0.7	0.7	42.1	48.8	13%	0%	30%	30%	0.0	0.0	0.3	0.0	4	17
52.5°	41.4	36.3	50%	50%	50%	50%	2.4	2.4	1.2	1.2	30.6	35.8	31%	16%	31%	30%	0.0	0.0	0.7	0.4	12	14
47.5°	19.8	16.3	70%	70%	70%	70%	6.0	6.0	1.6	1.6	19.3	22.8	49%	35%	49%	35%	0.0	0.0	1.1	0.8	21	9
42.5°	6.3	5.0	90%	90%	90%	90%	12.4	12.4	2.1	2.1	6.8	8.0	67%	53%	67%	53%	0.0	0.0	1.6	1.2	15	3
37.5°	1.5	1.0	100%	100%	100%	100%	16.8	16.8	2.3	2.3	2.5	3.0	85%	71%	85%	71%	0.0	0.0	2.0	1.6	8	1
32.5°	0.8	0.5	100%	100%	100%	100%	16.8	16.8	2.3	2.3	1.3	1.5	100%	89%	100%	89%	0.0	0.0	2.3	2.1	4	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
	1,053	992									433	495									94	47

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
West Regional Library
BAS System Check-Out

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 40% — Not applicable to "CV"

*Assuming Similar Schedule to that of West Regional Library

Total fan motor hp: 70.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating: 556 MBtu/hr
Heating efficiency: 100%
Heating full load at: 40°
Heating zero load at: 65°
Delta: 25°

Full load cooling: 197.3 tons
Avg. Cooling efficiency: 1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Cooling full load at: 92°
Cooling zero load at: 70°
Delta: 22°

Annual Cooling Savings: 29,232 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change)

Baseline Cooling Energy: 559,301 kWh
Baseline Heating Energy: 12,659 kWh (Electric Conversion)

EFLHs: 2837.212 Hours

Utility Baseline: 1400440 kWh
AC Usage: 41% of Baseline

Existing
Unoccupied setback ends: 8
Unoccupied setback begins: 19
Weekends unoccupied?: No — Yes / No

Occupied cooling space temperature: 73°
Cooling setup temperature: 80°
Fan mode during unoccupied cooling: Off

Occupied heating space temperature: 70°
Heating setback temperature: 60°
Fan mode during unoccupied heating: Off

Occupied Percent Outside Air: 10%
Unoccupied Percent Outside Air: 0%

Proposed
Unoccupied setback ends: 8
Unoccupied setback begins: 19
Weekends unoccupied?: No — Yes / No

Occupied cooling space temperature: 74°
Cooling setup temperature: 80°
Fan mode during unoccupied cooling: Off — **On, Off, Cycle**

Occupied heating space temperature: 70°
Heating setback temperature: 60°
Fan mode during unoccupied heating: Off — **On, Off, Cycle**

Occupied Percent Outside Air: 10%
Unoccupied Percent Outside Air: 0%

Occupied Cooling

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
97.5°	4.0	4.0	100%	100%	100%	100%	45.4	45.4	225.4	225.4
92.5°	175.8	175.8	100%	99%	100%	99%	45.4	43.6	225.4	222.4
87.5°	877.9	877.9	80%	76%	80%	76%	23.4	20.4	179.3	171.1
82.5°	1047.6	1047.6	57%	53%	57%	53%	9.0	7.5	128.1	119.9
77.5°	720.4	720.4	34%	30%	40%	40%	3.5	3.5	76.9	68.7
72.5°	308.5	308.5	11%	0%	40%	40%	3.5	3.5	25.6	17.4
67.5°	110.0	110.0	0%	0%	40%	40%	3.5	3.5	0.0	0.0
62.5°	55.0	55.0	0%	0%	40%	40%	3.5	3.5	0.0	0.0
57.5°	23.4	23.4	0%	0%	40%	40%	3.5	3.5	0.0	0.0
52.5°	8.8	8.8	0%	0%	40%	40%	3.5	3.5	0.0	0.0
47.5°	2.1	2.1	0%	0%	40%	40%	3.5	3.5	0.0	0.0
42.5°	0.4	0.4	0%	0%	40%	40%	3.5	3.5	0.0	0.0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
	3,336	3,336								

Unoccupied Cooling / Savings

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (off)	VFD Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings Fan (kWh)	Savings Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	90%	90%			0.0	0.0	0.0	0.0	0	0
92.5°	6.3	6.3	70%	70%	70%	70%	0.0	0.0	157.4	157.4	313	540
87.5°	221.1	221.1	49%	49%	49%	40%	0.0	0.0	110.9	110.9	2,578	7,196
82.5°	1137.4	1137.4	29%	29%	40%	40%	0.0	0.0	64.3	64.3	1,575	8,588
77.5°	1291.6	1291.6	8%	8%	40%	40%	0.0	0.0	17.7	17.7	0	5,905
72.5°	700.5	700.5	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	2,537
67.5°	279.3	279.3	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
62.5°	145.0	145.0	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
57.5°	86.6	86.6	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
52.5°	43.3	43.3	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
47.5°	17.9	17.9	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
42.5°	6.6	6.6	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
37.5°	1.0	1.0	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,937	3,937									4,466	24,767

Occupied Heating

Bin Average (°F)	Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
87.5°	4.0	4.0	0%	0%	40%	40%	3.5	3.5	0.0	0.0
82.5°	72.6	72.6	0%	0%	40%	40%	3.5	3.5	0.0	0.0
77.5°	223.8	223.8	0%	0%	40%	40%	3.5	3.5	0.0	0.0
72.5°	175.5	175.5	0%	0%	40%	40%	3.5	3.5	0.0	0.0
67.5°	87.6	87.6	0%	0%	40%	40%	3.5	3.5	0.0	0.0
62.5°	58.1	58.1	10%	10%	40%	40%	3.5	3.5	0.6	0.6
57.5°	33.5	33.5	30%	30%	40%	40%	3.5	3.5	1.7	1.7
52.5°	18.5	18.5	50%	50%	50%	50%	6.3	6.3	2.8	2.8
47.5°	6.6	6.6	70%	70%	70%	70%	16.2	16.2	3.9	3.9
42.5°	1.8	1.8	90%	90%	90%	90%	33.4	33.4	5.0	5.0
37.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
32.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
27.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
22.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
17.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
12.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
7.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
2.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
-2.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
-7.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
-12.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6
	682	682								

Unoccupied Heating / Savings

Bin Average (°F)	Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (off)	VFD Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings Fan (kWh)	Savings Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	6.4	6.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
77.5°	117.3	117.3	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
72.5°	266.5	266.5	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
67.5°	147.4	147.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
62.5°	87.9	87.9	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
57.5°	75.5	75.5	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
52.5°	53.5	53.5	16%	16%	40%	40%	0.0	0.0	0.9	0.9	0	0
47.5°	32.4	32.4	35%	35%	40%	40%	0.0	0.0	1.9	1.9	0	0
42.5°	11.3	11.3	53%	53%	53%	53%	0.0	0.0	2.9	2.9	0	0
37.5°	4.0	4.0	71%	71%	71%	71%	0.0	0.0	3.9	3.9	0	0
32.5°	2.0	2.0	89%	89%	89%	89%	0.0	0.0	5.0	5.0	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
	804	804									0	0

Broward County
Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Broward County
West Regional Library
Optimize HVAC Schedules and Set Points

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:
Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 40% — Not applicable to "CV"

*Assuming Similar Schedule to that of West Regional Library

Total fan motor hp: 70.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):
Full load heating: 556 MBtu/hr — Full load cooling: 197.3 tons
Heating efficiency: 100% — Avg. Cooling efficiency: 1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at: 40° — Cooling full load at: 92°
Heating zero load at: 65° — Cooling zero load at: 70°
Delta: 25° — Delta: 22°

Annual Cooling Savings: 61,294 kWh
Annual Heating Savings: 4,007 kWh
(No Electric Demand Savings Claimed)

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bin

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 620,595 kWh
Baseline Heating Energy: 17,545 kWh (Electric Conversion)
EFLHs: 2830.786 Hours
Utility Baseline: 1400440 kWh
AC Usage: 45% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	8	Unoccupied setback ends:	8	
Unoccupied setback begins:	20.5	Unoccupied setback begins:	19	
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	73°	
Cooling setup temperature:	78°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	65°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (off)	VFD Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Savings: Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	100%	100%	100%	45.4	45.4	225.4	225.4	0.0	0.0	97%	90%			0.0	0.0	0.0	0.0	0	0
92.5°	177.6	175.8	100%	100%	100%	100%	45.4	45.4	225.4	225.4	4.4	6.3	76%	70%	76%	70%	0.0	0.0	172.3	157.4	86	193
87.5°	928.3	877.9	80%	80%	80%	80%	23.4	23.4	179.3	179.3	170.7	221.1	56%	49%	56%	40%	0.0	0.0	125.8	110.9	1,178	5,007
82.5°	1198.9	1047.6	57%	57%	57%	57%	9.0	9.0	128.1	128.1	986.1	1137.4	35%	29%	40%	40%	0.0	0.0	79.2	64.3	1,364	24,352
77.5°	861.6	720.4	34%	34%	40%	40%	3.5	3.5	76.9	76.9	1150.4	1291.8	14%	8%	40%	40%	0.0	0.0	32.6	17.7	496	25,498
72.5°	377.0	309.5	11%	11%	40%	40%	3.5	3.5	25.6	25.6	632.1	700.5	0%	0%	40%	40%	0.0	0.0	0.0	0.0	240	1,748
67.5°	133.6	110.0	0%	0%	40%	40%	3.5	3.5	0.0	0.0	256.4	279.3	0%	0%	40%	40%	0.0	0.0	0.0	0.0	[illegible]	0
62.5°	65.5	55.0	0%	0%	40%	40%	3.5	3.5	0.0	0.0	134.5	145.0	0%	0%	40%	40%	0.0	0.0	0.0	0.0	37	0
57.5°	28.1	23.4	0%	0%	40%	40%	3.5	3.5	0.0	0.0	81.9	86.6	0%	0%	40%	40%	0.0	0.0	0.0	0.0	16	0
52.5°	10.6	8.8	0%	0%	40%	40%	3.5	3.5	0.0	0.0	41.4	43.3	0%	0%	40%	40%	0.0	0.0	0.0	0.0	7	0
47.5°	2.7	2.1	0%	0%	40%	40%	3.5	3.5	0.0	0.0	17.3	17.9	0%	0%	40%	40%	0.0	0.0	0.0	0.0	2	0
42.5°	0.6	0.4	0%	0%	40%	40%	3.5	3.5	0.0	0.0	6.4	6.6	0%	0%	40%	40%	0.0	0.0	0.0	0.0	1	0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	1.0	1.0	0%	0%	40%	40%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,789	3,336									3,483	3,937									3,506	57,788

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (off)	VFD Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Savings: Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	40%	40%	3.5	3.5	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	73.9	72.6	0%	0%	40%	40%	3.5	3.5	0.0	0.0	5.1	6.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	5	0
77.5°	245.1	223.8	0%	0%	40%	40%	3.5	3.5	0.0	0.0	95.9	117.3	0%	0%	40%	40%	0.0	0.0	0.0	0.0	75	0
72.5°	209.3	175.5	0%	0%	40%	40%	3.5	3.5	0.0	0.0	232.8	266.5	0%	0%	40%	40%	0.0	0.0	0.0	0.0	119	0
67.5°	102.4	87.6	0%	0%	40%	40%	3.5	3.5	0.0	0.0	132.6	147.4	0%	0%	40%	40%	0.0	0.0	0.0	0.0	52	0
62.5°	67.7	58.1	10%	10%	40%	40%	3.5	3.5	0.6	0.6	78.3	87.9	0%	0%	40%	40%	0.0	0.0	0.0	0.0	34	5
57.5°	40.3	33.5	30%	30%	40%	40%	3.5	3.5	1.7	1.7	68.8	75.5	13%	0%	40%	40%	0.0	0.0	0.7	0.0	24	60
52.5°	22.3	18.5	50%	50%	50%	50%	6.3	6.3	2.8	2.8	49.8	53.5	31%	16%	40%	40%	0.0	0.0	1.7	0.9	24	47
47.5°	7.9	6.6	70%	70%	70%	70%	16.2	16.2	3.9	3.9	31.1	32.4	49%	35%	49%	40%	0.0	0.0	2.7	1.9	21	28
42.5°	2.1	1.8	90%	90%	90%	90%	33.4	33.4	5.0	5.0	10.9	11.3	67%	53%	67%	53%	0.0	0.0	3.7	2.9	13	10
37.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	4.0	4.0	85%	71%	85%	71%	0.0	0.0	4.8	3.9	0	3
32.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	2.0	2.0	100%	89%	100%	89%	0.0	0.0	5.6	5.0	0	1
27.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0.0	0.0	100%	100%			0.0	0.0	5.6	5.6	0	0
	775	682									711	804									365	154

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Weston Library
BAS System Checkout - 1st Floor - AHU-1, AHU-2, AC-1, AC-3

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 41.1 hp
Motor load factor: 75%
Existing average motor eff: 86.8%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	160 MBtu/hr	Full load cooling:	133.2 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 17,109 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 308,812 kWh
Baseline Heating Energy: 3,989 kWh (Electric Conversion)

EFLHs: 2054.013 Hours

Utility Baseline: 1124700 kWh
AC Usage: 28% of Baseline

Existing		*Proposed*		
Unoccupied setback ends:	8	Unoccupied setback ends:	8	
Unoccupied setback begins:	20	Unoccupied setback begins:	20	
Weekends unoccupied?	No Yes / No	Weekends unoccupied?	No Yes / No	
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	74°	
Cooling setup temperature:	80°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	60°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off	**On, Off, Cycle**
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (off)	VFD Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	91%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	99%	100%	99%	27.3	26.4	162.2	160.5	0.0	0.0	74%	74%			0.0	0.0	0.0	0.0	4	7
92.5°	177.0	177.0	83%	80%	83%	80%	16.1	14.5	126.8	122.3	5.0	5.0	57%	57%	57%	57%	0.0	0.0	86.6	86.6	282	798
87.5°	911.5	911.5	65%	62%	65%	62%	7.8	6.9	98.6	94.1	187.5	187.5	40%	40%	40%	40%	0.0	0.0	61.0	61.0	881	4,110
82.5°	1148.5	1148.5	46%	43%	46%	43%	3.1	2.6	70.5	65.9	1036.5	1036.5	23%	23%	30%	30%	0.0	0.0	35.4	35.4	574	5,179
77.5°	814.5	814.5	28%	25%	30%	30%	1.0	1.0	42.3	37.8	1197.5	1197.5	6%	6%	30%	30%	0.0	0.0	9.7	9.7	0	3,673
72.5°	355.0	355.0	9%	6%	30%	30%	1.0	1.0	14.1	9.6	655.0	655.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	1,601
67.5°	126.0	126.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	264.0	264.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	62.0	62.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	138.0	138.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	26.5	26.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	83.5	83.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	10.0	10.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	42.0	42.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
47.5°	2.5	2.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	17.5	17.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
42.5°	0.5	0.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	6.5	6.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	1.0	1.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	3,638	3,638									3,634	3,634									1,741	15,368

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (off)	VFD Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	73.5	73.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	5.5	5.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	238.0	238.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	103.0	103.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
72.5°	198.0	198.0	0%	0%	30%	30%	1.0	1.0	0.0	0.0	244.0	244.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
67.5°	97.5	97.5	0%	0%	30%	30%	1.0	1.0	0.0	0.0	137.5	137.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	64.5	64.5	10%	10%	30%	30%	1.0	1.0	0.2	0.2	81.5	81.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	38.0	38.0	30%	30%	30%	30%	1.0	1.0	0.5	0.5	71.0	71.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	21.0	21.0	50%	50%	50%	50%	3.8	3.8	0.8	0.8	51.0	51.0	16%	16%	30%	30%	0.0	0.0	0.3	0.3	0	0
47.5°	7.5	7.5	70%	70%	70%	70%	9.8	9.8	1.1	1.1	31.5	31.5	35%	35%	35%	35%	0.0	0.0	0.6	0.6	0	0
42.5°	2.0	2.0	90%	90%	90%	90%	20.1	20.1	1.4	1.4	11.0	11.0	53%	53%	53%	53%	0.0	0.0	0.8	0.8	0	0
37.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	4.0	4.0	71%	71%	71%	71%	0.0	0.0	1.1	1.1	0	0
32.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	2.0	2.0	89%	89%	89%	89%	0.0	0.0	1.4	1.4	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0.0	0.0	100%	100%			0.0	0.0	1.6	1.6	0	0
	744	744									742	742									0	0

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Weston Library
BAS System Checkout - 2nd Floor - AHU-3, AC-2

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:
Fan operation type: VFD — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 30% — Not applicable to "CV"

Total fan motor hp: 26.0 hp
Motor load factor: 75%
Existing average motor eff: 89.0%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	232 MBtu/hr	Full load cooling:	71.9 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	97°
Heating zero load at:	65°	Cooling zero load at:	70°
Delta:	25°	Delta:	27°

Annual Cooling Savings: 12,081 kWh
Annual Heating Savings: 0 kWh
(No Electric Demand Savings Claimed)

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 186,439 kWh
Baseline Heating Energy: 6,584 kWh (Electric Conversion)
EFLHs: 2348.482 Hours
Utility Baseline: 1124700 kWh
AC Usage: 17% of Baseline

Existing		*Proposed*	
Unoccupied setback ends:	6	Unoccupied setback ends:	6
Unoccupied setback begins:	22	Unoccupied setback begins:	22
Weekends unoccupied?	No (Yes / No)	Weekends unoccupied?	No (Yes / No)
Occupied cooling space temperature:	73°	Occupied cooling space temperature:	74°
Cooling setup temperature:	80°	Cooling setup temperature:	80°
Fan mode during unoccupied cooling:	Off	Fan mode during unoccupied cooling:	Off (**On, Off, Cycle**)
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	60°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	Off	Fan mode during unoccupied heating:	Off (**On, Off, Cycle**)
Occupied Percent Outside Air:	10%	Occupied Percent Outside Air:	10%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (off)	VFD Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	91%	91%			0.0	0.0	0.0	0.0	0	0
97.5°	4.0	4.0	100%	99%	100%	99%	16.8	16.3	82.2	81.3	0.0	0.0	74%	74%			0.0	0.0	0.0	0.0	2	4
92.5°	179.5	179.5	83%	80%	83%	80%	9.9	8.9	68.5	66.1	2.5	2.5	57%	57%	57%	57%	0.0	0.0	46.8	46.8	176	437
87.5°	991.8	991.8	65%	62%	65%	62%	4.8	4.2	53.3	50.8	107.3	107.3	40%	40%	40%	40%	0.0	0.0	32.9	32.9	592	2,415
82.5°	1508.3	1508.3	46%	43%	46%	43%	1.9	1.6	38.1	35.6	676.8	676.8	23%	23%	30%	30%	0.0	0.0	19.1	19.1	466	3,673
77.5°	1208.0	1208.0	28%	25%	30%	30%	0.6	0.6	22.8	20.4	804.0	804.0	6%	6%	30%	30%	0.0	0.0	5.3	5.3	0	2,942
72.5°	564.3	564.3	9%	6%	30%	30%	0.6	0.6	7.6	5.2	446.8	446.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	1,374
67.5°	206.8	206.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	103.3	103.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	103.5	103.5	0%	0%	30%	30%	0.6	0.6	0.0	0.0	96.5	96.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	50.8	50.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	59.3	59.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	21.8	21.8	0%	0%	30%	30%	0.6	0.6	0.0	0.0	30.3	30.3	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
47.5°	7.3	7.3	0%	0%	30%	30%	0.6	0.6	0.0	0.0	12.8	12.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
42.5°	2.3	2.3	0%	0%	30%	30%	0.6	0.6	0.0	0.0	4.8	4.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
37.5°	0.3	0.3	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.8	0.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	4,848	4,848									2,424	2,424									1,236	10,845

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	VFD cfm Existing	VFD cfm Proposed	VFD Fan Existing (kW)	VFD Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	VFD cfm Existing	VFD cfm Retrofit	VFD Fan Existing (off)	VFD Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	75.5	75.5	0%	0%	30%	30%	0.6	0.6	0.0	0.0	3.5	3.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
77.5°	278.0	278.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	63.0	63.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
72.5°	281.5	281.5	0%	0%	30%	30%	0.6	0.6	0.0	0.0	160.5	160.5	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
67.5°	142.0	142.0	0%	0%	30%	30%	0.6	0.6	0.0	0.0	93.0	93.0	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
62.5°	91.3	91.3	10%	10%	30%	30%	0.6	0.6	0.2	0.2	54.8	54.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
57.5°	60.3	60.3	30%	30%	30%	30%	0.6	0.6	0.7	0.7	48.8	48.8	0%	0%	30%	30%	0.0	0.0	0.0	0.0	0	0
52.5°	36.3	36.3	50%	50%	50%	50%	2.4	2.4	1.2	1.2	35.8	35.8	16%	16%	30%	30%	0.0	0.0	0.4	0.4	0	0
47.5°	16.3	16.3	70%	70%	70%	70%	6.0	6.0	1.6	1.6	22.8	22.8	35%	35%	35%	35%	0.0	0.0	0.8	0.8	0	0
42.5°	5.0	5.0	90%	90%	90%	90%	12.4	12.4	2.1	2.1	8.0	8.0	53%	53%	53%	53%	0.0	0.0	1.2	1.2	0	0
37.5°	1.0	1.0	100%	100%	100%	100%	16.8	16.8	2.3	2.3	3.0	3.0	71%	71%	71%	71%	0.0	0.0	1.6	1.6	0	0
32.5°	0.5	0.5	100%	100%	100%	100%	16.8	16.8	2.3	2.3	1.5	1.5	89%	89%	89%	89%	0.0	0.0	2.1	2.1	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0.0	0.0	100%	100%			0.0	0.0	2.3	2.3	0	0
	992	992									495	495									0	0

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split System - Savings Summary

Facility	Weston Library
Unit Location	Bldg C

Existing Conditions

Mfg	Rheem
Model #	13AJA18A01
Date Mfg	2009

Baseline Data

Peak kW	
kWh	1,124,700

Proposed Conditions

Mfg	
Model #	

Energy Usage

Existing Conditions

00-08 Hrs	1.6	kW	1,341	kWh	0	Therms
09-16 Hrs	1.6	kW	1,880	kWh	0	Therms
17-00 Hrs	1.6	kW	1,606	kWh	0	Therms
Total	**1.6**	**kW**	**4,827**	**kWh**	**0**	**Therms**
	#DIV/0!		*0.4%*			

Proposed Conditions

00-08 Hrs	1.6	kW	1,288	kWh	0	Therms
09-16 Hrs	1.6	kW	1,807	kWh	0	Therms
17-00 Hrs	1.6	kW	1,543	kWh	0	Therms
Total	**1.6**	**kW**	**4,638**	**kWh**	**0**	**Therms**
	#DIV/0!		*0.4%*			

Unadjusted Annual Savings		
	0.0	kW
	189	kWh
	0	Therms

Adjusted for BAS	
0.0	**kW**
189	**kWh**

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	Weston Library
Unit Location	Bldg C
Mfg	Rheem
Model #	13AJA18A01

**RED TEXT IS INPUT

Estimated SF Served by Unit	150	SF	
Max Cooling Load	4.5	kbtu/hr	400SF/Ton
Max Heating Load	1.9	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	72	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	180.0	btu/h-degF	
Tbal - Cooling	35.0	deg-F	
Ktot - Heating	-62.5	btu/h-degF	
Tbal - Heating	-38.7	deg-F	
DX Cooling System	1.5	tons	
	18	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	8	Age of Unit (yrs)	
	1.63	Full Load kW (degraded 0.5% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	8	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	0.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2009		

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	67.0	0	12.1	16.9	1.000	16.9	1.63	0.72	0
97	62.0	0	11.2	17.6	1.000	17.6	1.63	0.64	0
92	57.0	0	10.3	18.3	1.000	18.3	1.63	0.56	0
87	52.0	54	9.4	19.0	1.000	19.0	1.63	0.49	43
82	47.0	643	8.5	19.7	1.000	19.7	1.63	0.43	451
77	42.0	869	7.6	20.4	1.000	20.4	1.63	0.37	525
72	37.0	624	6.7	21.1	1.000	21.1	1.63	0.32	321
		2,190							1,341

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	-98.7	165	6.2	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
57	-93.7	123	5.9	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
52	-88.7	80	5.5	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
47	-83.7	43	5.2	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
42	-78.7	15	4.9	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
37	-73.7	5	4.6	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
32	-68.7	2	4.3	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
27	-63.7	0	4.0	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
22	-58.7	0	3.7	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
17	-53.7	0	3.4	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
12	-48.7	0	3.0	0.0	1.000	0.0	0.00	1.00	0	0.00	0.00	0
		433							0			0

Total Cooling kW Demand	1.6	kW
Total Cooling kWh Consumption	1,341	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

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Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	Weston Library
Unit Location	Bldg C
Mfg	Rheem
Model #	13AJA18A01

**RED TEXT IS INPUT

Estimated SF Served by Unit	160	SF	
Max Cooling Load	4.5	kbtu/hr	400SF/Ton
Max Heating Load	6.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	72	deg-F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	100.0	btu/h-degF	
Tbal - Cooling	35.0	deg F	
Ktot - Heating	-200.0	btu/h-degF	
Tbal - Heating	36.7	deg F	
DX Cooling System	1.5	tons	
	18	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	1.63	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	8	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	67.0	0	12.1	16.9	1.000	16.9	1.63	0.72	0.00	0
97	62.0	5	11.2	17.6	1.000	17.6	1.63	0.64	0.06	5
92	57.0	174	10.3	18.3	1.000	18.3	1.63	0.56	1.79	159
87	52.0	787	9.4	19.0	1.000	19.0	1.63	0.49	7.37	633
82	47.0	816	8.5	19.7	1.000	19.7	1.63	0.43	6.91	572
77	42.0	609	7.6	20.4	1.000	20.4	1.63	0.37	4.61	368
72	37.0	278	6.7	21.1	1.000	21.1	1.63	0.32	1.85	143
		2,669							22.58	1,880

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	-25.3	70	5.1	0.0	1.000	0.0	0.00	1.00	0.01	0	0.00	0.00	0
57	-20.3	34	4.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
52	-15.3	17	3.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
47	-10.3	5	2.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
42	-5.3	2	1.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
37	-0.3	1	0.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
32	4.7	0	-0.9	0.0	1.000	0.0	0.00	-115.65	0.00	0	-0.94	-0.28	0
27	9.7	0	-1.9	0.0	1.000	0.0	0.00	-259.16	0.00	0	-1.94	-0.57	0
22	14.7	0	-2.9	0.0	1.000	0.0	0.00	-428.22	0.00	0	-2.94	-0.86	0
17	19.7	0	-3.9	0.0	1.000	0.0	0.00	-630.34	0.00	0	-3.94	-1.15	0
12	24.7	0	-4.9	0.0	1.000	0.0	0.00	-876.26	0.00	0	-4.94	-1.45	0
		129								0			0

Total Cooling kW Demand	1.6	kW
Total Cooling kWh Consumption	1,880	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	Weston Library
Unit Location	Bldg C
Mfg	Rheem
Model #	13AJA18A01

**RED TEXT IS INPUT

Estimated SF Served by Unit	150	SF	
Max Cooling Load	4.5	kbtu/hr	400SF/Ton
Max Heating Load	6.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	72	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	100.0	btu/h-degF	
Tbal - Cooling	35.0	deg-F	
Ktot - Heating	-200.0	btu/h-degF	
Tbal - Heating	36.7	deg-F	
DX Cooling System	1.5	tons	
	18	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	8	Age of Unit (yrs)	
	1.63	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	8	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	67.0	0	12.1	16.9	1.000	16.9	1.63	0.72	0.00	0
97	62.0	1	11.2	17.6	1.000	17.6	1.63	0.64	0.01	1
92	57.0	11	10.3	18.3	1.000	18.3	1.63	0.56	0.11	10
87	52.0	275	9.4	19.0	1.000	19.0	1.63	0.49	2.58	221
82	47.0	821	8.5	19.7	1.000	19.7	1.63	0.43	6.95	575
77	42.0	862	7.6	20.4	1.000	20.4	1.63	0.37	6.52	521
72	37.0	539	6.7	21.1	1.000	21.1	1.63	0.32	3.59	278
		2,509							19.77	1,606

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	-25.3	106	5.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
57	-20.3	60	4.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
52	-15.3	31	3.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
47	-10.3	10	2.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
42	-5.3	3	1.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
37	-0.3	1	0.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
32	4.7	0	-0.9	0.0	1.000	0.0	0.00	-115.65	0.00	0	-0.94	-0.28	0
27	9.7	0	-1.9	0.0	1.000	0.0	0.00	-259.18	0.00	0	-1.94	-0.57	0
22	14.7	0	-2.9	0.0	1.000	0.0	0.00	-428.22	0.00	0	-2.94	-0.86	0
17	19.7	0	-3.9	0.0	1.000	0.0	0.00	-630.34	0.00	0	-3.94	-1.15	0
12	24.7	0	-4.9	0.0	1.000	0.0	0.00	-876.26	0.00	0	-4.94	-1.45	0
		211								0			0

Total Cooling kW Demand	1.6	kW
Total Cooling kWh Consumption	1,606	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility Weston Library
Unit Location Bldg C
Mfg
Model #

**RED TEXT IS INPUT

Estimated SF Served by Unit	150	SF	
Max Cooling Load	4.5	kbtu/hr	400SF/Ton
Max Heating Load	1.9	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	5.7	kbtu/hr	
Inside Cooling Design Temp	72	deg F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	180.0	btu/h.degF	
Tbal - Cooling	35.0	deg-F	
Ktot - Heating	62.5	btu/h.degF	
Tbal - Heating	-35.7	deg-F	
DX Cooling System	1.5	tons	
	18	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	1.57	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	11.5	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	67.0	0	12.1	16.9	1.000	16.9	1.57	0.72	0.00	0
97	62.0	0	11.2	17.6	1.000	17.6	1.57	0.64	0.00	0
92	57.0	0	10.3	18.3	1.000	18.3	1.57	0.56	0.00	0
87	52.0	54	9.4	19.0	1.000	19.0	1.57	0.49	0.51	42
82	47.0	643	8.5	19.7	1.000	19.7	1.57	0.43	5.44	433
77	42.0	869	7.6	20.4	1.000	20.4	1.57	0.37	6.58	605
72	37.0	624	6.7	21.1	1.000	21.1	1.57	0.32	4.16	309
		2,190							16.69	1,288

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	-98.7	165	6.2	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
57	-93.7	123	5.9	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
52	-88.7	80	5.5	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
47	-83.7	43	5.2	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
42	-78.7	15	4.9	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
37	-73.7	5	4.6	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
32	-68.7	2	4.3	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
27	-63.7	0	4.0	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
22	-58.7	0	3.7	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
17	-53.7	0	3.4	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
12	-48.7	0	3.0	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
		433								0			0

Total Cooling kW Demand	1.6	kW
Total Cooling kWh Consumption	1,288	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	Weston Library
Unit Location	Bldg C
Mfg	
Model #	

*RED TEXT IS INPUT

Estimated SF Served by Unit	160	SF	
Max Cooling Load	4.5	kbtu/hr	400SF/Ton
Max Heating Load	6.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	72	deg-F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	180.0	btu/h-degF	
Tbal - Cooling	35.0	deg F	
Ktot - Heating	-200.0	btu/h-degF	
Tbal - Heating	36.7	deg F	
DX Cooling System	1.5	tons	
	18	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	1.57	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	67.0	0	12.1	16.9	1.000	16.9	1.57	0.72	0.00	0
97	62.0	5	11.2	17.6	1.000	17.6	1.57	0.64	0.06	5
92	57.0	174	10.3	18.3	1.000	18.3	1.57	0.56	1.79	153
87	52.0	787	9.4	19.0	1.000	19.0	1.57	0.49	7.37	608
82	47.0	816	8.5	19.7	1.000	19.7	1.57	0.43	6.91	549
77	42.0	609	7.6	20.4	1.000	20.4	1.57	0.37	4.61	354
72	37.0	278	6.7	21.1	1.000	21.1	1.57	0.32	1.85	138
		2,669							22.58	1,807

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	-25.3	70	5.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
57	-20.3	34	4.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
52	-15.3	17	3.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
47	-10.3	5	2.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
42	-5.3	2	1.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
37	-0.3	1	0.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
32	4.7	0	-0.9	0.0	1.000	0.0	0.00	-115.65	0.00	0	-0.94	-0.28	0
27	9.7	0	-1.9	0.0	1.000	0.0	0.00	-259.18	0.00	0	-1.94	-0.57	0
22	14.7	0	-2.9	0.0	1.000	0.0	0.00	-428.22	0.00	0	-2.94	-0.86	0
17	19.7	0	-3.9	0.0	1.000	0.0	0.00	-630.34	0.00	0	-3.94	-1.15	0
12	24.7	0	-4.9	0.0	1.000	0.0	0.00	-876.26	0.00	0	-4.94	-1.45	0
		129								0			0

Total Cooling kW Demand	1.6	kW
Total Cooling kWh Consumption	1,807	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	Weston Library
Unit Location	Bldg C
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	160	SF	
Max Cooling Load	4.6	kbtu/hr	400SF/Ton
Max Heating Load	6.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	50		
Average internal heat gain	6.7	kbtu/hr	
Inside Cooling Design Temp	72	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	100.0	btu/h-degF	
Tbal - Cooling	35.0	deg-F	
Ktot - Heating	-200.0	btu/h-degF	
Tbal - Heating	36.7	deg-F	
DX Cooling System	1.5	tons	
	18	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	1.57	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	67.0	0	12.1	16.9	1.000	16.9	1.57	0.72	0.00	0
97	62.0	1	11.2	17.6	1.000	17.6	1.57	0.64	0.01	1
92	57.0	11	10.3	18.3	1.000	18.3	1.57	0.56	0.11	10
87	52.0	275	9.4	19.0	1.000	19.0	1.57	0.49	2.58	212
82	47.0	821	8.5	19.7	1.000	19.7	1.57	0.43	6.95	553
77	42.0	862	7.6	20.4	1.000	20.4	1.57	0.37	6.52	501
72	37.0	539	6.7	21.1	1.000	21.1	1.57	0.32	3.59	267
		2,509							19.77	1,543

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	-25.3	106	5.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
57	-20.3	60	4.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
52	-15.3	31	3.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
47	-10.3	10	2.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
42	-5.3	3	1.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
37	-0.3	1	0.1	0.0	1.000	0.0	0.00	1.00	0.00	0	0.00	0.00	0
32	4.7	0	-0.9	0.0	1.000	0.0	0.00	-115.65	0.00	0	-0.94	-0.28	0
27	9.7	0	-1.9	0.0	1.000	0.0	0.00	-259.18	0.00	0	-1.94	-0.57	0
22	14.7	0	-2.9	0.0	1.000	0.0	0.00	-428.22	0.00	0	-2.94	-0.86	0
17	19.7	0	-3.9	0.0	1.000	0.0	0.00	-630.34	0.00	0	-3.94	-1.15	0
12	24.7	0	-4.9	0.0	1.000	0.0	0.00	-876.28	0.00	0	-4.94	-1.45	0
		211								0			0

Total Cooling kW Demand	1.6	kW
Total Cooling kWh Consumption	1,543	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Public Safety Building
Whole Building Energy Simulation

BASELINE

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	465173	424615	472304	0	0	0	0	0	0	609	484572	477967	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	2325273
		METERED DEMAND:	976.4	905	941.3	0	0	0	0	0	0	609	968.1	932.4	
		BILLING DEMAND:	976.4	905	941.3	0	0	0	0	0	0	988.9	968.1	932.4	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	9344	8660	8996	0	0	0	0	0	0	13	9265	8923	45201
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	575	473049	498155	548114	569432	575473	553556	521441	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	3739763
		METERED DEMAND:	0	0	581.6	933.7	969.4	1033.8	1031.7	1025.8	1128.3	988.9	0	0	
		BILLING DEMAND:	0	0	941.3	933.7	969.4	1033.8	1031.7	1025.8	1128.3	988.9	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	12	8936	9277	9894	9873	9817	10798	9451	0	0	68057
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	101992	102069	124312	0	0	0	0	0	0	0	118632	116763	
		BILLING ENERGY:	101992	102069	124312	0	0	0	0	0	0	0	118632	116763	563768
		METERED DEMAND:	876.3	886.3	900.4	0	0	0	0	0	0	0	951.8	914.4	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	4963	4967	6049	0	0	0	0	0	0	0	5773	5682	27433
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	363182	322546	347992	0	0	0	0	0	0	609	365940	361204	
		BILLING ENERGY:	363182	322546	347992	0	0	0	0	0	0	609	365940	361204	1761473
		METERED DEMAND:	976.4	905	941.3	0	0	0	0	0	0	609	968.1	932.4	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	15541	13802	14891	0	0	0	0	0	0	26	15659	15456	75373
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	158018	147692	176827	172760	183339	174752	153678	0	0	
		BILLING ENERGY:	0	0	0	158018	147692	176827	172760	183339	174752	153678	0	0	1167067
		METERED DEMAND:	0	0	0	933.7	969.4	1033.8	1031.7	1025.8	1128.3	988.9	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	7689	7187	8604	8407	8921	8503	7478	0	0	56789
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	575	315031	350462	371287	396671	392134	378805	367763	0	0	
		BILLING ENERGY:	0	0	575	315031	350462	371287	396671	392134	378805	367763	0	0	2572727
		METERED DEMAND:	0	0	581.6	910.6	916.4	985.6	998.6	987.3	998.9	961.3	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	25	13480	14996	15887	16974	16779	16209	15737	0	0	110087
□Pub	li	c Safety Building								DOE-2.2-	48y 12	/11/2017	9:05	1:30 BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL CI	LC-1D					WEATHE	R FILE-	W. Palm	BeachFL	TMY2
													----(CON	TINUED)-	
		TOTAL ENERGY:	465173	424615	472879	473049	498155	548114	569432	575473	553556	522050	484572	477967	6065035
		TOTAL CHARGES ($):	29847	27429	29973	30105	31460	34385	35254	35517	35511	32704	30696	30061	382942

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Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Lighting Reduction

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	444765	405061	444330	0	0	0	0	0	0	608	460164	455000	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	2209974
		METERED DEMAND:	962.6	815	830.7	0	0	0	0	0	0	609.2	857.8	830.3	
		BILLING DEMAND:	962.6	815	830.7	0	0	0	0	0	0	874.3	857.8	830.3	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	9212	7799	7940	0	0	0	0	0	0	11	8209	7946	41118
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	586	444399	471397	518246	540236	544424	524826	494634	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	3538702
		METERED DEMAND:	0	0	590.7	822.9	857.9	916.5	915.5	908.7	1022.9	874.3	0	0	
		BILLING DEMAND:	0	0	830.7	822.9	857.9	916.5	915.5	908.7	1022.9	874.3	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	11	7875	8210	8771	8762	8696	9789	8356	0	0	60470
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	96076	95721	114896	0	0	0	0	0	0	0	109848	109203	
		BILLING ENERGY:	96076	95721	114896	0	0	0	0	0	0	0	109848	109203	525743
		METERED DEMAND:	802.4	815	805.4	0	0	0	0	0	0	0	857.8	820.5	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	4675	4658	5591	0	0	0	0	0	0	0	5345	5314	25583
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	348689	309340	329434	0	0	0	0	0	0	608	350316	345797	
		BILLING ENERGY:	348689	309340	329434	0	0	0	0	0	0	608	350316	345797	1684185
		METERED DEMAND:	962.6	807.3	830.7	0	0	0	0	0	0	609.2	857.2	830.3	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	14920	13237	14096	0	0	0	0	0	0	26	14990	14797	72066
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	138123	129551	157068	153692	163129	155630	135782	0	0	
		BILLING ENERGY:	0	0	0	138123	129551	157068	153692	163129	155630	135782	0	0	1032975
		METERED DEMAND:	0	0	0	822.9	857.9	916.5	915.5	908.7	1022.9	874.3	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	6721	6304	7643	7479	7938	7573	6607	0	0	50265
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	586	306276	341846	361178	386544	381295	369195	358851	0	0	
		BILLING ENERGY:	0	0	586	306276	341846	361178	386544	381295	369195	358851	0	0	2505771
		METERED DEMAND:	0	0	590.7	807	817.3	886	891.9	880.4	890	853.7	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	25	13106	14628	15455	16540	16316	15798	15355	0	0	107222
DPub	II	c Safety Building								DOE-2.2-	48y 12	/11/2017	9:05	7:33 BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL Cl	LC-1D					WEATHE	R FILE-	W Palm ----(CON	BeachFL TINUED)-	TMY2
		TOTAL ENERGY:	444765	405061	444915	444398	471397	518246	540236	544424	524826	495242	460164	455000	5748675
		TOTAL CHARGES ($):	28807	25694	27663	27702	29142	31869	32780	32950	33160	30355	28544	28057	356723
		Billed kW Savings:	13.8	90	110.6	110.8	111.5	117.3	116.2	117.1	105.4	114.6	110.3	102.1	1219.7
		On-Peak kWh Savings	5,916	6,348	9,416	19,895	18,141	19,759	19,068	20,210	19,122	17,896	8,784	7,560	172,115
		Off-Peak kWh Savings	14,493	13,206	18,547	8,755	8,616	10,109	10,127	10,839	9,610	8,913	15,624	15,407	144,246
		Total kWh Savings	20,409	19,554	27,963	28,650	26,757	29,868	29,195	31,049	28,732	26,809	24,408	22,967	316,361

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM C-11 Schedules & Stpts

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
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Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	345063	315358	346076	0	0	0	0	0	0	95	357714	351676	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1716031
		METERED DEMAND:	1009.4	917	832.8	0	0	0	0	0	0	95.9	860.3	829.3	
		BILLING DEMAND:	1009.4	917	832.8	0	0	0	0	0	0	878.2	860.3	829.3	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	9660	8775	7960	0	0	0	0	0	0	11	8233	7936	42576
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	97	346069	364625	399049	415506	421730	405773	381330	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	2734128
		METERED DEMAND:	0	0	97.6	825.9	861.7	922.4	920.8	913.7	1028.2	878.2	0	0	
		BILLING DEMAND:	0	0	832.8	825.9	861.7	922.4	920.8	913.7	1028.2	878.2	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	11	7904	8246	8827	8812	8745	9840	8393	0	0	60778
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	94313	94148	111862	0	0	0	0	0	0	0	107529	106864	
		BILLING ENERGY:	94313	94148	111862	0	0	0	0	0	0	0	107529	106864	514715
		METERED DEMAND:	834.8	834.7	802.1	0	0	0	0	0	0	0	853.9	819.2	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	4589	4581	5443	0	0	0	0	0	0	0	5232	5200	25046
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	250750	221210	234214	0	0	0	0	0	0	95	250184	244813	
		BILLING ENERGY:	250750	221210	234214	0	0	0	0	0	0	95	250184	244813	1201266
		METERED DEMAND:	1009.4	917	832.8	0	0	0	0	0	0	95.9	860.3	829.3	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	10730	9466	10022	0	0	0	0	0	0	4	10705	10476	51402
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	138236	129739	157374	154089	163642	155966	136060	0	0	
		BILLING ENERGY:	0	0	0	138236	129739	157374	154089	163642	155966	136060	0	0	1035106
		METERED DEMAND:	0	0	0	825.9	861.7	922.4	920.8	913.7	1028.2	878.2	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	6727	6313	7658	7498	7963	7589	6621	0	0	50368
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	97	207832	234886	241675	261417	258088	249806	245270	0	0	
		BILLING ENERGY:	0	0	97	207832	234886	241675	261417	258088	249806	245270	0	0	1699072
		METERED DEMAND:	0	0	97.6	809.7	815.2	886.8	898.2	897.5	897.1	860.4	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	4	8893	10051	10341	11186	11044	10689	10495	0	0	72703
DPub	II	c Safety Building								DOE-2 2-	48y 12	/11/2017	0.419444	9:37 BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL CI	LC-1D					WEATHE	R FILE-	W Palm	BeachFL	TMY2
----	--	----------------	------	------	------	------	------	------	------	------	------	------	----(CON	TINUED)-	------
			#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######
		TOTAL ENERGY:	345063	315358	346173	346069	364625	399049	415506	421730	405773	381425	357713	351676	4450159
		TOTAL CHARGES ($):	24979	22822	23440	23523	24610	26827	27496	27751	28119	25524	24171	23612	302874
		Billed kW Savings	-48.8	102	-2.1	3	3.8	-5.9	5.3	5	-5.3	-3.9	-2.5	1	-184.6
		On-Peak kWh Savings	1,763	1,573	3,034	-113	-188	-306	-397	-513	-336	-278	2,319	2,339	8,897
		Off-Peak kWh Savings	97,939	88,130	95,709	98,444	106,960	119,503	125,127	123,207	119,389	114,094	100,132	100,984	1,289,618
		Total kWh Savings	99,702	89,703	98,743	98,331	106,772	119,197	124,730	122,694	119,053	113,816	102,451	103,323	1,298,515

OPTERRA
An ENGIE company

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM C-1 New BAS

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	277129	256977	303623	0	0	0	0	0	0	258	306495	291334	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1435862
		METERED DEMAND:	1148.8	1069.2	799.2	0	0	0	0	0	0	258.4	908.8	964.6	
		BILLING DEMAND:	1148.8	1069.2	799.2	0	0	0	0	0	0	842	908.8	964.6	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	10994	10232	7638	0	0	0	0	0	0	11	8697	9231	46803
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	266	306135	314850	360873	374345	386912	366260	331924	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	2441519
		METERED DEMAND:	0	0	266.7	793.3	831.9	893	892.5	887.2	997	842	0	0	
		BILLING DEMAND:	0	0	799.2	793.3	831.9	893	892.5	887.2	997	842	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	10	7592	7961	8546	8541	8490	9542	8047	0	0	58729
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	68029	69222	90665	0	0	0	0	0	0	0	88117	80770	
		BILLING ENERGY:	68029	69222	90665	0	0	0	0	0	0	0	88117	80770	396804
		METERED DEMAND:	729.5	756.4	760.5	0	0	0	0	0	0	0	816.3	762	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	3310	3368	4412	0	0	0	0	0	0	0	4288	3930	19308
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	209101	187755	212957	0	0	0	0	0	0	258	218378	210563	
		BILLING ENERGY:	209101	187755	212957	0	0	0	0	0	0	258	218378	210563	1039012
		METERED DEMAND:	1148.8	1069.2	799.2	0	0	0	0	0	0	258.4	908.8	964.6	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	8947	8034	9112	0	0	0	0	0	0	11	9344	9010	44459
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	127072	120464	149805	146930	156594	148476	126643	0	0	
		BILLING ENERGY:	0	0	0	127072	120464	149805	146930	156594	148476	126643	0	0	975984
		METERED DEMAND:	0	0	0	793.3	831.9	893	892.5	887.2	997	842	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	6183	5862	7290	7150	7620	7225	6162	0	0	47491
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	266	179063	194386	211068	227416	230319	217784	205280	0	0	
		BILLING ENERGY:	0	0	266	179063	194386	211068	227416	230319	217784	205280	0	0	1465582
		METERED DEMAND:	0	0	266.7	773.5	779.1	854.1	862.6	852.8	861.9	824.4	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	11	7662	8318	9032	9731	9855	9319	8784	0	0	62712
DPub	li	c Safety Building							DOE-2 2-	48y 12	/11/2017	0.459028 6:03	BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL Cl	LC-1D					WEATHE	R FILE-	W Palm	BeachFL	TMY2
													----(CON	TINUED)-	
		TOTAL ENERGY:	277129	256977	303889	306135	314850	360873	374346	386913	366260	332181	306495	291334	3877382
		TOTAL CHARGES ($):	23252	21635	21184	21437	22141	24867	25422	25965	26085	23015	22329	22171	279503
		Billed kW Savings	186.2	254.2	31.5	29.6	26	23.5	23	21.5	25.9	32.3	51	134.3	412.4
		On-Peak kWh Savings	28,047	26,499	24,231	11,051	9,087	7,263	6,762	6,535	7,154	9,139	21,731	28,433	185,932
		Off-Peak kWh Savings	139,588	121,585	116,797	127,213	147,460	150,110	159,128	150,976	151,411	153,921	131,938	135,234	1,685,361
		Total kWh Savings	167,635	148,084	141,028	138,264	156,547	157,373	165,890	157,511	158,565	163,060	153,669	163,667	1,871,293

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM C-4 VFD Pumping

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	271238	251772	297265	0	0	0	0	0	0	251	300244	284945	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1405765
		METERED DEMAND:	1141.4	1061.8	787.5	0	0	0	0	0	0	252.2	901	956.9	
		BILLING DEMAND:	1141.4	1061.8	787.5	0	0	0	0	0	0	830.5	901	956.9	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	10923	10161	7526	0	0	0	0	0	0	11	8623	9157	46402
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	261	300100	308556	354442	368318	380826	360182	325958	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	2398595
		METERED DEMAND:	0	0	261.3	781.6	820.4	881.5	881	875.7	981.7	830.5	0	0	
		BILLING DEMAND:	0	0	787.5	781.6	820.4	881.5	881	875.7	981.7	830.5	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	10	7480	7851	8436	8432	8381	9395	7937	0	0	57920
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	66956	68038	89179	0	0	0	0	0	0	0	86567	79320	
		BILLING ENERGY:	66956	68038	89179	0	0	0	0	0	0	0	86567	79320	390059
		METERED DEMAND:	716.6	744.3	752.3	0	0	0	0	0	0	0	804.8	750.5	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	3258	3311	4339	0	0	0	0	0	0	0	4212	3860	18980
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	204283	183735	208086	0	0	0	0	0	0	251	213678	205625	
		BILLING ENERGY:	204283	183735	208086	0	0	0	0	0	0	251	213678	205625	1015657
		METERED DEMAND:	1141.4	1061.8	787.5	0	0	0	0	0	0	252.2	901	956.9	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	8741	7862	8904	0	0	0	0	0	0	11	9143	8799	43460
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	125029	118317	147216	144702	154269	146223	124548	0	0	
		BILLING ENERGY:	0	0	0	125029	118317	147216	144702	154269	146223	124548	0	0	960304
		METERED DEMAND:	0	0	0	781.6	820.4	881.5	881	875.7	981.7	830.5	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	6084	5757	7164	7041	7507	7115	6060	0	0	46728
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	261	175071	190240	207226	223616	226557	213958	201410	0	0	
		BILLING ENERGY:	0	0	261	175071	190240	207226	223616	226557	213958	201410	0	0	1438339
		METERED DEMAND:	0	0	261.3	762	767.6	842.8	851.2	841.5	850.4	812.9	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	11	7491	8140	8867	9569	9694	9155	8618	0	0	61547
DPub	li	c Safety Building								DOE-2 2-	48y 12	/11/2017	0.460417	9:15 BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL Cl	LC-1D					WEATHE	R FILE-	W Palm	BeachFL	TMY2
													----(CON	TINUED)-	
		TOTAL ENERGY:	271238	251772	297526	300100	308556	354442	368318	380826	360182	326210	300244	284945	3804360
		TOTAL CHARGES ($):	22923	21334	20791	21055	21748	24466	25041	25582	25665	22637	21979	21816	275037
		Billed kW Savings	7.4	7.4	11.7	11.7	11.5	11.5	11.5	11.5	15.3	11.5	7.8	7.7	126.5
		On-Peak kWh Savings	1,073	1,184	1,486	2,043	2,147	2,589	2,228	2,325	2,253	2,095	1,550	1,450	22,423
		Off-Peak kWh Savings	4,818	4,020	4,876	3,992	4,146	3,842	3,800	3,762	3,826	3,877	4,700	4,938	50,597
		Total kWh Savings	5,891	5,204	6,362	6,035	6,293	6,431	6,028	6,087	6,079	5,972	6,250	6,388	73,020

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM M-1 New Chiller

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	245600	228144	267031	0	0	0	0	0	0	213	270949	257450	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1269428
		METERED DEMAND:	1113.3	1033.6	733.5	0	0	0	0	0	0	213.4	869.7	925.1	
		BILLING DEMAND:	1113.3	1033.6	733.5	0	0	0	0	0	0	771.6	869.7	925.1	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	10654	9891	7011	0	0	0	0	0	0	10	8323	8853	44741
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	220	268553	275286	318798	329578	342083	323413	291568	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	2149459
		METERED DEMAND:	0	0	220.8	728.7	761.4	813.8	813.3	809.8	924.7	771.6	0	0	
		BILLING DEMAND:	0	0	733.5	728.7	761.4	813.8	813.3	809.8	924.7	771.6	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	9	6974	7287	7788	7784	7750	8849	7374	0	0	53815
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	61044	62204	80564	0	0	0	0	0	0	0	78421	72049	
		BILLING ENERGY:	61044	62204	80564	0	0	0	0	0	0	0	78421	72049	354282
		METERED DEMAND:	673.2	696.2	704	0	0	0	0	0	0	0	747.7	701.4	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	2970	3027	3920	0	0	0	0	0	0	0	3816	3506	17239
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	184556	165940	186467	0	0	0	0	0	0	213	192528	185401	
		BILLING ENERGY:	184556	165940	186467	0	0	0	0	0	0	213	192528	185401	915105
		METERED DEMAND:	1113.3	1033.6	733.5	0	0	0	0	0	0	213.4	869.7	925.1	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	7897	7101	7979	0	0	0	0	0	0	9	8238	7933	39157
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	114356	108727	136241	133793	142861	135470	114804	0	0	
		BILLING ENERGY:	0	0	0	114356	108727	136241	133793	142861	135470	114804	0	0	886252
		METERED DEMAND:	0	0	0	728.7	761.4	813.8	813.3	809.8	924.7	771.6	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	5565	5291	6629	6510	6952	6592	5586	0	0	43125
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	220	154197	166559	182557	195784	199222	187943	176764	0	0	
		BILLING ENERGY:	0	0	220	154197	166559	182557	195784	199222	187943	176764	0	0	1263246
		METERED DEMAND:	0	0	220.8	717.4	715.5	779.6	787.7	778.4	786.2	754	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	9	6598	7127	7812	8378	8525	8042	7564	0	0	54054
DPub	li	c Safety Building								DOE-2.2-	48y 12	/11/2017	0.461806	1 11 BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL Cl	LC-1D					WEATHE	R FILE-	W Palm	BeachFL	TMY2
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			#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######
		TOTAL ENERGY:	245600	228144	267251	268553	275286	318798	329578	342083	323413	291781	270949	257450	3418886
		TOTAL CHARGES ($):	21521	20019	18929	19136	19704	22229	22672	23227	23483	20543	20377	20292	252132
		Billed kW Savings	28.1	28.2	54	52.9	59	67.7	67.7	65.9	57	58.9	31.3	31.8	602.5
		On-Peak kWh Savings	5,912	5,834	8,615	10,673	9,590	10,975	10,909	11,406	10,753	9,744	8,146	7,271	109,830
		Off-Peak kWh Savings	19,727	17,795	21,660	20,874	23,681	24,669	27,832	27,335	26,015	24,684	21,150	20,224	275,646
		Total kWh Savings	25,639	23,629	30,275	31,547	33,271	35,644	38,741	38,743	36,768	34,428	29,296	27,495	385,476

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM M-3 CHW Pump Replacement

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	244757	227349	265900	0	0	0	0	0	0	211	269797	256314	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1264369
		METERED DEMAND:	1112.7	1033	730.7	0	0	0	0	0	0	212.2	869.1	924.5	
		BILLING DEMAND:	1112.7	1033	730.7	0	0	0	0	0	0	768.9	869.1	924.5	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	10649	9886	6984	0	0	0	0	0	0	10	8317	8847	44693
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	219	267292	273985	317337	328044	340528	321932	290209	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	2139505
		METERED DEMAND:	0	0	219.4	725.9	758.6	810.9	810.4	806.9	922.2	768.9	0	0	
		BILLING DEMAND:	0	0	730.7	725.9	758.6	810.9	810.4	806.9	922.2	768.9	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	9	6947	7259	7760	7756	7722	8825	7349	0	0	53628
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	60842	61998	80240	0	0	0	0	0	0	0	78065	71767	
		BILLING ENERGY:	60842	61998	80240	0	0	0	0	0	0	0	78065	71767	352912
		METERED DEMAND:	670.7	693.5	701.2	0	0	0	0	0	0	0	744.8	698.6	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	2961	3017	3904	0	0	0	0	0	0	0	3799	3492	17173
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	183915	165351	185661	0	0	0	0	0	0	211	191732	184547	
		BILLING ENERGY:	183915	165351	185661	0	0	0	0	0	0	211	191732	184547	911418
		METERED DEMAND:	1112.7	1033	730.7	0	0	0	0	0	0	212.2	869.1	924.5	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	7870	7075	7944	0	0	0	0	0	0	9	8204	7897	39000
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	113800	108271	135694	133264	142304	134946	114341	0	0	
		BILLING ENERGY:	0	0	0	113800	108271	135694	133264	142304	134946	114341	0	0	882620
		METERED DEMAND:	0	0	0	725.9	758.6	810.9	810.4	806.9	922.2	768.9	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	5537	5268	6603	6485	6925	6566	5564	0	0	42948
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	219	153492	165714	181642	194780	198224	186987	175868	0	0	
		BILLING ENERGY:	0	0	219	153492	165714	181642	194780	198224	186987	175868	0	0	1256926
		METERED DEMAND:	0	0	219.4	716.8	712.7	776.7	784.8	775.5	783.3	751.2	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	9	6568	7091	7772	8335	8482	8001	7525	0	0	53784
DPub	li	c Safety Building								DOE-2.2-	48y 12	/11/2017	0.5 0.33	BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL Cl	LC-1D					WEATHE	R FILE-	W Palm	BeachFL	TMY2
													----(CON	TINUED)-	
		TOTAL ENERGY:	244757	227349	266120	267292	273985	317337	328043	340528	321932	290420	269797	256314	3403875
		TOTAL CHARGES ($):	21479	19978	18851	19052	19619	22136	22575	23129	23393	20457	20320	20236	251225
		Billed kW Savings	0.6	0.6	2.8	2.8	2.8	2.9	2.9	2.9	2.5	2.7	0.6	0.6	24.7
		On-Peak kWh Savings	202	206	324	556	456	547	529	557	524	463	356	282	5,002
		Off-Peak kWh Savings	641	589	807	705	845	915	1,004	998	956	898	796	854	10,008
		Total kWh Savings	843	795	1,131	1,261	1,301	1,462	1,533	1,555	1,480	1,361	1,152	1,136	15,010

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM M-8 New AHUs

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	239837	221195	256680	0	0	0	0	0	0	204	256134	247117	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1221197
		METERED DEMAND:	1042.5	972.3	710	0	0	0	0	0	0	204.4	866.9	918.9	
		BILLING DEMAND:	1042.5	972.3	710	0	0	0	0	0	0	741.5	866.9	918.9	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	9977	9304	6785	0	0	0	0	0	0	10	8297	8794	43167
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	210	256114	258617	299974	308349	321152	302929	274971	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	2022284
		METERED DEMAND:	0	0	210.2	716.5	722.9	765.8	765.1	764.7	787.6	741.5	0	0	
		BILLING DEMAND:	0	0	710	716.5	722.9	765.8	765.1	764.7	787.6	741.5	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	9	6857	6918	7328	7322	7318	7538	7087	0	0	50378
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	59948	60310	76965	0	0	0	0	0	0	0	72843	69202	
		BILLING ENERGY:	59948	60310	76965	0	0	0	0	0	0	0	72843	69202	339268
		METERED DEMAND:	564.5	669.4	676.3	0	0	0	0	0	0	0	710.4	674.6	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	2917	2935	3745	0	0	0	0	0	0	0	3545	3367	16509
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	179889	160885	179715	0	0	0	0	0	0	204	183291	177915	
		BILLING ENERGY:	179889	160885	179715	0	0	0	0	0	0	204	183291	177915	881899
		METERED DEMAND:	1042.5	972.3	710	0	0	0	0	0	0	204.4	866.9	918.9	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	7697	6884	7690	0	0	0	0	0	0	9	7843	7613	37736
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	107628	100731	128713	125985	135113	127909	108011	0	0	
		BILLING ENERGY:	0	0	0	107628	100731	128713	125985	135113	127909	108011	0	0	834089
		METERED DEMAND:	0	0	0	697.1	722.9	765.8	765.1	764.7	787.6	741.5	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	5237	4902	6263	6130	6575	6224	5256	0	0	40587
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	210	148486	157885	171261	182364	186039	175020	166960	0	0	
		BILLING ENERGY:	0	0	210	148486	157885	171261	182364	186039	175020	166960	0	0	1188225
		METERED DEMAND:	0	0	210.2	716.5	684.6	735.5	742.8	734.6	741.4	715.6	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	9	6354	6756	7328	7803	7961	7489	7144	0	0	50844
DPub	ll	c Safety Building								DOE-2 2-	48y 12	/11/2017	0.500694	0:31 BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL Cl	LC-1D					WEATHE	R FILE-	W Palm	BeachFL	TMY2
													----(CON	TINUED)-	
			#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######
		TOTAL ENERGY:	239837	221195	256890	256114	258616	299974	308348	321152	302929	275174	256134	247117	3243481
		TOTAL CHARGES ($):	20592	19123	18239	18448	18576	20920	21256	21854	21251	19505	19684	19774	239222
		Billed kW Savings:	70.2	60.7	20.7	9.4	35.7	45.1	45.3	42.2	134.6	27.4	2.2	5.6	499.1
		On-Peak kWh Savings	894	1,688	3,275	6,172	7,540	6,981	7,279	7,191	7,037	6,330	5,222	2,565	62,174
		Off-Peak kWh Savings	4,026	4,466	5,955	5,006	7,829	10,381	12,416	12,185	11,967	8,915	8,441	6,632	98,219
		Total kWh Savings	4,920	6,154	9,230	11,178	15,369	17,362	19,695	19,376	19,004	15,245	13,663	9,197	160,393

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM M-12 Smoke Damper Replacement

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	238523	219118	253072	0	0	0	0	0	0	201	249401	244960	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1205303
		METERED DEMAND:	1029	974.8	710.7	0	0	0	0	0	0	201.9	865.3	918.3	
		BILLING DEMAND:	1029	974.8	710.7	0	0	0	0	0	0	729.1	865.3	918.3	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	9848	9329	6792	0	0	0	0	0	0	9	8281	8788	43048
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	207	252287	252920	292118	300937	313565	294887	269371	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1976265
		METERED DEMAND:	0	0	207	718.5	710	748.9	748.2	750.2	766.3	729.1	0	0	
		BILLING DEMAND:	0	0	710.7	718.5	710	748.9	748.2	750.2	766.3	729.1	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	9	6876	6794	7167	7160	7179	7333	6968	0	0	49486
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	59769	59924	76148	0	0	0	0	0	0	0	70622	68501	
		BILLING ENERGY:	59769	59924	76148	0	0	0	0	0	0	0	70622	68501	334964
		METERED DEMAND:	557.2	576.1	579.8	0	0	0	0	0	0	0	697.9	578.2	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	2908	2916	3705	0	0	0	0	0	0	0	3436	3333	16299
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	178754	159195	176924	0	0	0	0	0	0	201	178779	176459	
		BILLING ENERGY:	178754	159195	176924	0	0	0	0	0	0	201	178779	176459	870312
		METERED DEMAND:	1029	974.8	710.7	0	0	0	0	0	0	201.9	865.3	918.3	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	7649	6812	7571	0	0	0	0	0	0	9	7650	7551	37241
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	105932	97949	125179	122815	132341	124196	105366	0	0	
		BILLING ENERGY:	0	0	0	105932	97949	125179	122815	132341	124196	105366	0	0	813778
		METERED DEMAND:	0	0	0	686.2	710	748.9	748.2	750.2	766.3	729.1	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	5155	4766	6091	5976	6440	6043	5127	0	0	39598
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	207	146355	154972	166939	178122	181224	170691	164005	0	0	
		BILLING ENERGY:	0	0	207	146355	154972	166939	178122	181224	170691	164005	0	0	1162515
		METERED DEMAND:	0	0	207	718.5	677.4	720.7	727.6	719.8	726	702.8	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	9	6263	6631	7143	7622	7755	7304	7018	0	0	49744
DPub	li	c Safety Building								DOE-2.2-	48y 12	/11/2017	0.500694	9.46 BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL CI	LC-1D					WEATHE	R FILE-	W. Palm	BeachFL	TMY2
													----(CON	TINUED)-	
		TOTAL ENERGY:	238523	219118	253279	252287	252920	292118	300937	313565	294887	269572	249401	244960	3181569
		TOTAL CHARGES ($):	20405	19057	18086	18293	18192	20401	20758	21373	20680	19131	19368	19672	235416
		Billed kW Savings:	13.5	-2.5	0.7	-2	12.9	16.9	16.9	14.5	21.3	12.4	1.6	0.6	105.4
		On-Peak kWh Savings	179	386	817	1,696	2,782	3,534	3,170	2,772	3,713	2,645	2,221	701	24,616
		Off-Peak kWh Savings	1,135	1,690	2,794	2,131	2,913	4,322	4,242	4,815	4,329	2,958	4,512	1,456	37,297
		Total kWh Savings	1,314	2,076	3,611	3,827	5,695	7,856	7,412	7,587	8,042	5,603	6,733	2,157	61,913

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

ECM M-13 Mech Rm Cooling

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	228903	211491	246715	0	0	0	0	0	0	201	241630	236219	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1165177
		METERED DEMAND:	992.4	933	686.9	0	0	0	0	0	0	201.9	807	838.5	
		BILLING DEMAND:	992.4	933	686.9	0	0	0	0	0	0	725	807	838.5	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	9497	8929	6565	0	0	0	0	0	0	9	7723	8025	40747
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	197	246547	246658	286684	295385	308016	289562	262485	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1935517
		METERED DEMAND:	0	0	197.7	687.3	710.8	749.5	748.8	750.6	767	725	0	0	
		BILLING DEMAND:	0	0	686.9	687.3	710.8	749.5	748.8	750.6	767	725	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	9	6578	6802	7173	7166	7183	7340	6929	0	0	49180
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	59573	59757	76021	0	0	0	0	0	0	0	70494	68267	
		BILLING ENERGY:	59573	59757	76021	0	0	0	0	0	0	0	70494	68267	334112
		METERED DEMAND:	561.9	576.3	580.8	0	0	0	0	0	0	0	697.6	578.4	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	2899	2908	3699	0	0	0	0	0	0	0	3430	3322	16258
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	169331	151734	170694	0	0	0	0	0	0	201	171136	167952	
		BILLING ENERGY:	169331	151734	170694	0	0	0	0	0	0	201	171136	167952	831048
		METERED DEMAND:	992.4	933	686.9	0	0	0	0	0	0	201.9	807	838.5	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	7246	6493	7304	0	0	0	0	0	0	9	7323	7187	35561
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	106103	98171	125367	122840	132376	124240	105255	0	0	
		BILLING ENERGY:	0	0	0	106103	98171	125367	122840	132376	124240	105255	0	0	814352
		METERED DEMAND:	0	0	0	687.3	710.8	749.5	748.8	750.6	767	725	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	5163	4777	6100	5977	6441	6046	5122	0	0	39626
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	197	140443	148487	161318	172545	175640	165322	157231	0	0	
		BILLING ENERGY:	0	0	197	140443	148487	161318	172545	175640	165322	157231	0	0	1121182
		METERED DEMAND:	0	0	197.7	676	678.5	721.9	728.8	720.8	727	703.9	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	8	6010	6354	6903	7383	7516	7074	6728	0	0	47975
DPub	ll	c Safety Building								DOE-2.2-	48y 12	/11/2017	0.502083	1:32 BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL Cl	LC-1D					WEATHE	R FILE-	W. Palm	BeachFL	TMY2
													---(CON	TINUED)-	
		TOTAL ENERGY:	228903	211491	246913	246547	246658	286684	295385	308016	289561	262687	241630	236219	3100694
		TOTAL CHARGES ($):	19642	18329	17585	17750	17933	20176	20527	21140	20460	18796	18476	18533	229347
		Billed kW Savings:	36.6	41.8	23.8	31.2	-0.8	-0.6	-0.6	-0.4	-0.7	4.1	59.3	79.8	272.5
		On-Peak kWh Savings	196	167	127	-171	-222	-188	-25	-35	-44	111	128	234	278
		Off-Peak kWh Savings	9,423	7,461	6,240	5,912	6,485	5,621	5,577	5,584	5,369	6,774	7,643	8,507	80,596
		Total kWh Savings	9,619	7,628	6,367	5,741	6,263	5,433	5,552	5,549	5,325	6,885	7,771	8,741	80,874

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM M-15 Replace Liebert Cus

BLOC	K-	CHARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Cust	1	Elec Uniform Blk1													
		USE:	SEASONAL												
		METERED ENERGY:	228747	211331	246504	0	0	0	0	0	0	201	241442	236044	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1164285
		METERED DEMAND:	992.4	933	686.3	0	0	0	0	0	0	201.8	806.9	838.5	
		BILLING DEMAND:	992.4	933	686.3	0	0	0	0	0	0	724.3	806.9	838.5	
		PRORATE FACTOR:	1	1	0.9987	0	0	0	0	0	0	0.0013	1	1	
		DEMAND CHGS($):	9497	8929	6559	0	0	0	0	0	0	9	7722	8025	40741
Cust	1	Elec Uniform Blk2													
		USE:	SEASONAL												
		METERED ENERGY:	0	0	197	246331	246438	286436	295128	307750	289323	262269	0	0	
		BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1933854
		METERED DEMAND:	0	0	197.5	686.7	710.1	748.8	748.1	749.9	766.4	724.3	0	0	
		BILLING DEMAND:	0	0	686.3	686.7	710.1	748.8	748.1	749.9	766.4	724.3	0	0	
		PRORATE FACTOR:	0	0	0.0013	1	1	1	1	1	1	0.9987	0	0	
		DEMAND CHGS($):	0	0	9	6572	6796	7166	7159	7177	7334	6922	0	0	49136
Cust	1	Elec TOU S1-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	59528	59710	75957	0	0	0	0	0	0	0	70438	68215	
		BILLING ENERGY:	59528	59710	75957	0	0	0	0	0	0	0	70438	68215	333848
		METERED DEMAND:	561.4	575.8	580.2	0	0	0	0	0	0	0	697.1	577.8	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	2897	2906	3696	0	0	0	0	0	0	0	3428	3319	16245
Cust	1	Elec TOU S1-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	169219	151620	170547	0	0	0	0	0	0	201	171004	167829	
		BILLING ENERGY:	169219	151620	170547	0	0	0	0	0	0	201	171004	167829	830421
		METERED DEMAND:	992.4	933	686.3	0	0	0	0	0	0	201.8	806.9	838.5	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	7241	6488	7298	0	0	0	0	0	0	9	7317	7181	35534
Cust	1	Elec TOU S2-OnPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	0	106000	98078	125254	122732	132261	124135	105161	0	0	
		BILLING ENERGY:	0	0	0	106000	98078	125254	122732	132261	124135	105161	0	0	813622
		METERED DEMAND:	0	0	0	686.7	710.1	748.8	748.1	749.9	766.4	724.3	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	0	5158	4772	6095	5972	6436	6040	5117	0	0	39591
Cust	1	Elec TOU S2-OffPk													
		USE:	TIME-OF-	USE											
		METERED ENERGY:	0	0	197	140330	148360	161182	172396	175489	165188	157108	0	0	
		BILLING ENERGY:	0	0	197	140330	148360	161182	172396	175489	165188	157108	0	0	1120250
		METERED DEMAND:	0	0	197.5	675.5	677.9	721.3	728.2	720.2	726.4	703.3	0	0	
		BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
		ENERGY CHGS($):	0	0	8	6005	6348	6897	7377	7509	7068	6723	0	0	47935
DPub	ll	c Safety Building								DOE-2.2-	48y 12	/11/2017	0.502083 9:23	BD	L RUN 1
REPO	RT	#NAME?	s and Rat	chets fo	r FPL Cl	LC-1D					WEATHE	R FILE-	W. Palm	BeachFL	TMY2
													----(CON	TINUED)-	
		TOTAL ENERGY:	228747	211331	246701	246331	246438	286436	295128	307750	289323	262470	241442	236044	3098140
		TOTAL CHARGES ($):	19635	18322	17570	17734	17917	20158	20508	21122	20443	18780	18467	18526	229182
		Billed kW Savings:	0	0	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.1	0	5.4
		On-Peak kWh Savings	45	47	64	103	93	113	108	115	105	94	56	52	995
		Off-Peak kWh Savings	112	114	147	113	127	136	149	151	134	123	132	123	1,561
		Total kWh Savings	157	161	211	216	220	249	257	266	239	217	188	175	2,556

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split System - Savings Summary

Facility Public Safety Complex
Unit Location PSB

Existing Conditions
Mfg Various
Model #
Date Mfg

Baseline Data	
Peak kW	22
kWh	114,840

Proposed Conditions
Mfg TBD
Model #

Energy Usage

Existing Conditions

00-08 Hrs	36.5	kW	12,701	kWh	0	Therms
09-16 Hrs	36.5	kW	37,918	kWh	0	Therms
17-00 Hrs	36.5	kW	20,950	kWh	0	Therms
Total	**36.5**	**kW**	**71,569**	**kWh**	**0**	**Therms**
	166.0%		*62.3%*			

Proposed Conditions

00-08 Hrs	29.5	kW	10,245	kWh	0	Therms
09-16 Hrs	29.5	kW	30,587	kWh	0	Therms
17-00 Hrs	29.5	kW	16,900	kWh	0	Therms
Total	**29.5**	**kW**	**57,731**	**kWh**	**0**	**Therms**
	133.9%		*50.3%*			

Unadjusted Annual Savings		
	7.1	kW
	13,837	kWh
	0	Therms

Adjusted for BAS	
7.1	**kW**
12298	**kWh**

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	Public Safety Complex
Unit Location	PSB
Mfg	Various
Model #	0

**RED TEXT IS INPUT

Estimated SF Served by Unit	10000	SF	
Max Cooling Load	300.0	kbtu/hr	400SF/Ton
Max Heating Load	125.0	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	92	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	10		
Average internal heat gain	1.3	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	16,666.7	btu/h-degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	4166.7	btu/h-degF	
Tbal - Heating	69.7	deg-F	
DX Cooling System	27	tons	
	324	kbtu/hr	
	9.875	New EER/SEER/IPLV	
	1.215	kW/Ton	
	11	Age of Unit (yrs)	
	36.51	Full Load kW (degraded 1% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	11	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	0.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
	Roof	Trane	[illegible]	2008	9.5	
	Roof	Trane	SCD60A1B0A002	2007	10	
	Roof	Trane	TSCD36A4E0A001	2007	10	
	Roof	Carrier	50TM-005--V601	2007	10	

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	28.1	0	468.0	303.8	1.000	303.8	36.51	1.00	0
97	23.1	0	384.7	316.4	1.000	316.4	36.51	1.00	0
92	18.1	0	301.3	329.0	1.000	329.0	36.51	0.92	0
87	13.1	54	218.0	341.7	1.000	341.7	36.51	0.64	1,258
82	8.1	643	134.7	354.3	1.000	354.3	36.51	0.38	8,924
77	3.1	869	51.3	366.9	1.000	366.9	36.51	0.14	4,439
72	-1.9	624	-32.0	379.6	1.000	379.6	36.51	-0.08	-1,921
		2,190							12,701

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.7	165	-32.0	0.0	1.000	0.0	0.00	-2,728.05	0	-32.01	-9.38	0
57	12.7	123	-52.8	0.0	1.000	0.0	0.00	-4,751.20	0	-52.84	-15.48	0
52	17.7	80	-73.7	0.0	1.000	0.0	0.00	-7,009.20	0	-73.68	-21.59	0
47	22.7	43	-94.5	0.0	1.000	0.0	0.00	-9,545.45	0	-94.51	-27.69	0
42	27.7	15	-115.3	0.0	1.000	0.0	0.00	-12,414.78	0	-115.34	-33.80	0
37	32.7	5	-136.2	0.0	1.000	0.0	0.00	-15,687.40	0	-136.18	-39.90	0
32	37.7	2	-157.0	0.0	1.000	0.0	0.00	-19,454.77	0	-157.01	-46.00	0
27	42.7	0	-177.8	0.0	1.000	0.0	0.00	-23,838.25	0	-177.84	-52.11	0
22	47.7	0	-198.7	0.0	1.000	0.0	0.00	-29,002.43	0	-198.67	-58.21	0
17	52.7	0	-219.5	0.0	1.000	0.0	0.00	-35,176.28	0	-219.51	-64.32	0
12	57.7	0	-240.3	0.0	1.000	0.0	0.00	-42,687.98	0	-240.34	-70.42	0
		433							0			0

Total Cooling kW Demand	36.5	kW
Total Cooling kWh Consumption	12,701	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	Public Safety Complex
Unit Location	PSB
Mfg	Various
Model #	0

RED TEXT IS INPUT

Estimated SF Served by Unit	10000	SF	
Max Cooling Load	300.0	kbtu/hr	400SF/Ton
Max Heating Load	400.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	92	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	10		
Average internal heat gain	1.3	kbtu/hr	
Inside Cooling Design Temp	74	deg F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	16,666.7	btu/h-degF	
Tbal - Cooling	73.9	deg F	
Ktot - Heating	-13333.3	btu/h-degF	
Tbal - Heating	69.9	deg F	
DX Cooling System	27	tons	
	324	kbtu/hr	
	9.875	New EER/SEER/IPLV	
	1.215	kW/Ton	
	10.75	Age of Unit (yrs)	
	36.51	Full Load kW (degraded 1% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	11	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	468.0	303.8	1.000	303.8	36.51	1.00	0.00	0
97	23.1	5	384.7	316.4	1.000	316.4	36.51	1.00	1.58	183
92	18.1	174	301.3	329.0	1.000	329.0	36.51	0.92	52.43	5,819
87	13.1	787	218.0	341.7	1.000	341.7	36.51	0.64	171.57	18,336
82	8.1	816	134.7	354.3	1.000	354.3	36.51	0.38	109.89	11,325
77	3.1	609	51.3	366.9	1.000	366.9	36.51	0.14	31.26	3,111
72	-1.9	278	-32.0	379.6	1.000	379.6	36.51	-0.08	-8.90	-856
		2,669							357.83	37,918

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.9	70	-105.3	0.0	1.000	0.0	0.00	-8,979.82	-73.73	0	-105.35	-30.87	0
57	12.9	34	-172.0	0.0	1.000	0.0	0.00	-15,467.63	-5.85	0	-172.01	-50.40	0
52	17.9	17	-238.7	0.0	1.000	0.0	0.00	-22,708.53	-4.06	0	-238.68	-69.93	0
47	22.9	5	-305.3	0.0	1.000	0.0	0.00	-30,841.75	-1.53	0	-305.34	-89.47	0
42	27.9	2	-372.0	0.0	1.000	0.0	0.00	-40,043.06	-0.74	0	-372.01	-109.00	0
37	32.9	1	-438.7	0.0	1.000	0.0	0.00	-50,537.63	-0.44	0	-438.68	-128.53	0
32	37.9	0	-505.3	0.0	1.000	0.0	0.00	-62,618.75	0.00	0	-505.34	-148.07	0
27	42.9	0	-572.0	0.0	1.000	0.0	0.00	-76,675.60	0.00	0	-572.01	-167.60	0
22	47.9	0	-638.7	0.0	1.000	0.0	0.00	-93,236.01	0.00	0	-638.67	-187.13	0
17	52.9	0	-705.3	0.0	1.000	0.0	0.00	-113,034.19	0.00	0	-705.34	-206.66	0
12	57.9	0	-772.0	0.0	1.000	0.0	0.00	-137,122.56	0.00	0	-772.01	-226.20	0
		129								0			0

Total Cooling kW Demand	36.5	kW
Total Cooling kWh Consumption	37,918	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage

17 Hour - 00 Hour: Existing Conditions

Facility	Public Safety Complex
Unit Location	PSB
Mfg	Various
Model #	0

RED TEXT IS INPUT

Estimated SF Served by Unit	10000	SF	
Max Cooling Load	300.0	kbtu/hr	400SF/Ton
Max Heating Load	400.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	92	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	10		
Average internal heat gain	1.3	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	16,666.7	btu/h-degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	-13333.3	btu/h-degF	
Tbal - Heating	69.9	deg-F	
DX Cooling System	27	tons	
	324	kbtu/hr	
	9.875	New EER/SEER/IPLV	
	1.215	kW/Ton	
	10.75	Age of Unit (yrs)	
	36.51	Full Load kW (degraded 1% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	11	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	468.0	303.8	1.000	303.8	36.51	1.00	0.00	0
97	23.1	1	384.7	316.4	1.000	316.4	36.51	1.00	0.32	37
92	18.1	11	301.3	329.0	1.000	329.0	36.51	0.92	3.31	368
87	13.1	275	218.0	341.7	1.000	341.7	36.51	0.64	59.95	6,407
82	8.1	821	134.7	354.3	1.000	354.3	36.51	0.38	110.56	11,395
77	3.1	862	51.3	366.9	1.000	366.9	36.51	0.14	44.25	4,403
72	-1.9	539	-32.0	379.6	1.000	379.6	36.51	-0.08	-17.25	-1,859
		2,509							201.14	20,950

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.9	106	-105.3	0.0	1.000	0.0	0.00	-8,979.82	-11.17	0	-105.35	-30.87	0
57	12.9	60	-172.0	0.0	1.000	0.0	0.00	-15,467.63	-10.32	0	-172.01	-50.40	0
52	17.9	31	-238.7	0.0	1.000	0.0	0.00	-22,708.53	-7.40	0	-238.68	-69.93	0
47	22.9	10	-305.3	0.0	1.000	0.0	0.00	-30,841.75	-3.05	0	-305.34	-89.47	0
42	27.9	3	-372.0	0.0	1.000	0.0	0.00	-40,043.06	-1.12	0	-372.01	-109.00	0
37	32.9	1	-438.7	0.0	1.000	0.0	0.00	-50,537.63	-0.44	0	-438.68	-128.53	0
32	37.9	0	-505.3	0.0	1.000	0.0	0.00	-62,618.75	0.00	0	-505.34	-148.07	0
27	42.9	0	-572.0	0.0	1.000	0.0	0.00	-76,675.60	0.00	0	-572.01	-167.60	0
22	47.9	0	-638.7	0.0	1.000	0.0	0.00	-93,236.01	0.00	0	-638.67	-187.13	0
17	52.9	0	-705.3	0.0	1.000	0.0	0.00	-113,034.19	0.00	0	-705.34	-206.66	0
12	57.9	0	-772.0	0.0	1.000	0.0	0.00	-137,122.56	0.00	0	-772.01	-226.20	0
		211								0			0

Total Cooling kW Demand	36.5	kW
Total Cooling kWh Consumption	20,950	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

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Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility Public Safety Complex
Unit Location PSB
Mfg
Model #

**RED TEXT IS INPUT

Estimated SF Served by Unit	10000	SF	
Max Cooling Load	200.0	kbtu/hr	400SF/Ton
Max Heating Load	125.0	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	92	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	10		
Average internal heat gain	1.3	kbtu/hr	
Inside Cooling Design Temp	79	deg F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	16,666.7	btu/h.degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	-4166.7	btu/h.degF	
Tbal - Heating	69.7	deg-F	
DX Cooling System	27	tons	
	224	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	29.45	Full Load kW (degraded 1% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	11	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	468.0	303.8	1.000	303.8	29.45	1.00	0.00	0
97	23.1	0	384.7	316.4	1.000	316.4	29.45	1.00	0.00	0
92	18.1	0	301.3	329.0	1.000	329.0	29.45	0.92	0.00	0
87	13.1	54	218.0	341.7	1.000	341.7	29.45	0.64	11.77	1,015
82	8.1	643	134.7	354.3	1.000	354.3	29.45	0.38	86.59	7,199
77	3.1	869	51.3	366.9	1.000	366.9	29.45	0.14	44.61	3,581
72	-1.9	624	-32.0	379.6	1.000	379.6	29.45	-0.08	-19.97	-1,550
		2,190							123.00	10,245

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.7	165	-32.0	0.0	1.000	0.0	0.00	-2,728.05	-5.28	0	-32.01	-9.38	0
57	12.7	123	-52.8	0.0	1.000	0.0	0.00	-4,751.20	-6.50	0	-52.84	-15.48	0
52	17.7	80	-73.7	0.0	1.000	0.0	0.00	-7,009.20	-5.89	0	-73.68	-21.59	0
47	22.7	43	-94.5	0.0	1.000	0.0	0.00	-9,545.45	-4.06	0	-94.51	-27.69	0
42	27.7	15	-115.3	0.0	1.000	0.0	0.00	-12,414.78	-1.73	0	-115.34	-33.80	0
37	32.7	5	-136.2	0.0	1.000	0.0	0.00	-15,687.40	-0.68	0	-136.18	-39.90	0
32	37.7	2	-157.0	0.0	1.000	0.0	0.00	-19,454.77	-0.31	0	-157.01	-46.00	0
27	42.7	0	-177.8	0.0	1.000	0.0	0.00	-23,838.25	0.00	0	-177.84	-52.11	0
22	47.7	0	-198.7	0.0	1.000	0.0	0.00	-29,002.43	0.00	0	-198.67	-58.21	0
17	52.7	0	-219.5	0.0	1.000	0.0	0.00	-35,176.28	0.00	0	-219.51	-64.32	0
12	57.7	0	-240.3	0.0	1.000	0.0	0.00	-42,687.98	0.00	0	-240.34	-70.42	0
		433								0			0

Total Cooling kW Demand	29.5	kW
Total Cooling kWh Consumption	10,245	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

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Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	Public Safety Complex
Unit Location	PSB
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	10000	SF	
Max Cooling Load	300.0	kbtu/hr	400SF/Ton
Max Heating Load	400.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	92	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	10		
Average internal heat gain	1.3	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	16,666.7	btu/h-degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	-13333.3	btu/h-degF	
Tbal - Heating	69.9	deg-F	
DX Cooling System	27	tons	
	324	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	29.46	Full Load kW (degraded 1% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	468.0	303.8	1.000	303.8	29.45	1.00	0.00	0
97	23.1	5	384.7	316.4	1.000	316.4	29.45	1.00	1.58	147
92	18.1	174	301.3	329.0	1.000	329.0	29.45	0.92	52.43	4,694
87	13.1	787	218.0	341.7	1.000	341.7	29.45	0.64	171.57	14,791
82	8.1	816	134.7	354.3	1.000	354.3	29.45	0.38	109.89	9,136
77	3.1	609	51.3	366.9	1.000	366.9	29.45	0.14	31.26	2,509
72	-1.9	278	-32.0	379.6	1.000	379.6	29.45	-0.08	-8.90	-690
		2,669							357.83	30,587

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.9	70	-105.3	0.0	1.000	0.0	0.00	-8,979.82	-7.37	0	-105.35	-30.87	0
57	12.9	34	-172.0	0.0	1.000	0.0	0.00	-15,467.63	-5.85	0	-172.01	-50.40	0
52	17.9	17	-238.7	0.0	1.000	0.0	0.00	-22,708.53	-4.06	0	-238.68	-69.93	0
47	22.9	5	-305.3	0.0	1.000	0.0	0.00	-30,841.75	-1.53	0	-305.34	-89.47	0
42	27.9	2	-372.0	0.0	1.000	0.0	0.00	-40,043.06	-0.74	0	-372.01	-109.00	0
37	32.9	1	-438.7	0.0	1.000	0.0	0.00	-50,537.63	-0.44	0	-438.68	-128.53	0
32	37.9	0	-505.3	0.0	1.000	0.0	0.00	-62,618.75	0.00	0	-505.34	-148.07	0
27	42.9	0	-572.0	0.0	1.000	0.0	0.00	-76,675.60	0.00	0	-572.01	-167.60	0
22	47.9	0	-638.7	0.0	1.000	0.0	0.00	-93,236.01	0.00	0	-638.67	-187.13	0
17	52.9	0	-705.3	0.0	1.000	0.0	0.00	-113,034.19	0.00	0	-705.34	-206.66	0
12	57.9	0	-772.0	0.0	1.000	0.0	0.00	-137,122.56	0.00	0	-772.01	-226.20	0
		129								0			0

Total Cooling kW Demand	29.5	kW
Total Cooling kWh Consumption	30,587	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	Public Safety Complex
Unit Location	PSB
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	10000	SF	
Max Cooling Load	300.0	kbtu/hr	400SF/Ton
Max Heating Load	400.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	92	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	10		
Average internal heat gain	1.3	kbtu/hr	
Inside Cooling Design Temp	74	deg F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	16,666.7	btu/h-degF	
Tbal - Cooling	73.9	deg F	
Ktot - Heating	-13333.3	btu/h-degF	
Tbal - Heating	69.9	deg F	
DX Cooling System	27	tons	
	324	kbtu/hr	
	11	New EER/SEER/IPLV	
	1.091	kW/Ton	
	0	Age of Unit (yrs)	
	29.45	Full Load kW (degraded 1% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	0	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	468.0	303.8	1.000	303.8	29.45	1.00	0.00	0
97	23.1	1	384.7	316.4	1.000	316.4	29.45	1.00	0.32	29
92	18.1	11	301.3	329.0	1.000	329.0	29.45	0.92	3.31	297
87	13.1	275	218.0	341.7	1.000	341.7	29.45	0.64	59.95	5,168
82	8.1	821	134.7	354.3	1.000	354.3	29.45	0.38	110.56	9,192
77	3.1	862	51.3	366.9	1.000	366.9	29.45	0.14	44.25	3,552
72	-1.9	539	-32.0	379.6	1.000	379.6	29.45	-0.08	-17.25	-1,338
		2,509							201.14	16,900

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.9	106	-105.3	0.0	1.000	0.0	0.00	-8,979.82	-11.17	0	-105.35	-30.87	0
57	12.9	60	-172.0	0.0	1.000	0.0	0.00	-15,467.63	-10.32	0	-172.01	-50.40	0
52	17.9	31	-238.7	0.0	1.000	0.0	0.00	-22,708.53	-7.40	0	-238.68	-69.93	0
47	22.9	10	-305.3	0.0	1.000	0.0	0.00	-30,841.75	-3.05	0	-305.34	-89.47	0
42	27.9	3	-372.0	0.0	1.000	0.0	0.00	-40,043.06	-1.12	0	-372.01	-109.00	0
37	32.9	1	-438.7	0.0	1.000	0.0	0.00	-50,537.63	-0.44	0	-438.68	-128.53	0
32	37.9	0	-505.3	0.0	1.000	0.0	0.00	-62,618.75	0.00	0	-505.34	-148.07	0
27	42.9	0	-572.0	0.0	1.000	0.0	0.00	-76,675.60	0.00	0	-572.01	-167.60	0
22	47.9	0	-638.7	0.0	1.000	0.0	0.00	-93,236.01	0.00	0	-638.67	-187.13	0
17	52.9	0	-705.3	0.0	1.000	0.0	0.00	-113,034.19	0.00	0	-705.34	-206.66	0
12	57.9	0	-772.0	0.0	1.000	0.0	0.00	-137,122.56	0.00	0	-772.01	-226.20	0
		211								0			0

Total Cooling kW Demand	29.5	kW
Total Cooling kWh Consumption	16,900	kWh
Total Heating kWh Consumption	0	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Public Safety Complex - Logistics Warehouse
Optimize HVAC Schedules and Set Points - AHU-1

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:
Fan operation type: CV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 100% — Not applicable to "CV"

Total fan motor hp: 5.0 hp
Motor load factor: 75%
Existing average motor eff: 87.5%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):
Full load heating: 55 MBtuh — Full load cooling: 14.7 tons
Heating efficiency: 100% — Avg. Cooling efficiency: 1.09 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at: 40° — Cooling full load at: 92°
Heating zero load at: 65° — Cooling zero load at: 70°
Delta: 25° — Delta: 22°

Annual Cooling Savings: 18,741 kWh
Annual Heating Savings: 2,607 kWh
(No Electric Demand Savings Claimed)

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Baseline Cooling Energy: 65,069 kWh
Baseline Heating Energy: 6,335 kWh (Electric Conversion)

EFLHs: 4452.688 Hours

Existing
Unoccupied setback ends: 0
Unoccupied setback begins: 24
Weekends unoccupied?: Yes (Yes / No)

Proposed
Unoccupied setback ends: 6
Unoccupied setback begins: 20
Weekends unoccupied?: Yes (Yes / No)

Utility Baseline: 114,840 kWh

Existing:
Occupied cooling space temperature: 74°
Cooling setup temperature: 74°
Fan mode during unoccupied cooling: Off

Proposed:
Occupied cooling space temperature: 74°
Cooling setup temperature: 80°
Fan mode during unoccupied cooling: Off — **On, Off, Cycle**

Interior Lighting	27,157	kWh	23.6%
Exterior Lighting	2,604	kWh	2.3%
Misc Equipment	8,892	kWh	7.7%
HVAC	71,405	kWh	62.2%
	110,038		95.8%

0.5 W/SF

Existing:
Occupied heating space temperature: 70°
Heating setback temperature: 70°
Fan mode during unoccupied heating: Off

Proposed:
Occupied heating space temperature: 70°
Heating setback temperature: 60°
Fan mode during unoccupied heating: Off — **On, Off, Cycle**

Existing:
Occupied Percent Outside Air: 10%
Unoccupied Percent Outside Air: 0%

Proposed:
Occupied Percent Outside Air: 10%
Unoccupied Percent Outside Air: 0%

Total Savings: 21,347 kWh 18.6%

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (off)	ConstVol Fan Proposed (off)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
97.5°	2.9	2.9	100%	100%	100%	100%	3.2	3.2	16.0	16.0	1.1	1.1	100%	94%	100%	100%	0.0	0.0	16.0	15.0	0	1
92.5°	130.0	126.4	100%	100%	100%	100%	3.2	3.2	16.0	16.0	52.0	55.6	93%	73%	100%	100%	0.0	0.0	14.9	11.7	11	181
87.5°	784.3	660.4	80%	80%	100%	100%	3.2	3.2	12.8	12.8	314.7	438.6	72%	52%	100%	100%	0.0	0.0	11.6	8.4	396	1,530
82.5°	1560.0	933.2	57%	57%	100%	100%	3.2	3.2	9.1	9.1	625.0	1251.8	52%	32%	100%	100%	0.0	0.0	8.3	5.1	2,003	4,501
77.5°	1437.1	728.4	34%	34%	100%	100%	3.2	3.2	5.5	5.5	574.9	1263.6	31%	11%	100%	100%	0.0	0.0	5.0	1.8	2,265	4,436
72.5°	721.4	338.0	11%	11%	100%	100%	3.2	3.2	1.0	1.0	200.6	672.0	10%	0%	100%	100%	0.0	0.0	1.7	0.0	1,225	1,177
67.5°	277.1	125.9	0%	0%	100%	100%	3.2	3.2	0.0	0.0	112.9	264.1	0%	0%	100%	100%	0.0	0.0	0.0	0.0	[illegible]	0
62.5°	142.9	63.9	0%	0%	100%	100%	3.2	3.2	0.0	0.0	57.1	136.1	0%	0%	100%	100%	0.0	0.0	0.0	0.0	252	0
57.5°	79.3	31.8	0%	0%	100%	100%	3.2	3.2	0.0	0.0	30.7	78.2	0%	0%	100%	100%	0.0	0.0	0.0	0.0	152	0
52.5°	37.1	13.8	0%	0%	100%	100%	3.2	3.2	0.0	0.0	14.9	38.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	75	0
47.5°	14.3	4.6	0%	0%	100%	100%	3.2	3.2	0.0	0.0	5.7	15.4	0%	0%	100%	100%	0.0	0.0	0.0	0.0	31	0
42.5°	5.0	1.4	0%	0%	100%	100%	3.2	3.2	0.0	0.0	2.0	5.6	0%	0%	100%	100%	0.0	0.0	0.0	0.0	11	0
37.5°	0.7	0.2	0%	0%	100%	100%	3.2	3.2	0.0	0.0	0.3	0.8	0%	0%	100%	100%	0.0	0.0	0.0	0.0	2	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	5,192	3,031									2,080	4,241									6,907	11,833

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (off)	ConstVol Fan Retrofit (off)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	100%	100%	3.2	3.2	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	76.0	72.8	0%	0%	100%	100%	3.2	3.2	0.0	0.0	3.0	6.3	0%	0%	100%	100%	0.0	0.0	0.0	0.0	10	0
77.5°	308.4	233.2	0%	0%	100%	100%	3.2	3.2	0.0	0.0	32.6	107.8	0%	0%	100%	100%	0.0	0.0	0.0	0.0	240	0
72.5°	390.6	210.8	0%	0%	100%	100%	3.2	3.2	0.0	0.0	51.4	231.2	0%	0%	100%	100%	0.0	0.0	0.0	0.0	575	0
67.5°	213.4	111.0	0%	0%	100%	100%	3.2	3.2	0.0	0.0	21.6	124.0	0%	0%	100%	100%	0.0	0.0	0.0	0.0	327	0
62.5°	131.4	71.2	10%	10%	100%	100%	3.2	3.2	0.1	0.1	14.6	74.8	9%	0%	100%	100%	0.0	0.0	0.0	0.0	192	4
57.5°	98.7	46.1	30%	30%	100%	100%	3.2	3.2	0.2	0.2	10.3	62.9	27%	0%	100%	100%	0.0	0.0	0.1	0.0	168	10
52.5°	66.3	28.4	50%	50%	100%	100%	3.2	3.2	0.3	0.3	5.7	43.6	45%	16%	100%	100%	0.0	0.0	0.2	0.1	121	8
47.5°	37.0	13.5	70%	70%	100%	100%	3.2	3.2	0.4	0.4	2.0	25.5	64%	35%	100%	100%	0.0	0.0	0.3	0.2	75	5
42.5°	12.4	4.2	90%	90%	100%	100%	3.2	3.2	0.5	0.5	0.6	8.8	82%	53%	100%	100%	0.0	0.0	0.4	0.3	26	2
37.5°	4.0	1.0	100%	100%	100%	100%	3.2	3.2	0.5	0.5	0.0	3.0	100%	71%		100%	0.0	0.0	0.5	0.4	10	0
32.5°	2.0	0.5	100%	100%	100%	100%	3.2	3.2	0.5	0.5	0.0	1.5	100%	89%		100%	0.0	0.0	0.5	0.5	5	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0.0	0.0	100%	100%			0.0	0.0	0.5	0.5	0	0
	1,344	797									142	689									1,750	29

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split System - Savings Summary

Facility Public Safety Complex
Unit Location Central Supply

Existing Conditions
Mfg Carrier
Model # 38AKS016
Date Mfg 2008

Baseline Data

Peak kW	
kWh	285,000

Proposed Conditions
Mfg TBD
Model #

Energy Usage

Existing Conditions

00-08 Hrs	24.9	kW	14,203	kWh	0	Therms
09-16 Hrs	24.9	kW	28,799	kWh	0	Therms
17-00 Hrs	24.9	kW	21,632	kWh	0	Therms
Total	**24.9**	**kW**	**64,634**	**kWh**	**0**	**Therms**
	#DIV/0!		*22.7%*			

Proposed Conditions

00-08 Hrs	22.9	kW	13,568	kWh	0	Therms
09-16 Hrs	22.9	kW	26,897	kWh	0	Therms
17-00 Hrs	22.9	kW	20,583	kWh	0	Therms
Total	**22.9**	**kW**	**61,048**	**kWh**	**0**	**Therms**
	#DIV/0!		*21.4%*			

Unadjusted Annual Savings		
	2.0	kW
	3,586	kWh
	0	Therms

Adjusted for BAS	
2.0	**kW**
3004	**kWh**

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Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	Public Safety Complex
Unit Location	Central Supply
Mfg	Carrier
Model #	38AKS016

**RED TEXT IS INPUT

Estimated SF Served by Unit	8704	SF	
Max Cooling Load	261.1	kbtu/hr	400SF/Ton
Max Heating Load	108.8	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	78	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	11,353.0	btu/h-degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	-3626.7	btu/h-degF	
Tbal - Heating	69.8	deg-F	
DX Cooling System	20	tons	
	240	kbtu/hr	
	10.1	New EER/SEER/IPLV	
	1.188	kW/Ton	
	9	Age of Unit (yrs)	
	24.05	Full Load kW(degraded 1% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	9	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	20.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	28.1	0	318.6	225.0	1.000	225.0	24.85	1.00	0
97	23.1	0	261.8	234.4	1.000	234.4	24.85	1.00	0
92	18.1	0	205.0	243.7	1.000	243.7	24.85	0.84	0
87	13.1	54	148.3	253.1	1.000	253.1	24.85	0.59	786
82	8.1	643	91.5	262.4	1.000	262.4	24.85	0.35	5,571
77	3.1	869	34.7	271.8	1.000	271.8	24.85	0.13	2,759
72	-1.9	624	-22.0	281.2	1.000	281.2	24.85	-0.08	-1,218
		2,190							7,901

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	165	-28.3	0.0	1.000	0.0	0.00	-2,416.60	0	-28.36	-8.31	1,371
57	12.8	123	-46.5	0.0	1.000	0.0	0.00	-4,179.86	0	-46.49	-13.62	1,675
52	17.8	80	-64.6	0.0	1.000	0.0	0.00	-6,147.80	0	-64.62	-18.93	1,515
47	22.8	43	-82.7	0.0	1.000	0.0	0.00	-8,358.25	0	-82.76	-24.25	1,043
42	27.8	15	-100.9	0.0	1.000	0.0	0.00	-10,858.99	0	-100.89	-29.56	443
37	32.8	5	-119.0	0.0	1.000	0.0	0.00	-13,711.21	0	-119.02	-34.87	174
32	37.8	2	-137.1	0.0	1.000	0.0	0.00	-16,994.63	0	-137.15	-40.19	80
27	42.8	0	-155.3	0.0	1.000	0.0	0.00	-20,816.01	0	-155.29	-45.50	0
22	47.8	0	-173.4	0.0	1.000	0.0	0.00	-25,315.82	0	-173.42	-50.81	0
17	52.8	0	-191.5	0.0	1.000	0.0	0.00	-30,696.58	0	-191.55	-56.13	0
12	57.8	0	-209.7	0.0	1.000	0.0	0.00	-37,243.34	0	-209.69	-61.44	0
		433							0			6,302

Total Cooling kW Demand	24.9	kW
Total Cooling kWh Consumption	7,901	kWh
Total Heating kWh Consumption	6,302	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	Public Safety Complex
Unit Location	Central Supply
Mfg	Carrier
Model #	38AKS018

**RED TEXT IS INPUT*

Estimated SF Served by Unit	8704	SF	
Max Cooling Load	261.1	kbtu/hr	400SF/Ton
Max Heating Load	348.2	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	11,353.0	btu/h-degF	
Tbal - Cooling	73.9	deg F	
Ktot - Heating	-11605.3	btu/h-degF	
Tbal - Heating	69.9	deg F	
DX Cooling System	20	tons	
	240	kbtu/hr	
	10.1	New EER/SEER/IPLV	
	1.188	kW/Ton	
	9	Age of Unit (yrs)	
	24.85	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	9	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	28	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	318.6	225.0	1.000	225.0	24.85	1.00	0.00	0
97	23.1	5	261.8	234.4	1.000	234.4	24.85	1.00	1.17	124
92	18.1	174	205.0	243.7	1.000	243.7	24.85	0.84	35.67	3,638
87	13.1	787	148.3	253.1	1.000	253.1	24.85	0.59	116.68	11,458
82	8.1	816	91.5	262.4	1.000	262.4	24.85	0.35	74.66	7,070
77	3.1	609	34.7	271.8	1.000	271.8	24.85	0.13	21.15	1,934
72	-1.9	278	-22.0	281.2	1.000	281.2	24.85	-0.08	-8.13	-542
		2,669							243.20	23,682

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.9	70	-92.2	0.0	1.000	0.0	0.00	-7,858.14	-64.52	0	-92.19	-27.01	1,891
57	12.9	34	-150.2	0.0	1.000	0.0	0.00	-13,507.43	-5.11	0	-150.21	-44.01	1,496
52	17.9	17	-208.2	0.0	1.000	0.0	0.00	-19,812.50	-3.54	0	-208.24	-61.01	1,037
47	22.9	5	-266.3	0.0	1.000	0.0	0.00	-26,894.55	-1.33	0	-266.27	-78.02	390
42	27.9	2	-324.3	0.0	1.000	0.0	0.00	-34,906.64	-0.65	0	-324.29	-95.02	190
37	32.9	1	-382.3	0.0	1.000	0.0	0.00	-44,044.85	-0.38	0	-382.32	-112.02	112
32	37.9	0	-440.3	0.0	1.000	0.0	0.00	-54,564.56	0.00	0	-440.34	-129.02	0
27	42.9	0	-498.4	0.0	1.000	0.0	0.00	-66,804.65	0.00	0	-498.37	-146.02	0
22	47.9	0	-556.4	0.0	1.000	0.0	0.00	-81,224.72	0.00	0	-556.40	-163.02	0
17	52.9	0	-614.4	0.0	1.000	0.0	0.00	-98,464.10	0.00	0	-614.42	-180.03	0
12	57.9	0	-672.4	0.0	1.000	0.0	0.00	-119,439.19	0.00	0	-672.45	-197.03	0
		129								0			5,117

Total Cooling kW Demand	24.9	kW
Total Cooling kWh Consumption	23,682	kWh
Total Heating kWh Consumption	5,117	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	Public Safety Complex
Unit Location	Central Supply
Mfg	Carrier
Model #	38AKS018

*RED TEXT IS INPUT

Estimated SF Served by Unit	8704	SF	
Max Cooling Load	261.1	kbtu/hr	400SF/Ton
Max Heating Load	348.2	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	11,353.0	btu/h-degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	-11605.3	btu/h-degF	
Tbal - Heating	69.9	deg-F	
DX Cooling System	20	tons	
	240	kbtu/hr	
	10.1	New EER/SEER/IPLV	
	1.188	kW/Ton	
	9	Age of Unit (yrs)	
	24.85	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	9	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	20	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	318.6	225.0	1.000	225.0	24.85	1.00	0.00	0
97	23.1	1	261.8	234.4	1.000	234.4	24.85	1.00	0.23	25
92	18.1	11	205.0	243.7	1.000	243.7	24.85	0.84	2.26	230
87	13.1	275	148.3	253.1	1.000	253.1	24.85	0.59	40.77	4,004
82	8.1	821	91.5	262.4	1.000	262.4	24.85	0.35	75.11	7,113
77	3.1	862	34.7	271.8	1.000	271.8	24.85	0.13	29.93	2,737
72	-1.9	539	-22.0	281.2	1.000	281.2	24.85	-0.08	-11.88	-1,050
		2,509							136.43	13,059

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.9	106	-92.2	0.0	1.000	0.0	0.00	-7,858.14	-9.77	0	-92.19	-27.01	2,863
57	12.9	60	-150.2	0.0	1.000	0.0	0.00	-13,507.43	-9.01	0	-150.21	-44.01	2,641
52	17.9	31	-208.2	0.0	1.000	0.0	0.00	-19,812.50	-6.46	0	-208.24	-61.01	1,891
47	22.9	10	-266.3	0.0	1.000	0.0	0.00	-26,894.55	-2.66	0	-266.27	-78.02	780
42	27.9	3	-324.3	0.0	1.000	0.0	0.00	-34,906.64	-0.97	0	-324.29	-95.02	285
37	32.9	1	-382.3	0.0	1.000	0.0	0.00	-44,044.85	-0.38	0	-382.32	-112.02	112
32	37.9	0	-440.3	0.0	1.000	0.0	0.00	-54,564.56	0.00	0	-440.34	-129.02	0
27	42.9	0	-498.4	0.0	1.000	0.0	0.00	-66,804.65	0.00	0	-498.37	-146.02	0
22	47.9	0	-556.4	0.0	1.000	0.0	0.00	-81,224.72	0.00	0	-556.40	-163.02	0
17	52.9	0	-614.4	0.0	1.000	0.0	0.00	-98,464.10	0.00	0	-614.42	-180.03	0
12	57.9	0	-672.4	0.0	1.000	0.0	0.00	-119,439.19	0.00	0	-672.45	-197.03	0
		211								0			8,573

Total Cooling kW Demand	24.9	kW
Total Cooling kWh Consumption	13,059	kWh
Total Heating kWh Consumption	8,573	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
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Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility Public Safety Complex
Unit Location Central Supply
Mfg
Model #

**RED TEXT IS INPUT

Estimated SF Served by Unit	8704	SF	
Max Cooling Load	261.1	kbtu/hr	400SF/Ton
Max Heating Load	108.8	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	79	deg F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	11,353.0	btu/h.degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	3628.7	btu/h.degF	
Tbal - Heating	69.8	deg-F	
DX Cooling System	20	tons	
	240	kbtu/hr	
	10.5	New EER/SEER/IPLV	
	1.143	kW/Ton	
	0	Age of Unit (yrs)	
	22.86	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	20	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	11.2	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	318.6	225.0	1.000	225.0	22.86	1.00	0.00	0
97	23.1	0	261.8	234.4	1.000	234.4	22.86	1.00	0.00	0
92	18.1	0	205.0	243.7	1.000	243.7	22.86	0.84	0.00	0
87	13.1	54	148.3	253.1	1.000	253.1	22.86	0.59	8.01	723
82	8.1	643	91.5	262.4	1.000	262.4	22.86	0.35	58.83	5,124
77	3.1	869	34.7	271.8	1.000	271.8	22.86	0.13	30.18	2,538
72	-1.9	624	-22.0	281.2	1.000	281.2	22.86	-0.08	-13.75	-1,118
		2,190							83.26	7,266

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	165	-28.3	0.0	1.000	0.0	0.00	-2,416.60	-4.68	0	-28.36	-8.31	1,371
57	12.8	123	-46.5	0.0	1.000	0.0	0.00	-4,179.86	-5.72	0	-46.49	-13.62	1,675
52	17.8	80	-64.6	0.0	1.000	0.0	0.00	-6,147.80	-5.17	0	-64.62	-18.93	1,515
47	22.8	43	-82.7	0.0	1.000	0.0	0.00	-8,358.25	-3.56	0	-82.76	-24.25	1,043
42	27.8	15	-100.9	0.0	1.000	0.0	0.00	-10,858.99	-1.51	0	-100.89	-29.56	443
37	32.8	5	-119.0	0.0	1.000	0.0	0.00	-13,711.21	-0.60	0	-119.02	-34.87	174
32	37.8	2	-137.1	0.0	1.000	0.0	0.00	-16,994.63	-0.27	0	-137.15	-40.19	80
27	42.8	0	-155.3	0.0	1.000	0.0	0.00	-20,815.01	0.00	0	-155.29	-45.50	0
22	47.8	0	-173.4	0.0	1.000	0.0	0.00	-25,315.82	0.00	0	-173.42	-50.81	0
17	52.8	0	-191.5	0.0	1.000	0.0	0.00	-30,696.58	0.00	0	-191.55	-56.13	0
12	57.8	0	-209.7	0.0	1.000	0.0	0.00	-37,243.34	0.00	0	-209.69	-61.44	0
		433								0			6,302

Total Cooling kW Demand	22.9	kW
Total Cooling kWh Consumption	7,266	kWh
Total Heating kWh Consumption	6,302	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	Public Safety Complex
Unit Location	Central Supply
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	8704	SF	
Max Cooling Load	261.1	kbtu/hr	400SF/Ton
Max Heating Load	348.2	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	11,353.0	btu/h-degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	-11605.3	btu/h-degF	
Tbal - Heating	69.9	deg-F	
DX Cooling System	20	tons	
	240	kbtu/hr	
	10.5	New EER/SEER/IPLV	
	1.143	kW/Ton	
	0	Age of Unit (yrs)	
	22.86	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	20	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	318.6	225.0	1.000	225.0	22.86	1.00	0.00	0
97	23.1	5	261.8	234.4	1.000	234.4	22.86	1.00	1.17	114
92	18.1	174	205.0	243.7	1.000	243.7	22.86	0.84	35.67	3,346
87	13.1	787	148.3	253.1	1.000	253.1	22.86	0.59	116.68	10,538
82	8.1	816	91.5	262.4	1.000	262.4	22.86	0.35	74.66	6,502
77	3.1	609	34.7	271.8	1.000	271.8	22.86	0.13	21.15	1,778
72	-1.9	278	-22.0	281.2	1.000	281.2	22.86	-0.08	-8.13	-498
		2,669							243.20	21,780

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.9	70	-92.2	0.0	1.000	0.0	0.00	-7,858.14	-6.45	0	-92.19	-27.01	1,891
57	12.9	34	-150.2	0.0	1.000	0.0	0.00	-13,507.43	-5.11	0	-150.21	-44.01	1,496
52	17.9	17	-208.2	0.0	1.000	0.0	0.00	-19,812.50	-3.54	0	-208.24	-61.01	1,037
47	22.9	5	-266.3	0.0	1.000	0.0	0.00	-26,894.55	-1.33	0	-266.27	-78.02	390
42	27.9	2	-324.3	0.0	1.000	0.0	0.00	-34,806.64	-0.65	0	-324.29	-95.02	190
37	32.9	1	-382.3	0.0	1.000	0.0	0.00	-44,044.85	-0.38	0	-382.32	-112.02	112
32	37.9	0	-440.3	0.0	1.000	0.0	0.00	-54,564.56	0.00	0	-440.34	-129.02	0
27	42.9	0	-498.4	0.0	1.000	0.0	0.00	-66,804.65	0.00	0	-498.37	-146.02	0
22	47.9	0	-556.4	0.0	1.000	0.0	0.00	-81,224.72	0.00	0	-556.40	-163.02	0
17	52.9	0	-614.4	0.0	1.000	0.0	0.00	-98,464.10	0.00	0	-614.42	-180.03	0
12	57.9	0	-672.4	0.0	1.000	0.0	0.00	-119,439.19	0.00	0	-672.45	-197.03	0
		129								0			5,117

Total Cooling kW Demand	22.9	kW
Total Cooling kWh Consumption	21,780	kWh
Total Heating kWh Consumption	5,117	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	Public Safety Complex
Unit Location	Central Supply
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	8704	SF	
Max Cooling Load	261.1	kbtu/hr	400SF/Ton
Max Heating Load	348.2	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	11,353.0	btu/h-degF	
Tbal - Cooling	73.9	deg F	
Ktot - Heating	-11605.3	btu/h-degF	
Tbal - Heating	69.9	deg F	
DX Cooling System	20	tons	
	240	kbtu/hr	
	10.5	New EER/SEER/IPLV	
	1.143	kW/Ton	
	0	Age of Unit (yrs)	
	22.86	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	20	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.1	0	318.6	225.0	1.000	225.0	22.86	1.00	0.00	0
97	23.1	1	261.8	234.4	1.000	234.4	22.86	1.00	0.23	23
92	18.1	11	205.0	243.7	1.000	243.7	22.86	0.84	2.26	212
87	13.1	275	148.3	253.1	1.000	253.1	22.86	0.59	40.77	3,682
82	8.1	821	91.5	262.4	1.000	262.4	22.86	0.35	75.11	6,542
77	3.1	862	34.7	271.8	1.000	271.8	22.86	0.13	29.93	2,517
72	-1.9	539	-22.0	281.2	1.000	281.2	22.86	-0.08	-11.88	-966
		2,509							136.43	12,010

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.9	106	-92.2	0.0	1.000	0.0	0.00	-7,858.14	-9.77	0	-92.19	-27.01	2,863
57	12.9	60	-150.2	0.0	1.000	0.0	0.00	-13,507.43	-9.01	0	-150.21	-44.01	2,641
52	17.9	31	-208.2	0.0	1.000	0.0	0.00	-19,812.50	-6.46	0	-208.24	-61.01	1,891
47	22.9	10	-266.3	0.0	1.000	0.0	0.00	-26,894.55	-2.66	0	-266.27	-78.02	780
42	27.9	3	-324.3	0.0	1.000	0.0	0.00	-34,906.64	-0.97	0	-324.29	-95.02	285
37	32.9	1	-382.3	0.0	1.000	0.0	0.00	-44,044.85	-0.38	0	-382.32	-112.02	112
32	37.9	0	-440.3	0.0	1.000	0.0	0.00	-54,564.56	0.00	0	-440.34	-129.02	0
27	42.9	0	-498.4	0.0	1.000	0.0	0.00	-66,804.65	0.00	0	-498.37	-146.02	0
22	47.9	0	-556.4	0.0	1.000	0.0	0.00	-81,224.72	0.00	0	-556.40	-163.02	0
17	52.9	0	-614.4	0.0	1.000	0.0	0.00	-98,464.10	0.00	0	-614.42	-180.03	0
12	57.9	0	-672.4	0.0	1.000	0.0	0.00	-119,439.19	0.00	0	-672.45	-197.03	0
		211								0			8,573

Total Cooling kW Demand	22.9	kW
Total Cooling kWh Consumption	12,010	kWh
Total Heating kWh Consumption	8,573	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Public Safety Complex - Central Warehouse
Optimize HVAC Schedules and Set Points

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: CV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 100% — Not applicable to "CV"

Total fan motor hp: 5.0 hp
Motor load factor: 50%
Existing average motor eff: 87.5%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	68 MBtuh	Full load cooling:	15.0 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	0°	Cooling full load at:	97°
Heating zero load at:	70°	Cooling zero load at:	74°
Delta:	70°	Delta:	23°

Annual Cooling Savings: 10,792 kWh
Annual Heating Savings: 1,720 kWh
(No Electric Demand Savings Claimed)

Schedule:
First month of cooling season: 2 February
Last month of cooling season: 11 November
Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:
Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Existing		Proposed	
Unoccupied setback ends:	0	Unoccupied setback ends:	6
Unoccupied setback begins:	24	Unoccupied setback begins:	20
Weekends unoccupied?	Yes (Yes / No)	Weekends unoccupied?	Yes (Yes / No)
Occupied cooling space temperature:	74°	Occupied cooling space temperature:	74°
Cooling setup temperature:	74°	Cooling setup temperature:	80°
Fan mode during unoccupied cooling:	Cycle	Fan mode during unoccupied cooling:	Cycle (**On, Off, Cycle**)
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	70°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	Cycle	Fan mode during unoccupied heating:	Cycle (**On, Off, Cycle**)
Occupied Percent Outside Air:	0%	Occupied Percent Outside Air:	0%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

Baseline Cooling Energy	36,795	kWh	
Baseline Heating Energy	1,816	kWh	(Electric Conversion)
EFLHc	2252.354	Hours	
Utility Baseline	285,120	kWh	
Interior Lighting	30,444	kWh	10.7%
Exterior Lighting	2,847	kWh	1.0%
Misc Equipment	2,037	kWh	0.7%
HVAC	38,612	kWh	13.5%
	73,940		25.9%
Total Savings	12,512	kWh	4.4%

0.1 W/SF

Occupied Cooling

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0
97.5°	2.9	2.9	100%	100%	100%	100%	2.1	2.1	17.1	17.1
92.5°	130.0	126.4	80%	80%	100%	100%	2.1	2.1	13.8	13.8
87.5°	784.3	880.4	59%	59%	100%	100%	2.1	2.1	10.1	10.1
82.5°	1560.0	933.2	37%	37%	100%	100%	2.1	2.1	6.3	6.3
77.5°	1437.1	728.4	15%	15%	100%	100%	2.1	2.1	2.6	2.6
72.5°	721.4	338.0	0%	0%	100%	100%	2.1	2.1	0.0	0.0
67.5°	277.1	125.9	0%	0%	100%	100%	2.1	2.1	0.0	0.0
62.5°	142.9	63.9	0%	0%	100%	100%	2.1	2.1	0.0	0.0
57.5°	79.3	31.8	0%	0%	100%	100%	2.1	2.1	0.0	0.0
52.5°	37.1	13.8	0%	0%	100%	100%	2.1	2.1	0.0	0.0
47.5°	14.3	4.6	0%	0%	100%	100%	2.1	2.1	0.0	0.0
42.5°	5.0	1.4	0%	0%	100%	100%	2.1	2.1	0.0	0.0
37.5°	0.7	0.2	0%	0%	100%	100%	2.1	2.1	0.0	0.0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
	5,192	3,031								

Unoccupied Cooling / Savings

Bin Average (°F)	Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (pk kW)	ConstVol Fan Proposed (pk kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings Fan (kWh)	Savings Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
97.5°	1.1	1.1	100%	81%	100%	100%	2.1	2.1	17.1	13.9	0	4
92.5°	52.0	55.6	80%	60%	100%	100%	2.1	2.1	13.8	10.2	25	198
87.5°	314.7	438.6	59%	38%	100%	100%	2.1	2.1	10.1	6.5	195	1,580
82.5°	625.0	1251.8	37%	15%	100%	100%	2.1	2.1	6.3	2.8	557	4,478
77.5°	574.9	1263.6	15%	0%	100%	100%	2.1	2.1	2.6	0.0	416	3,349
72.5°	200.6	672.0	0%	0%	100%	100%	2.1	2.1	0.0	0.0	0	0
67.5°	112.9	264.1	0%	0%	100%	100%	2.1	2.1	0.0	0.0	0	0
62.5°	57.1	136.1	0%	0%	100%	100%	2.1	2.1	0.0	0.0	0	0
57.5°	30.7	78.2	0%	0%	100%	100%	2.1	2.1	0.0	0.0	0	0
52.5°	14.9	38.3	0%	0%	100%	100%	2.1	2.1	0.0	0.0	0	0
47.5°	5.7	15.4	0%	0%	100%	100%	2.1	2.1	0.0	0.0	0	0
42.5°	2.0	5.6	0%	0%	100%	100%	2.1	2.1	0.0	0.0	0	0
37.5°	0.3	0.8	0%	0%	100%	100%	2.1	2.1	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	2,080	4,241									1,193	9,599

Occupied Heating

Bin Average (°F)	Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0
87.5°	4.0	4.0	0%	0%	100%	100%	2.1	2.1	0.0	0.0
82.5°	76.0	72.8	0%	0%	100%	100%	2.1	2.1	0.0	0.0
77.5°	308.4	233.2	0%	0%	100%	100%	2.1	2.1	0.0	0.0
72.5°	390.6	210.8	0%	0%	100%	100%	2.1	2.1	0.0	0.0
67.5°	213.4	111.0	4%	4%	100%	100%	2.1	2.1	0.0	0.0
62.5°	131.4	71.2	11%	11%	100%	100%	2.1	2.1	0.1	0.1
57.5°	98.7	46.1	18%	18%	100%	100%	2.1	2.1	0.1	0.1
52.5°	66.3	28.4	25%	25%	100%	100%	2.1	2.1	0.2	0.2
47.5°	37.0	13.5	32%	32%	100%	100%	2.1	2.1	0.2	0.2
42.5°	12.4	4.2	39%	39%	100%	100%	2.1	2.1	0.3	0.3
37.5°	4.0	1.0	46%	46%	100%	100%	2.1	2.1	0.3	0.3
32.5°	2.0	0.5	54%	54%	100%	100%	2.1	2.1	0.4	0.4
27.5°	0.0	0.0	61%	61%			0.0	0.0	0.4	0.4
22.5°	0.0	0.0	68%	68%			0.0	0.0	0.5	0.5
17.5°	0.0	0.0	75%	75%			0.0	0.0	0.5	0.5
12.5°	0.0	0.0	82%	82%			0.0	0.0	0.6	0.6
7.5°	0.0	0.0	89%	89%			0.0	0.0	0.6	0.6
2.5°	0.0	0.0	96%	96%			0.0	0.0	0.7	0.7
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7
	1,344	797								

Unoccupied Heating / Savings

Bin Average (°F)	Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (pk kW)	ConstVol Fan Retrofit (pk kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings Fan (kWh)	Savings Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	3.0	6.3	0%	0%	100%	100%	2.1	2.1	0.0	0.0	7	0
77.5°	32.6	107.8	0%	0%	100%	100%	2.1	2.1	0.0	0.0	160	0
72.5°	51.4	231.2	0%	0%	100%	100%	2.1	2.1	0.0	0.0	383	0
67.5°	21.6	124.0	4%	0%	100%	100%	2.1	2.1	0.0	0.0	220	3
62.5°	14.6	74.8	11%	0%	100%	100%	2.1	2.1	0.1	0.0	132	5
57.5°	10.3	62.9	18%	6%	100%	100%	2.1	2.1	0.1	0.0	107	5
52.5°	5.7	43.6	25%	14%	100%	100%	2.1	2.1	0.2	0.1	71	3
47.5°	2.0	25.5	32%	21%	100%	100%	2.1	2.1	0.2	0.1	40	2
42.5°	0.6	8.8	39%	28%	100%	100%	2.1	2.1	0.3	0.2	13	1
37.5°	0.0	3.0	46%	35%		100%	0.0	2.1	0.3	0.2	4	0
32.5°	0.0	1.5	54%	42%		100%	0.0	2.1	0.4	0.3	2	0
27.5°	0.0	0.0	61%	49%			0.0	0.0	0.4	0.3	0	0
22.5°	0.0	0.0	68%	56%			0.0	0.0	0.5	0.4	0	0
17.5°	0.0	0.0	75%	64%			0.0	0.0	0.5	0.4	0	0
12.5°	0.0	0.0	82%	71%			0.0	0.0	0.6	0.5	0	0
7.5°	0.0	0.0	89%	78%			0.0	0.0	0.6	0.5	0	0
2.5°	0.0	0.0	96%	85%			0.0	0.0	0.7	0.6	0	0
-2.5°	0.0	0.0	100%	92%			0.0	0.0	0.7	0.6	0	0
-7.5°	0.0	0.0	100%	99%			0.0	0.0	0.7	0.7	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.7	0.7	0	0
	142	689									1,139	20

Broward County
Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Public Safety Complex - Tactical Training
Optimize HVAC Schedules and Set Points

Assumptions:
1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type:	CV	Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm:	100%	Not applicable to "CV"
Total fan motor hp:	14.0 hp	
Motor load factor:	50%	
Existing average motor eff:	75.0%	
Drive eff:	96%	
VFD eff:	97%	

Load profile characteristics (enter under Equip Summary page):

Full load heating:	82 MBtuh	Full load cooling:	26.5 tons	
Heating efficiency:	100%	Avg. Cooling efficiency:	1.14 kW/ton	(include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	0°	Cooling full load at:	97°	
Heating zero load at:	70°	Cooling zero load at:	74°	
Delta:	70°	Delta:	23°	

Annual Cooling Savings: 28,622 kWh
Annual Heating Savings: 11,862 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Existing		Proposed		
Unoccupied setback ends:	0	Unoccupied setback ends:	6	
Unoccupied setback begins:	24	Unoccupied setback begins:	20	
Weekends unoccupied?	Yes Yes / No	Weekends unoccupied?	Yes Yes / No	
Occupied cooling space temperature:	74°	Occupied cooling space temperature:	74°	
Cooling setup temperature:	74°	Cooling setup temperature:	80°	
Fan mode during unoccupied cooling:	Cycle	Fan mode during unoccupied cooling:	Cycle	**On, Off, Cycle**
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°	
Heating setback temperature:	70°	Heating setback temperature:	60°	
Fan mode during unoccupied heating:	Cycle	Fan mode during unoccupied heating:	Cycle	**On, Off, Cycle**
Occupied Percent Outside Air:	0%	Occupied Percent Outside Air:	0%	
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%	

Baseline Cooling Energy	97,590	kWh	
Baseline Heating Energy	3,883	kWh	(Electric Conversion)
EFLHs	3349.208	Hours	
Utility Baseline	285,120	kWh	
Interior Lighting	94,540	kWh	33.2%
Exterior Lighting	5,168	kWh	1.8%
Misc Equipment	2,808	kWh	1.0%
HVAC	101,274	kWh	35.5%
	203,790		71.5%
Total Savings	40,485	kWh	14.2%

0.1 W/SF

Bin Average (°F)	Occupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Unoccupied Cooling: Cooling Hours Existing	Cooling Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (pk kW)	ConstVol Fan Proposed (pk kW)	Cooling Energy Existing (kW)	Cooling Energy Proposed (kW)	Savings: Fan (kWh)	Savings: Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
97.5°	2.9	2.9	100%	100%	100%	100%	20.9	20.9	30.2	30.2	1.1	1.1	100%	81%	100%	100%	20.9	20.9	30.2	34.6	-4	6
92.5°	130.0	126.4	80%	80%	100%	100%	20.9	20.9	24.3	24.3	52.0	55.6	80%	60%	100%	100%	20.9	20.9	24.3	18.0	242	351
87.5°	784.3	880.4	59%	59%	100%	100%	20.9	20.9	17.7	17.7	314.7	438.6	59%	38%	100%	100%	20.9	20.9	17.7	11.4	1,911	2,768
82.5°	1560.0	933.2	37%	37%	100%	100%	20.9	20.9	11.2	11.2	625.0	1251.6	37%	16%	100%	100%	20.9	20.9	11.2	4.9	5,455	7,699
77.5°	1437.1	728.4	15%	15%	100%	100%	20.9	20.9	4.6	4.6	574.9	1263.6	15%	0%	100%	100%	20.9	20.9	4.6	0.0	4,078	5,906
72.5°	721.4	338.0	0%	0%	100%	100%	20.9	20.9	0.0	0.0	200.6	672.0	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0	0
67.5°	277.1	125.9	0%	0%	100%	100%	20.9	20.9	0.0	0.0	112.9	264.1	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0	0
62.5°	142.9	63.9	0%	0%	100%	100%	20.9	20.9	0.0	0.0	57.1	136.1	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0	0
57.5°	79.3	31.8	0%	0%	100%	100%	20.9	20.9	0.0	0.0	30.7	78.2	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0	0
52.5°	37.1	13.8	0%	0%	100%	100%	20.9	20.9	0.0	0.0	14.9	38.3	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0	0
47.5°	14.3	4.6	0%	0%	100%	100%	20.9	20.9	0.0	0.0	5.7	15.4	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0	0
42.5°	5.0	1.4	0%	0%	100%	100%	20.9	20.9	0.0	0.0	2.0	5.6	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0	0
37.5°	0.7	0.2	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0.3	0.8	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	5,192	3,031									2,080	4,241									11,691	16,931

Bin Average (°F)	Occupied Heating: Heating Hours Existing	Heating Hours Proposed	Load Profile Existing	Load Profile Proposed	ConstVol cfm Existing	ConstVol cfm Proposed	ConstVol Fan Existing (kW)	ConstVol Fan Proposed (kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Unoccupied Heating: Heating Hours (hrs)	Heating Hours (hrs)	Load Profile Existing	Load Profile Retrofit	ConstVol cfm Existing	ConstVol cfm Retrofit	ConstVol Fan Existing (pk kW)	ConstVol Fan Retrofit (pk kW)	Heating Energy Existing (therm/hr)	Heating Energy Proposed (therm/hr)	Savings: Fan (kWh)	Savings: Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	100%	100%	20.9	20.9	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	76.0	72.8	0%	0%	100%	100%	20.9	20.9	0.0	0.0	3.0	6.3	0%	0%	100%	100%	20.9	20.9	0.0	0.0	68	0
77.5°	308.4	233.2	0%	0%	100%	100%	20.9	20.9	0.0	0.0	32.6	107.8	0%	0%	100%	100%	20.9	20.9	0.0	0.0	1570	0
72.5°	390.6	210.8	0%	0%	100%	100%	20.9	20.9	0.0	0.0	51.4	231.2	0%	0%	100%	100%	20.9	20.9	0.0	0.0	3754	0
67.5°	213.4	111.0	4%	4%	100%	100%	20.9	20.9	0.0	0.0	21.6	124.0	4%	0%	100%	100%	20.9	20.9	0.0	0.0	2155	4
62.5°	131.4	71.2	11%	11%	100%	100%	20.9	20.9	0.1	0.1	14.6	74.8	11%	0%	100%	100%	20.9	20.9	0.1	0.0	1290	7
57.5°	98.7	46.1	18%	18%	100%	100%	20.9	20.9	0.1	0.1	10.3	62.9	18%	6%	100%	100%	20.9	20.9	0.1	0.1	1052	6
52.5°	66.3	28.4	25%	25%	100%	100%	20.9	20.9	0.2	0.2	5.7	43.6	25%	14%	100%	100%	20.9	20.9	0.2	0.1	697	4
47.5°	37.0	13.5	32%	32%	100%	100%	20.9	20.9	0.3	0.3	2.0	25.5	32%	21%	100%	100%	20.9	20.9	0.3	0.2	394	2
42.5°	12.4	4.2	39%	39%	100%	100%	20.9	20.9	0.3	0.3	0.6	8.8	39%	28%	100%	100%	20.9	20.9	0.3	0.2	125	1
37.5°	4.0	1.0	46%	46%	100%	100%	20.9	20.9	0.4	0.4	0.0	3.0	46%	35%		100%	0.0	20.9	0.4	0.3	41	0
32.5°	2.0	0.5	54%	54%	100%	100%	20.9	20.9	0.4	0.4	0.0	1.5	54%	42%		100%	0.0	20.9	0.4	0.3	18	0
27.5°	0.0	0.0	61%	61%			0.0	0.0	0.5	0.5	0.0	0.0	61%	49%			0.0	0.0	0.5	0.4	0	0
22.5°	0.0	0.0	68%	68%			0.0	0.0	0.6	0.6	0.0	0.0	68%	56%			0.0	0.0	0.6	0.5	0	0
17.5°	0.0	0.0	75%	75%			0.0	0.0	0.6	0.6	0.0	0.0	75%	64%			0.0	0.0	0.6	0.5	0	0
12.5°	0.0	0.0	82%	82%			0.0	0.0	0.7	0.7	0.0	0.0	82%	71%			0.0	0.0	0.7	0.6	0	0
7.5°	0.0	0.0	89%	89%			0.0	0.0	0.7	0.7	0.0	0.0	89%	78%			0.0	0.0	0.7	0.6	0	0
2.5°	0.0	0.0	96%	96%			0.0	0.0	0.8	0.8	0.0	0.0	96%	85%			0.0	0.0	0.8	0.7	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	0.8	0.8	0.0	0.0	100%	92%			0.0	0.0	0.8	0.8	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	0.8	0.8	0.0	0.0	100%	99%			0.0	0.0	0.8	0.8	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	0.8	0.8	0.0	0.0	100%	100%			0.0	0.0	0.8	0.8	0	0
	1,344	797									142	689									11,165	24

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Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Public Safety Complex - BSO District 5 Office
Optimize HVAC Schedules and Set Points

Assumptions:

1) 20% hp minimum with VFDs
2) Setup load simulated by reduction of OA temp equal to setup differential. Setup load = MIN((OAT - Lag*(Setup T - Space T)-Cooling zero load T),0) / (Cooling full load T - Cooling zero load T)
3) Setback load simulated by reduction of OA temp equal to setback differential. Setback load = MIN((Heating load zero T - OAT - Lag*(Space T - Setback T)),0) / (Heating zero load T - Heating full load T)
4) Only recognizes "off" fan savings for CV fans

Basis:

Fan operation type: CV — Constant Volume: **CV**, VFD: **VFD**, Inlet Vane: **IV**, Discharge Damper: **DD**
VAV min cfm: 100% — Not applicable to "CV"

Total fan motor hp: 27.0 hp
Motor load factor: 50%
Existing average motor eff: 57.3%
Drive eff: 96%
VFD eff: 97%

Load profile characteristics (enter under Equip Summary page):

Full load heating:	253 MBtu/hr	Full load cooling:	89.3 tons
Heating efficiency:	100%	Avg. Cooling efficiency:	1.05 kW/ton (include pumps & cooling tower fans in kW/ton if applicable)
Heating full load at:	40°	Cooling full load at:	92°
Heating zero load at:	70°	Cooling zero load at:	70°
Delta:	30°	Delta:	22°

Annual Cooling Savings: 82,259 kWh
Annual Heating Savings: 14,063 kWh
(No Electric Demand Savings Claimed)

Schedule:

First month of cooling season: 2 February
Last month of cooling season: 11 November

Weather data: Fort Lauderdale Temperature Bins

Load Adjustments:

Setpoint adjustment moderator: 0.8 — Dampens ΔT changes in setpoints. (If <1, reduces load change.)

Existing		*Proposed*	
Unoccupied setback ends:	0	Unoccupied setback ends:	6
Unoccupied setback begins:	24	Unoccupied setback begins:	20
Weekends unoccupied?	Yes (Yes / No)	Weekends unoccupied?	Yes (Yes / No)
Occupied cooling space temperature:	72°	Occupied cooling space temperature:	72°
Cooling setup temperature:	73°	Cooling setup temperature:	78°
Fan mode during unoccupied cooling:	cycle	Fan mode during unoccupied cooling:	cycle (**On, Off, Cycle**)
Occupied heating space temperature:	70°	Occupied heating space temperature:	70°
Heating setback temperature:	70°	Heating setback temperature:	60°
Fan mode during unoccupied heating:	cycle	Fan mode during unoccupied heating:	cycle (**On, Off, Cycle**)
Occupied Percent Outside Air:	0%	Occupied Percent Outside Air:	0%
Unoccupied Percent Outside Air:	0%	Unoccupied Percent Outside Air:	0%

Baseline Cooling Energy: 346,889 kWh
Baseline Heating Energy: 17,459 kWh (Electric Conversion)

EFLHs: 3865.516 Hours

Utility Baseline: 660,280 kWh

Interior Lighting	134,432	kWh	20.4%
Exterior Lighting	28,500	kWh	4.3%
Misc Equipment	63,180	kWh	9.6%
HVAC	364,148	kWh	55.3%
	590,260		89.7%

1 WMF

Total Savings: 96,323 kWh 14.6%

Bin Average (°F)	Occupied Cooling – Cooling Hours Existing	Occupied Cooling – Cooling Hours Proposed	Occupied Cooling – Load Profile Existing	Occupied Cooling – Load Profile Proposed	Occupied Cooling – ConstVol cfm Existing	Occupied Cooling – ConstVol cfm Proposed	Occupied Cooling – ConstVol Fan Existing (kW)	Occupied Cooling – ConstVol Fan Proposed (kW)	Occupied Cooling – Cooling Energy Existing (kW)	Occupied Cooling – Cooling Energy Proposed (kW)	Unoccupied Cooling – Cooling Hours Existing	Unoccupied Cooling – Cooling Hours Proposed	Unoccupied Cooling – Load Profile Existing	Unoccupied Cooling – Load Profile Proposed	Unoccupied Cooling – ConstVol cfm Existing	Unoccupied Cooling – ConstVol cfm Proposed	Unoccupied Cooling – ConstVol Fan Existing (pk kW)	Unoccupied Cooling – ConstVol Fan Proposed (pk kW)	Unoccupied Cooling – Cooling Energy Existing (kW)	Unoccupied Cooling – Cooling Energy Proposed (kW)	Savings – Fan (kWh)	Savings – Cooling (kWh)
107.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0.0	0.0	100%	100%			0.0	0.0	0.0	0.0	0	0
97.5°	2.9	2.9	100%	100%	100%	100%	17.6	17.6	94.2	94.2	1.1	1.1	100%	100%	100%	100%	17.6	17.6	94.2	94.2	0	0
92.5°	130.0	126.4	100%	100%	100%	100%	17.6	17.6	94.2	94.2	52.0	56.6	100%	80%	100%	100%	17.6	17.6	94.2	75.8	191	1,023
87.5°	784.3	880.4	80%	80%	100%	100%	17.6	17.6	74.9	74.9	314.7	438.6	80%	58%	100%	100%	17.6	17.6	74.9	54.4	1,682	9,013
82.5°	1560.0	933.2	57%	57%	100%	100%	17.6	17.6	53.5	53.6	625.0	1251.8	57%	35%	100%	100%	17.6	17.6	53.5	33.0	4,799	25,722
77.5°	1437.1	728.4	34%	34%	100%	100%	17.6	17.6	32.1	32.1	574.9	1283.6	34%	12%	100%	100%	17.6	17.6	32.1	11.6	4,921	26,376
72.5°	721.4	388.0	11%	11%	100%	100%	17.6	17.6	10.7	10.7	200.6	672.0	11%	0%	100%	100%	17.6	17.6	10.7	0.0	1,342	7,192
67.5°	277.1	135.9	0%	0%	100%	100%	17.6	17.6	0.0	0.0	112.9	264.1	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0	0
62.5°	142.9	63.9	0%	0%	100%	100%	17.6	17.6	0.0	0.0	57.1	136.1	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0	0
57.5°	79.3	31.8	0%	0%	100%	100%	17.6	17.6	0.0	0.0	30.7	78.2	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0	0
52.5°	37.1	13.8	0%	0%	100%	100%	17.6	17.6	0.0	0.0	14.9	38.3	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0	0
47.5°	14.3	4.6	0%	0%	100%	100%	17.6	17.6	0.0	0.0	5.7	15.4	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0	0
42.5°	5.0	1.4	0%	0%	100%	100%	17.6	17.6	0.0	0.0	2.0	5.6	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0	0
37.5°	0.7	0.2	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0.3	0.8	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0	0
32.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
27.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
22.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
17.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-2.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-7.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
-12.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
	5,192	3,031									2,080	4,241									12,933	69,326

Bin Average (°F)	Occupied Heating – Heating Hours Existing	Occupied Heating – Heating Hours Proposed	Occupied Heating – Load Profile Existing	Occupied Heating – Load Profile Proposed	Occupied Heating – ConstVol cfm Existing	Occupied Heating – ConstVol cfm Proposed	Occupied Heating – ConstVol Fan Existing (kW)	Occupied Heating – ConstVol Fan Proposed (kW)	Occupied Heating – Heating Energy Existing (therm/hr)	Occupied Heating – Heating Energy Proposed (therm/hr)	Unoccupied Heating – Heating Hours (hrs)	Unoccupied Heating – Heating Hours (hrs)	Unoccupied Heating – Load Profile Existing	Unoccupied Heating – Load Profile Retrofit	Unoccupied Heating – ConstVol cfm Existing	Unoccupied Heating – ConstVol cfm Retrofit	Unoccupied Heating – ConstVol Fan Existing (pk kW)	Unoccupied Heating – ConstVol Fan Retrofit (pk kW)	Unoccupied Heating – Heating Energy Existing (therm/hr)	Unoccupied Heating – Heating Energy Proposed (therm/hr)	Savings – Fan (kWh)	Savings – Heating (therm)
107.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
102.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
97.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
92.5°	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
87.5°	4.0	4.0	0%	0%	100%	100%	17.6	17.6	0.0	0.0	0.0	0.0	0%	0%			0.0	0.0	0.0	0.0	0	0
82.5°	76.0	72.8	0%	0%	100%	100%	17.6	17.6	0.0	0.0	3.0	6.3	0%	0%	100%	100%	17.6	17.6	0.0	0.0	57	0
77.5°	308.4	233.2	0%	0%	100%	100%	17.6	17.6	0.0	0.0	32.6	107.8	0%	0%	100%	100%	17.6	17.6	0.0	0.0	1322	0
72.5°	390.6	210.8	0%	0%	100%	100%	17.6	17.6	0.0	0.0	51.4	231.2	0%	0%	100%	100%	17.6	17.6	0.0	0.0	3169	0
67.5°	213.4	111.0	8%	8%	100%	100%	17.6	17.6	0.2	0.2	21.6	124.0	8%	0%	100%	100%	17.6	17.6	0.2	0.0	1832	26
62.5°	131.4	71.2	25%	25%	100%	100%	17.6	17.6	0.6	0.6	14.6	74.8	25%	0%	100%	100%	17.6	17.6	0.6	0.0	1122	47
57.5°	98.7	46.1	42%	42%	100%	100%	17.6	17.6	1.1	1.1	10.3	62.9	42%	15%	100%	100%	17.6	17.6	1.1	0.4	834	42
52.5°	66.3	28.4	58%	58%	100%	100%	17.6	17.6	1.5	1.5	5.7	43.6	58%	32%	100%	100%	17.6	17.6	1.5	0.8	482	29
47.5°	37.0	13.5	75%	75%	100%	100%	17.6	17.6	1.9	1.9	2.0	25.5	75%	48%	100%	100%	17.6	17.6	1.9	1.2	223	17
42.5°	12.4	4.2	92%	92%	100%	100%	17.6	17.6	2.3	2.3	0.6	8.8	92%	65%	100%	100%	17.6	17.6	2.3	1.6	53	6
37.5°	4.0	1.0	100%	100%	100%	100%	17.6	17.6	2.5	2.5	0.0	3.0	100%	82%		100%	0.0	17.6	2.5	2.1	10	1
32.5°	2.0	0.5	100%	100%	100%	100%	17.6	17.6	2.5	2.5	0.0	1.5	100%	98%		100%	0.0	17.6	2.5	2.5	0	0
27.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
22.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
17.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
12.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
7.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
2.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
-2.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
-7.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
-12.5°	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0.0	0.0	100%	100%			0.0	0.0	2.5	2.5	0	0
	1,344	797									142	689									9,093	170

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

North Regional Courthouse - New Chiller Savings

MONTHLY ENERGY CONSUMPTION

By Opterra Energy

------- Monthly Energy Consumption -------

Utility		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Alternative: 1	**Baseline - Existing Chillers**													
Electric														
	On-Pk Cons. (kWh)	22,825	21,712	29,709	33,811	36,461	50,789	55,416	57,046	51,253	37,885	32,326	26,601	455,832
	On-Pk Demand (kW)	260	95	102	123	115	182	192	187	188	137	124	107	260
Water														
	Cons. (1000gal)	70	71	107	119	123	180	188	200	179	137	112	89	1,575

Energy Consumption			Environmental Impact Analysis	
Building	12,884	Btu/(ft2-year)	CO2	573,136 lbm/year
Source	38,656	Btu/(ft2-year)	SO2	1,626 gm/year
			NOX	920 gm/year
Floor Area	120,750	ft2		

Utility		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Alternative: 2	**New Chiller**													
Electric														
	On-Pk Cons. (kWh)	21,487	20,264	27,074	30,580	33,298	43,391	47,230	48,357	43,467	33,787	29,468	24,605	403,008
	On-Pk Demand (kW)	259	82	87	102	97	148	167	152	164	112	102	90	259
Water														
	Cons. (1000gal)	68	69	103	114	119	173	182	193	173	132	109	86	1,521

Energy Consumption			Environmental Impact Analysis	
Building	11,391	Btu/(ft2-year)	CO2	506,718 lbm/year
Source	34,176	Btu/(ft2-year)	SO2	1,438 gm/year
			NOX	813 gm/year
Floor Area	120,750	ft2		

Utility		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Alternative: 3	**New Chiller w/VSD**													
Electric														
	On-Pk Cons. (kWh)	19,188	17,936	25,180	29,124	31,832	42,322	46,544	47,872	42,653	32,455	27,687	22,648	385,442
	On-Pk Demand (kW)	252	73	81	96	92	145	163	152	161	107	96	83	252
Water														
	Cons. (1000gal)	65	67	102	113	118	172	181	192	172	131	107	84	1,505

Energy Consumption			Environmental Impact Analysis	
Building	10,895	Btu/(ft2-year)	CO2	484,631 lbm/year
Source	32,687	Btu/(ft2-year)	SO2	1,375 gm/year
			NOX	778 gm/year
Floor Area	120,750	ft2		

Project Name: Broward Co - NRCH Chiller Replacement
Dataset Name: NRCH.TCE

TRACE® 700 v6.3 calculated at 09:25 PM on 12/14/2017
Alternative - 3 Monthly Energy Consumption report Page 2 of 2

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Energy Savings Performance Contract
Whole Building Energy Model

North Regional Courthouse

MODEL CALIBRATION	Electric kWh	Nat. Gas Therm
Baseline	2,481,830	0
eQUEST Model	2,454,400	0
Error	1.3%	#DIV/0!

BASELINE MODEL

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

ECM - Lighting Savings

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Savings Percent of Baseline
[illegible]
#DIV/0!
[illegible]
Avg Monthly KW Savings

ECM - Optimize HVAC Sch (Existing)

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Savings Percent of Baseline
[illegible]
#DIV/0!
[illegible]
Avg Monthly KW Savings

ECM - Energy Eff Upgrades (Adding Other AHUs to EMS)

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Savings Percent of Baseline
[illegible]
#DIV/0!
[illegible]
Avg Monthly KW Savings

ECM - Variable Flow CHW Piping

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Savings Percent of Baseline
[illegible]
#DIV/0!
[illegible]
Avg Monthly KW Savings

ECM - CHW Pump Replacement

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Savings Percent of Baseline
[illegible]
#DIV/0!
[illegible]
Avg Monthly KW Savings

ECM - New Chiller

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM													
MAX THERM/HR													
DAY/HR													
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Savings Percent of Baseline
[illegible]
#DIV/0!
[illegible]
Avg Monthly KW Savings

ECM - New VSD Chiller Option

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM													
MAX THERM/HR													
DAY/HR													
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Savings Percent of Baseline
[illegible]
#DIV/0!
[illegible]
Avg Monthly KW Savings

ECM - New AHUs

BM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAX KW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DAY/HR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BM1 NATURAL-GAS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
THERM													
MAX THERM/HR													
DAY/HR													
SAVINGS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANN**
KWH SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
KW SAVINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Savings Percent of Baseline
[illegible]
#DIV/0!
[illegible]
Avg Monthly KW Savings

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Energy Savings Performance Contract
Whole Building Energy Model

Government Center West

MODEL CALIBRATION	Electric kWh	Nat. Gas Therms
Baseline	3,467,760	0
eQUEST Model	3,238,489	0
Error	-6.6%	#DIV/0!

BASELINE MODEL

BLOCK-C	HARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
On-Peak	Consumption													
	USE:	TIME-OF-	USE											
	METERED ENERGY:	77450	77860	87989	110205	100012	120006	117576	128129	121533	100841	78234	83327	
	BILLING ENERGY:	77450	77860	87989	110205	100012	120006	117576	128129	121533	106841	78234	83327	1209162
	METERED DEMAND:	798.1	813.6	686.5	698.4	742.2	794.3	788.8	779.5	803.3	745.4	730.9	721.7	
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
	ENERGY CHGS($):	5260	5287	5975	7484	6792	8150	7985	8701	8253	7256	5313	5659	82114
Off-Pea	k Consumption													
	USE:	TIME-OF-	USE											
	METERED ENERGY:	183137	172483	170382	145040	149031	166173	178513	188886	172088	160190	169157	174247	
	BILLING ENERGY:	183137	172483	170382	145040	149031	166173	178513	188886	172088	160190	169157	174247	2029327
	METERED DEMAND:	798.6	807.7	701.4	685.2	693.1	758.6	768.7	753	758.1	731.6	734.1	721.2	
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
	ENERGY CHGS($):	8498	8003	7906	6730	6915	7710	8283	8764	7985	7433	7849	8085	94161
On-Peak	Demand													
	USE:	TIME-OF-	USE											
	METERED ENERGY:	77450	77860	87989	110205	100012	120006	117576	128129	121533	106841	78234	83327	
	BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1209162
	METERED DEMAND:	798.1	813.6	686.5	698.4	742.2	794.3	788.8	779.5	803.3	745.4	730.9	721.7	
	BILLING DEMAND:	798.1	813.6	686.5	698.4	742.2	794.3	788.8	779.5	803.3	745.4	730.9	721.7	
	DEMAND CHGS($):	10734	10943	9234	9394	9982	10683	10610	10484	10805	10026	9830	9706	122431
		=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======
	TOTAL ENERGY:	260587	250343	258371	255246	249043	286180	296089	317015	293621	267031	247390	257574	3238489
	TOTAL CHARGES ($):	24491	24234	23115	23608	23689	26543	26877	27949	27043	24714	22992	23450	298706

ECM L-1: Lighting Upgrades

BLOCK-C	HARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
On-Peak	Consumption													
	USE:	TIME-OF-	USE											
	METERED ENERGY:	73084	72948	79687	96682	86469	104475	102971	113344	107158	93571	69783	78198	
	BILLING ENERGY:	73084	72948	79687	96682	86469	104475	102971	113344	107158	93571	69783	78198	1078369
	METERED DEMAND:	728.1	750.9	630.2	616.5	652.5	701.2	703.5	691	713.4	656.6	635.2	734.4	
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
	ENERGY CHGS($):	4963	4954	5412	6566	5872	7095	6993	7697	7277	6354	4739	5310	73232
Off-Pea	k Consumption													
	USE:	TIME-OF-	USE											
	METERED ENERGY:	180573	165766	153744	132288	134831	148343	162202	172637	156042	145663	152346	171945	
	BILLING ENERGY:	180573	165766	153744	132288	134831	148343	162202	172637	156042	145663	152346	171945	1876380
	METERED DEMAND:	734.4	755.2	620.5	629	610.3	663.8	673.5	667	672.1	641.1	641.4	694	
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0	
	ENERGY CHGS($):	8379	7692	7134	6138	6256	6883	7526	8010	7240	6759	7069	7978	87064
On-Peak	Demand													
	USE:	TIME-OF-	USE											
	METERED ENERGY:	73084	72948	79687	96682	86469	104475	102971	113344	107158	93571	69783	78198	
	BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1078369
	METERED DEMAND:	728.1	750.9	630.2	616.5	652.5	701.2	703.5	691	713.4	656.6	635.2	734.4	
	BILLING DEMAND:	728.1	750.9	630.2	616.5	652.5	701.2	703.5	691	713.4	656.6	635.2	734.4	
	DEMAND CHGS($):	9792	10099	8476	8292	8776	9431	9462	9295	9595	8832	8544	9878	110472
		=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======
	TOTAL ENERGY:	253657	238714	233431	228969	221300	252818	265174	285981	263199	239234	222128	250143	2954749
	TOTAL CHARGES ($):	23134	22745	21021	20996	20904	23409	23981	25002	24112	21945	20352	23167	270768

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline:
On-Peak kWh Savings	4,366	4,912	8,302	13,523	13,543	15,531	14,605	14,785	14,375	13,270	8,451	5,129	130,792	3.8%
Off-Peak kWh Savings	2,564	6,717	16,638	12,752	14,200	17,830	16,311	16,249	16,046	14,527	16,811	2,302	152,947	4.4%
kW Savings	70.00	62.70	56.30	81.90	89.70	93.10	85.30	88.50	89.90	88.80	95.70	-12.70	889	

OPTERRA
An ENGIE company

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM C-11: Optimize Schedules and Setpoints

BLOCK-C	HARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
On-Peak	Consumption														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	70702	72779	74051	93291	82489	103572	101839	114512	105920	90016	62092	74467		
	BILLING ENERGY:	70702	72779	74051	93291	82489	103572	101839	114512	105920	90016	62092	74467	1045730	
	METERED DEMAND:	762.9	755.1	650.8	615.5	651.9	698.1	711	691.1	707.7	653.1	636.6	733.8		
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0		
	ENERGY CHGS($):	4801	4942	5029	6335	5602	7034	6916	7777	7193	6113	4217	5057	71015	
Off-Pea	k Consumption														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	165197	154287	143910	120656	124689	139176	154278	165223	146882	132173	142135	155815		
	BILLING ENERGY:	165197	154287	143910	120656	124689	139176	154278	165223	146882	132173	142135	155815	1744423	
	METERED DEMAND:	734.5	752.3	622.1	616.9	605.3	667.3	678.3	675	668.1	640.5	640.6	683.3		
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0		
	ENERGY CHGS($):	7665	7159	6677	5598	5786	6458	7158	7666	6815	6133	6595	7230	80941	
On-Peak	Demand														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	70702	72779	74051	93291	82489	103572	101839	114512	105920	90016	62092	74467		
	BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1045730	
	METERED DEMAND:	762.9	755.1	650.8	615.5	651.9	698.1	711	691.1	707.7	653.1	636.6	733.8		
	BILLING DEMAND:	762.9	755.1	650.8	615.5	651.9	698.1	711	691.1	707.7	653.1	636.6	733.8		
	DEMAND CHGS($):	10360	10155	8754	8278	8767	9389	9563	9296	9518	8784	8562	9869	111197	
	TOTAL ENERGY:	235899	227066	217961	213947	207178	242748	256117	279736	252803	222189	204227	230282	2790152	
	TOTAL CHARGES ($):	22727	22257	20460	20212	20155	22880	23638	24738	23527	21030	19374	22156	263153	
	SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline
	On-Peak kWh Savings	2,382	169	5,636	3,391	3,900	903	1,132	1,168	1,298	3,555	7,691	3,731	32,640	0.9%
	Off-Peak kWh Savings	15,376	11,479	9,834	11,632	10,142	9,167	7,924	7,414	9,160	13,490	10,211	16,130	131,959	3.0%
	kW Savings	-34.80	-4.20	-20.60	1.00	0.60	3.10	-7.50	-0.10	5.70	3.50	-1.40	0.60	-54	

ECM C-3: BAS System Check Ou;

BLOCK-C	HARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
On-Peak	Consumption														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	69482	72392	73781	92411	82044	102695	101668	113762	105614	89498	62313	72819		
	BILLING ENERGY:	69482	72392	73781	92411	82044	102695	101668	113762	105614	89498	62313	72819	1038478	
	METERED DEMAND:	764	753.9	644.9	606.2	642	686.9	698.3	679.8	704.5	642.6	626.1	719.2		
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0		
	ENERGY CHGS($):	4719	4916	5010	6276	5572	6974	6904	7726	7172	6078	4232	4945	70523	
Off-Pea	k Consumption														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	162841	153287	141967	119358	124331	139107	153714	164778	146684	131405	141383	153293		
	BILLING ENERGY:	162841	153287	141967	119358	124331	139107	153714	164778	146684	131405	141383	153293	1732148	
	METERED DEMAND:	733.7	754	616	636.8	597	655	685	665.3	656.3	630.1	632	676.1		
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0		
	ENERGY CHGS($):	7556	7113	6587	5538	5769	6455	7132	7646	6806	6097	6560	7113	80372	
On-Peak	Demand														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	69482	72392	73781	92411	82044	102695	101668	113762	105614	89498	62313	72819		
	BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1038478	
	METERED DEMAND:	764	753.9	644.9	606.2	642	686.9	698.3	679.8	704.5	642.6	626.1	719.2		
	BILLING DEMAND:	764	753.9	644.9	606.2	642	686.9	698.3	679.8	704.5	642.6	626.1	719.2		
	DEMAND CHGS($):	10275	10140	8674	8154	8635	9239	9393	9143	9475	8642	8421	9674	109865	
	TOTAL ENERGY:	232323	225680	215748	211769	206374	241803	255382	278540	252297	220903	203696	226111	2770626	
	TOTAL CHARGES ($):	22550	22169	20271	19967	19976	22667	23429	24514	23453	20817	19213	21731	260760	
	SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline
	On-Peak kWh Savings	1,220	387	270	880	445	877	171	750	306	518	-221	1,648	7,251	0.2%
	Off-Peak kWh Savings	2,356	1,000	1,343	1,298	358	69	564	445	198	768	752	2,522	12,279	0.4%
	kW Savings	1.10	1.20	5.90	9.30	9.90	11.20	12.70	11.30	3.20	10.50	10.50	14.60	99	

ECM C-7: Variable Flow CHW Pumping

BLOCK-C	HARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
On-Peak	Consumption														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	67311	70474	70949	88279	78692	99046	98167	109971	102136	86096	59874	70778		
	BILLING ENERGY:	67311	70474	70949	88279	78692	99046	98167	109971	102136	86096	59874	70778	1001773	
	METERED DEMAND:	729.9	730.4	606.4	586.4	623.5	669.4	680.6	662	695	624.3	607.7	687.1		
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0		
	ENERGY CHGS($):	4571	4786	4818	5995	5344	6726	6667	7468	6936	5847	4066	4807	68030	
Off-Pea	k Consumption														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	154515	146202	135741	113655	117658	132042	145617	155100	139221	125163	135479	145904		
	BILLING ENERGY:	154515	146202	135741	113655	117658	132042	145617	155100	139221	125163	135479	145904	1646296	
	METERED DEMAND:	708.9	730.4	595.8	588.6	577.7	637	647.1	647.3	638.6	611.8	613.5	651.4		
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0		
	ENERGY CHGS($):	7170	6784	6298	5274	5459	6127	6757	7197	6460	5808	6286	6770	76389	
On-Peak	Demand														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	67311	70474	70949	88279	78692	99046	98167	109971	102136	86096	59874	70778		
	BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	1001773	
	METERED DEMAND:	729.9	730.4	606.4	586.4	623.5	669.4	680.6	662	695	624.3	607.7	687.1		
	BILLING DEMAND:	729.9	730.4	606.4	586.4	623.5	669.4	680.6	662	695	624.3	607.7	687.1		
	DEMAND CHGS($):	9817	9824	8156	7888	8386	9003	9154	8904	9348	8397	8174	9241	106292	
	TOTAL ENERGY:	221827	216676	206689	201934	196350	231088	243784	265070	241357	211259	195353	216682	2648069	
	TOTAL CHARGES ($):	21558	21394	19273	19156	19189	21856	22577	23568	22744	20051	18526	20817	250711	
	SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline
	On-Peak kWh Savings	2,171	1,910	2,832	4,132	3,352	3,649	3,501	5,791	5,478	3,402	2,439	2,041	36,706	1.1%
	Off-Peak kWh Savings	8,326	7,085	6,226	5,703	6,673	7,065	8,097	9,678	7,463	6,342	5,904	7,389	85,851	2.5%
	KW Savings	34.10	23.50	38.50	19.00	18.50	17.50	17.70	17.90	9.50	18.30	10.40	32.10	266	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

ECM M-8: AHU Replacements

BLOCK-C	HARGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
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On-Peak	Consumption														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	67783	69871	72338	86600	76895	96416	95622	106900	99779	84054	59196	71021		
	BILLING ENERGY:	67783	69871	72338	86600	76895	96416	95622	106900	99779	84054	59196	71021	986475	
	METERED DEMAND:	696.8	709.3	610.7	572.5	608.9	647.6	657.4	642	687	610.3	591.8	661.7		
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0		
	ENERGY CHGS($):	4603	4745	4912	5881	5222	6548	6494	7260	6776	5708	4020	4823	66991	
Off-Pea	k Consumption														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	153249	144447	134754	113605	114690	127478	142250	153843	134800	124349	132463	146762		
	BILLING ENERGY:	153249	144447	134754	113605	114690	127478	142250	153843	134800	124349	132463	146762	1622690	
	METERED DEMAND:	664.9	720.9	580.3	608.3	568.6	620.4	635.6	627.4	625.7	598.1	595.2	626.8		
	BILLING DEMAND:	0	0	0	0	0	0	0	0	0	0	0	0		
	ENERGY CHGS($):	7111	6702	6253	5271	5322	5915	6600	7138	6255	5770	6146	6810	75293	
On-Peak	Demand														
	USE:	TIME-OF-	USE												
	METERED ENERGY:	67783	69871	72338	86600	76895	96416	95622	106900	99779	84054	59196	71021		
	BILLING ENERGY:	0	0	0	0	0	0	0	0	0	0	0	0	986475	
	METERED DEMAND:	696.8	709.3	610.7	572.5	608.9	647.6	657.4	642	687	610.3	591.8	661.7		
	BILLING DEMAND:	696.8	709.3	610.7	572.5	608.9	647.6	657.4	642	687	610.3	591.8	661.7		
	DEMAND CHGS($):	9371	9541	8214	7701	8189	8710	8841	8636	9240	8209	7959	8900	103510	
		=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	
	TOTAL ENERGY:	221031	214318	207093	200204	191586	223895	237872	260743	234579	208403	191659	217783	2609165	
	TOTAL CHARGES ($):	21085	20988	19379	18853	18733	21172	21935	23033	22271	19687	18126	20633	245794	
	SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline
	On-Peak kWh Savings	-472	603	-1,309	1,679	1,797	2,630	2,545	3,071	2,357	2,042	670	-243	15,298	0.4%
	Off-Peak kWh Savings	1,266	1,755	907	50	2,968	4,564	3,367	1,257	4,421	814	3,016	-858	23,607	0.7%
	kW Savings	33.10	21.10	-4.30	13.90	14.60	21.80	23.20	20.00	8.00	14.00	15.90	25.40	207	

RTU - Savings Summary

Facility Family Success Center
Unit Location RTUs

Existing Conditions
Mfg Various
Model # Various
Date Mfg Various

Proposed Conditions
Mfg TBD
Model # TBD

Energy Usage

Existing Conditions

00-08 Hrs	32.1	kW	10,682	kWh	0	Therms
09-16 Hrs	32.1	kW	22,042	kWh	0	Therms
17-00 Hrs	32.1	kW	16,282	kWh	0	Therms
Total	**32.1**	**kW**	**49,006**	**kWh**	**0**	**Therms**

Proposed Conditions

00-08 Hrs	27.5	kW	9,957	kWh	0	Therms
09-16 Hrs	27.5	kW	19,967	kWh	0	Therms
17-00 Hrs	27.5	kW	15,116	kWh	0	Therms
Total	**27.5**	**kW**	**45,039**	**kWh**	**0**	**Therms**

Total Annual Energy Savings	**4.6**	**kW**
	3,967	**kWh**
	0	**Therms**

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	Family Success Center
Unit Location	RTUs
Mfg	Various
Model #	Various

**RED TEXT IS INPUT

Estimated SF Served by Unit	8250	SF	
Max Cooling Load	197.5	kbtu/hr	400SF/Ton
Max Heating Load	78.1	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	16		
Average internal heat gain	2.0	kbtu/hr	
Inside Cooling Design Temp	78	deg F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	8,152.2	btu/h-degF	
Tbal - Cooling	73.8	deg-F	
Ktot - Heating	2604.2	btu/h-degF	
Tbal - Heating	69.2	deg-F	
DX Cooling System	25.5	tons	
	306	kbtu/hr	
	9.510607049	New EER/SEER/IPLV	
	1.261	kW/Ton	
	11	Age of Unit (yrs)	
	33.99	Full Load kW (degraded 0.5% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	11	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	75.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP	Tons
		Rheem	RSNL-B036CK	2010	10.5	1.00	3
		ICP	PAE090H000AA	2005	10.3	1.00	7.5
		Rheem	RSKA-A060CK	2004	9	1.00	5
		ICP	PAS120H00AA	2006	8.9	1.00	10

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	28.2	0	230.3	286.9	1.000	286.9	33.99	0.80	0
97	23.2	0	189.5	298.8	1.000	298.8	33.99	0.63	0
92	18.2	0	148.7	310.7	1.000	310.7	33.99	0.48	0
87	13.2	52	108.0	322.7	1.000	322.7	33.99	0.33	592
82	8.2	633	67.2	334.6	1.000	334.6	33.99	0.20	4,323
77	3.2	867	26.5	346.5	1.000	346.5	33.99	0.08	2,250
72	-1.8	627	-14.3	358.5	1.000	358.5	33.99	-0.04	-850
		2,179							6,314

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.2	166	-18.8	0.0	1.000	0.0	0.00	-1,605.57	0	-18.85	-5.52	917
57	12.2	125	-31.9	0.0	1.000	0.0	0.00	-2,864.58	0	-31.87	-9.34	1,167
52	17.2	78	-44.9	0.0	1.000	0.0	0.00	-4,269.74	0	-44.89	-13.15	1,026
47	22.2	44	-57.9	0.0	1.000	0.0	0.00	-5,848.06	0	-57.91	-16.97	747
42	27.2	16	-70.9	0.0	1.000	0.0	0.00	-7,633.66	0	-70.93	-20.78	333
37	32.2	5	-83.9	0.0	1.000	0.0	0.00	-9,670.22	0	-83.95	-24.60	123
32	37.2	2	-97.0	0.0	1.000	0.0	0.00	-12,014.66	0	-96.97	-28.41	57
27	42.2	0	-110.0	0.0	1.000	0.0	0.00	-14,742.52	0	-109.99	-32.23	0
22	47.2	0	-123.0	0.0	1.000	0.0	0.00	-17,956.20	0	-123.01	-36.04	0
17	52.2	0	-136.0	0.0	1.000	0.0	0.00	-21,798.21	0	-136.03	-39.86	0
12	57.2	0	-149.0	0.0	1.000	0.0	0.00	-26,472.76	0	-149.05	-43.67	0
		436							0			4,368

Total Cooling kW Demand	32.1	kW
Total Cooling kWh Consumption	6,314	kWh
Total Heating kWh Consumption	4,368	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	Family Success Center
Unit Location	RTUs
Mfg	Various
Model #	Various

*RED TEXT IS INPUT

Estimated SF Served by Unit	6250	SF	
Max Cooling Load	187.5	kbtu/hr	400SF/Ton
Max Heating Load	250.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	15		
Average internal heat gain	2.0	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	8,152.2	btu/h-degF	
Tbal - Cooling	73.8	deg-F	
Ktot - Heating	-8333.3	btu/h-degF	
Tbal - Heating	69.8	deg-F	
DX Cooling System	25.5	tons	
	306	kbtu/hr	
	9.519607043	New EER/SEER/IPLV	
	1.261	kW/Ton	
	11.21560627	Age of Unit (yrs)	
	33.99	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	11	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	75	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	230.3	286.9	1.000	286.9	33.99	0.80	0.00	0
97	23.2	4	189.5	298.8	1.000	298.8	33.99	0.63	0.76	86
92	18.2	172	148.7	310.7	1.000	310.7	33.99	0.48	25.58	2,799
87	13.2	781	108.0	322.7	1.000	322.7	33.99	0.33	84.33	8,884
82	8.2	815	67.2	334.6	1.000	334.6	33.99	0.20	54.78	5,565
77	3.2	619	26.5	346.5	1.000	346.5	33.99	0.08	16.38	1,606
72	-1.8	281	-14.3	358.5	1.000	358.5	33.99	-0.04	-4.02	-381
		2,672							177.81	18,560

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	73	-64.7	0.0	1.000	0.0	0.00	-5,512.93	-47.21	0	-64.68	-18.95	1,383
57	12.8	34	-106.3	0.0	1.000	0.0	0.00	-9,562.35	-3.62	0	-106.34	-31.16	1,059
52	17.8	16	-148.0	0.0	1.000	0.0	0.00	-14,081.83	-2.37	0	-148.01	-43.37	694
47	22.8	5	-189.7	0.0	1.000	0.0	0.00	-19,158.25	-0.95	0	-189.68	-55.58	278
42	27.8	1	-231.3	0.0	1.000	0.0	0.00	-24,801.33	-0.23	0	-231.34	-67.78	68
37	32.8	0	-273.0	0.0	1.000	0.0	0.00	-31,451.61	0.00	0	-273.01	-79.99	0
32	37.8	0	-314.7	0.0	1.000	0.0	0.00	-38,992.15	0.00	0	-314.67	-92.20	0
27	42.8	0	-356.3	0.0	1.000	0.0	0.00	-47,765.86	0.00	0	-356.34	-104.41	0
22	47.8	0	-398.0	0.0	1.000	0.0	0.00	-58,102.19	0.00	0	-398.01	-116.62	0
17	52.8	0	-439.7	0.0	1.000	0.0	0.00	-70,459.40	0.00	0	-439.67	-128.82	0
12	57.8	0	-481.3	0.0	1.000	0.0	0.00	-85,494.38	0.00	0	-481.34	-141.03	0
		129								0			3,482

Total Cooling kW Demand	32.1	kW
Total Cooling kWh Consumption	18,560	kWh
Total Heating kWh Consumption	3,482	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	Family Success Center
Unit Location	RTUs
Mfg	Various
Model #	Various

RED TEXT IS INPUT

Estimated SF Served by Unit	6250	SF	
Max Cooling Load	187.5	kbtu/hr	400SF/Ton
Max Heating Load	250.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	15		
Average internal heat gain	2.0	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	8,152.2	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-8333.3	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	25.5	tons	
	306	kbtu/hr	
	9.519607043	New EER/SEER/IPLV	
	1.261	kW/Ton	
	11.21569627	Age of Unit (yrs)	
	33.99	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	11	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	75	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	230.3	286.9	1.000	286.9	33.99	0.80	0.00	0
97	23.2	0	189.5	298.8	1.000	298.8	33.99	0.63	0.00	0
92	18.2	10	148.7	310.7	1.000	310.7	33.99	0.48	1.49	163
87	13.2	269	108.0	322.7	1.000	322.7	33.99	0.33	29.05	3,080
82	8.2	814	67.2	334.6	1.000	334.6	33.99	0.20	54.71	5,559
77	3.2	867	26.5	346.5	1.000	346.5	33.99	0.08	22.94	2,250
72	-1.8	544	-14.3	358.5	1.000	358.5	33.99	-0.04	-7.78	-738
		2,504							100.40	10,293

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	107	-64.7	0.0	1.000	0.0	0.00	-5,512.93	-6.92	0	-64.68	-18.95	2,028
57	12.8	61	-106.3	0.0	1.000	0.0	0.00	-9,562.35	-6.49	0	-106.34	-31.16	1,901
52	17.8	30	-148.0	0.0	1.000	0.0	0.00	-14,081.83	-4.44	0	-148.01	-43.37	1,301
47	22.8	10	-189.7	0.0	1.000	0.0	0.00	-19,158.25	-1.90	0	-189.68	-55.58	556
42	27.8	3	-231.3	0.0	1.000	0.0	0.00	-24,801.33	-0.69	0	-231.34	-67.78	203
37	32.8	0	-273.0	0.0	1.000	0.0	0.00	-31,451.61	0.00	0	-273.01	-79.99	0
32	37.8	0	-314.7	0.0	1.000	0.0	0.00	-38,892.15	0.00	0	-314.67	-92.20	0
27	42.8	0	-356.3	0.0	1.000	0.0	0.00	-47,765.86	0.00	0	-356.34	-104.41	0
22	47.8	0	-398.0	0.0	1.000	0.0	0.00	-58,102.19	0.00	0	-398.01	-116.62	0
17	52.8	0	-439.7	0.0	1.000	0.0	0.00	-70,459.40	0.00	0	-439.67	-128.82	0
12	57.8	0	-481.3	0.0	1.000	0.0	0.00	-85,494.38	0.00	0	-481.34	-141.03	0
		211								0			5,989

Total Cooling kW Demand	32.1	kW
Total Cooling kWh Consumption	10,293	kWh
Total Heating kWh Consumption	5,989	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility Family Success Center
Unit Location RTUs
Mfg
Model #

*** RED TEXT IS INPUT*

Estimated SF Served by Unit	6250	SF	
Max Cooling Load	187.5	kbtu/hr	400SF/Ton
Max Heating Load	78.1	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	95	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	15		
Average internal heat gain	2.0	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	8,928.6	btu/h-degF	
Tbal - Cooling	73.8	deg-F	
Ktot - Heating	2604.2	btu/h-degF	
Tbal - Heating	69.2	deg-F	
DX Cooling System	25.5	tons	
	306	kbtu/hr	
	11.11764706	New EER/SEER/IPLV	
	1.079	kW/Ton	
	1	Age of Unit (yrs)	
	27.64	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	133.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP	Tons
		Rheem	RSNL B036CK	2010	10.5	1.00	3
		TBD	TBD	2017	11.2	1.00	7.5
		TBD	TBD	2017	11.2	1.00	5
		TBD	TBD	2017	11.2	1.00	10

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	252.0	286.9	1.000	286.9	27.64	0.88	0.00	0
97	23.2	0	207.4	298.8	1.000	298.8	27.64	0.69	0.00	0
92	18.2	0	162.7	310.7	1.000	310.7	27.64	0.52	0.00	0
87	13.2	52	118.1	322.7	1.000	322.7	27.64	0.37	6.14	526
82	8.2	633	73.4	334.6	1.000	334.6	27.64	0.22	46.48	3,839
77	3.2	867	28.8	346.5	1.000	346.5	27.64	0.08	24.96	1,990
72	-1.8	627	-15.9	358.5	1.000	358.5	27.64	-0.04	-9.94	-767
		2,179							67.63	5,589

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.2	166	-18.8	0.0	1.000	0.0	0.00	-1,605.57	-3.13	0	-18.85	-5.52	917
57	12.2	125	-31.9	0.0	1.000	0.0	0.00	-2,864.58	-3.98	0	-31.87	-9.34	1,167
52	17.2	78	-44.9	0.0	1.000	0.0	0.00	-4,269.74	-3.50	0	-44.89	-13.15	1,026
47	22.2	44	-57.9	0.0	1.000	0.0	0.00	-5,848.06	-2.55	0	-57.91	-16.97	747
42	27.2	16	-70.9	0.0	1.000	0.0	0.00	-7,633.66	-1.13	0	-70.93	-20.78	333
37	32.2	5	-83.9	0.0	1.000	0.0	0.00	-9,670.22	-0.42	0	-83.95	-24.60	123
32	37.2	2	-97.0	0.0	1.000	0.0	0.00	-12,014.66	-0.19	0	-96.97	-28.41	57
27	42.2	0	-110.0	0.0	1.000	0.0	0.00	-14,742.52	0.00	0	-109.99	-32.23	0
22	47.2	0	-123.0	0.0	1.000	0.0	0.00	-17,956.20	0.00	0	-123.01	-36.04	0
17	52.2	0	-136.0	0.0	1.000	0.0	0.00	-21,796.21	0.00	0	-136.03	-39.86	0
12	57.2	0	-149.0	0.0	1.000	0.0	0.00	-26,472.76	0.00	0	-149.05	-43.67	0
		436								0			4,368

Total Cooling kW Demand	27.5	kW
Total Cooling kWh Consumption	5,589	kWh
Total Heating kWh Consumption	4,368	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

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Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	Family Success Center		
Unit Location	RTUs		
Mfg			
Model #			
**RED TEXT IS INPUT			
Estimated SF Served by Unit	6250	SF	
Max Cooling Load	187.5	kbtu/hr	400SF/Ton
Max Heating Load	250.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	85	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	15		
Average internal heat gain	2.0	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	8,828.6	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-8333.3	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	25.5	tons	
	306	kbtu/hr	
	11.11764706	New EER/SEER/IPLV	
	1.079	kW/Ton	
	0.823529412	Age of Unit (yrs)	
	27.64	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	1	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	133	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	252.0	286.9	1.000	286.8	27.64	0.88	0.00	0
97	23.2	4	207.4	298.8	1.000	298.8	27.64	0.69	0.83	77
92	18.2	172	162.7	310.7	1.000	310.7	27.64	0.52	27.98	2,489
87	13.2	781	118.1	322.7	1.000	322.7	27.64	0.37	92.21	7,898
82	8.2	815	73.4	334.6	1.000	334.6	27.64	0.22	59.84	4,943
77	3.2	619	28.8	346.5	1.000	346.5	27.64	0.08	17.82	1,421
72	-1.8	281	-15.9	358.5	1.000	358.5	27.64	-0.04	-4.48	-344
		2,672							184.24	16,484

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	73	-64.7	0.0	1.000	0.0	0.00	-5,512.93	-4.72	0	-64.68	-18.95	1,383
57	12.8	34	-106.3	0.0	1.000	0.0	0.00	-9,562.35	-3.62	0	-106.34	-31.16	1,059
52	17.8	16	-148.0	0.0	1.000	0.0	0.00	-14,081.83	-2.37	0	-148.01	-43.37	694
47	22.8	5	-189.7	0.0	1.000	0.0	0.00	-19,158.25	-0.95	0	-189.68	-55.58	278
42	27.8	1	-231.3	0.0	1.000	0.0	0.00	-24,801.33	-0.23	0	-231.34	-67.78	68
37	32.8	0	-273.0	0.0	1.000	0.0	0.00	-31,451.61	0.00	0	-273.01	-79.99	0
32	37.8	0	-314.7	0.0	1.000	0.0	0.00	-38,892.15	0.00	0	-314.67	-92.20	0
27	42.8	0	-356.3	0.0	1.000	0.0	0.00	-47,765.86	0.00	0	-356.34	-104.41	0
22	47.8	0	-398.0	0.0	1.000	0.0	0.00	-58,102.19	0.00	0	-398.01	-116.62	0
17	52.8	0	-439.7	0.0	1.000	0.0	0.00	-70,459.40	0.00	0	-439.67	-128.82	0
12	57.8	0	-481.3	0.0	1.000	0.0	0.00	-85,494.38	0.00	0	-481.34	-141.03	0
		129								0			3,482

Total Cooling kW Demand	27.5	kW
Total Cooling kWh Consumption	16,484	kWh
Total Heating kWh Consumption	3,482	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	Family Success Center
Unit Location	RTUs
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	6250	SF	
Max Cooling Load	187.5	kbtu/hr	400SF/Ton
Max Heating Load	250.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	85	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	15		
Average internal heat gain	2.0	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	8,826.6	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-8333.3	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	25.5	tons	
	306	kbtu/hr	
	11.11764706	New EER/SEER/IPLV	
	1.079	kW/Ton	
	0.823529412	Age of Unit (yrs)	
	27.64	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	1	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	133	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	252.0	286.9	1.000	286.9	27.64	0.88	0.00	0
97	23.2	0	207.4	298.8	1.000	298.8	27.64	0.69	0.00	0
92	18.2	10	162.7	310.7	1.000	310.7	27.64	0.52	1.63	145
87	13.2	269	118.1	322.7	1.000	322.7	27.64	0.37	31.76	2,720
82	8.2	814	73.4	334.6	1.000	334.6	27.64	0.22	59.77	4,937
77	3.2	867	28.8	346.5	1.000	346.5	27.64	0.08	24.96	1,990
72	-1.8	544	-15.9	358.5	1.000	358.5	27.64	-0.04	-8.63	-665
		2,504							109.49	9,127

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	107	-64.7	0.0	1.000	0.0	0.00	-5,512.93	-6.92	0	-64.68	-18.95	2,028
57	12.8	61	-106.3	0.0	1.000	0.0	0.00	-9,562.35	-6.49	0	-106.34	-31.16	1,901
52	17.8	30	-148.0	0.0	1.000	0.0	0.00	-14,081.83	-4.44	0	-148.01	-43.37	1,301
47	22.8	10	-189.7	0.0	1.000	0.0	0.00	-19,158.25	-1.90	0	-189.68	-55.58	556
42	27.8	3	-231.3	0.0	1.000	0.0	0.00	-24,801.33	-0.69	0	-231.34	-67.78	203
37	32.8	0	-273.0	0.0	1.000	0.0	0.00	-31,451.61	0.00	0	-273.01	-79.99	0
32	37.8	0	-314.7	0.0	1.000	0.0	0.00	-38,892.15	0.00	0	-314.67	-92.20	0
27	42.8	0	-356.3	0.0	1.000	0.0	0.00	-47,765.86	0.00	0	-356.34	-104.41	0
22	47.8	0	-398.0	0.0	1.000	0.0	0.00	-58,102.19	0.00	0	-398.01	-116.62	0
17	52.8	0	-439.7	0.0	1.000	0.0	0.00	-70,459.40	0.00	0	-439.67	-128.82	0
12	57.8	0	-481.3	0.0	1.000	0.0	0.00	-85,494.38	0.00	0	-481.34	-141.03	0
		211								0			5,989

Total Cooling kW Demand	27.5	kW
Total Cooling kWh Consumption	9,127	kWh
Total Heating kWh Consumption	5,989	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

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Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Broward County
Energy Savings Performance Contract
Whole Building Energy Model

Sexual Assault Treatment Center

MODEL CALIBRATION	Electric kWh	Nat. Gas Therms
Baseline	183,120	0
eQUEST Model	183,658	0
Error	0.29%	#DIV/0!

BASELINE MODEL

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	12,529	11,895	13,721	14,415	15,594	17,315	18,419	18,724	17,580	16,155	14,080	13,145	183,658
MAX KW	35.8	35	37.5	38.3	42	45.6	44.8	44.8	47.2	42.3	38.1	36.7	47.2
DAY/HR	26/16	42960	42809	23/15	25/14	30/16	13/16	10/15	14/14	42900	22/16	15/15	42992

FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

ECM - Lighting Upgrade

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	10,129	9,738	10,794	11,548	12,727	14,356	15,389	15,693	14,657	13,296	11,416	10,531	150,272
MAX KW	28.4	33.8	28	28.9	32.5	36	35.3	35.2	37.5	32.7	28.7	28.7	37.5
DAY/HR	19/9	43017	42809	23/15	25/14	30/16	13/16	18/15	14/14	42900	23/15	17/9	42992

FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	2,400	2,257	2,927	2,867	2,867	2,959	3,028	3,031	2,903	2,859	2,670	2,614	33,386	18.7%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	7.40	1.20	9.50	9.40	9.50	9.60	9.60	9.60	9.70	9.60	9.50	8.00	9.70	8.55	Avg Monthly kW Savings

ECM - Network Thermostats

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	8,357	8,027	9,158	9,670	10,342	12,026	12,867	13,139	12,240	10,957	9,430	8,702	124,915
MAX KW	32.7	34.5	28.8	30.1	34	37.5	37.1	37.7	39.6	34.6	29.9	27.9	39.6
DAY/HR	19/9	43017	30/14	21/13	25/14	29/14	13/16	42780	14/14	42839	23/15	15/15	42992

FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	1,772	1,711	1,636	1,878	2,385	2,330	2,522	2,554	2,417	2,339	1,986	1,929	25,367	13.8%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	-4.30	-0.70	-0.80	-1.20	-1.50	-1.50	-1.00	-2.50	-2.10	-1.80	-1.20	0.80	-2.10	-1.56	Avg Monthly kW Savings

ECM - VAV Ventilation & Exhaust

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	7,994	7,563	8,600	9,040	9,571	10,714	11,322	11,629	10,689	10,071	8,607	8,297	114,593
MAX KW	30.8	26.2	24.5	25.3	27.8	30.1	29.8	30.5	30.9	28.5	25.4	24	30.9
DAY/HR	19/7	43015	42809	23/15	25/14	30/16	13/16	42781	14/14	42840	23/15	15/15	42992

FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	363	464	470	622	771	1,312	1,545	1,510	1,351	886	623	405	10,322	5.6%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	1.90	8.30	4.30	4.80	6.20	7.40	7.30	7.20	8.70	6.10	4.50	3.90	8.70	5.87	Avg Monthly kW Savings

ECM - R22 HVAC Replacement

EM1 ELECTRICITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
KWH	7,881	7,446	8,510	8,849	9,352	10,411	10,996	11,297	10,589	9,834	8,625	8,162	111,958
MAX KW	30.0	25.2	23.6	24.4	26.6	28.7	28.4	29.1	29.5	27.2	24.4	23.2	30.0
DAY/HR	19/7	43015	42809	23/15	25/14	30/16	13/16	42781	14/14	42840	23/15	15/15	42754

FM1 NATURAL-GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
THERM	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX THERM/HR	0	0	0	0	0	0	0	0	0	0	0	0	0
DAY/HR	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

SAVINGS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	Savings Percent of Baseline	
KWH SAVINGS	113	117	172	199	219	303	326	332	300	237	192	135	2,635	1.4%	
THERM SAVINGS	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	
KW SAVINGS	0.00	0.00	0.00	0.00	1.20	1.40	1.40	1.40	1.40	1.30	1.00	0.00	0.10	0.98	Avg Monthly kW Savings

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split System - Savings Summary

Facility EAP Our House
Unit Location AHU-1

Existing Conditions

Mfg	Ruud
Model #	UHSA-HM3017JA
Date Mfg	2005

Baseline Data

Peak kW	0
kWh	15,231

Proposed Conditions

Mfg	TBD
Model #	TBD

Energy Usage

Existing Conditions

00-08 Hrs	2.6	kW	1,880	kWh	0	Therms
09-16 Hrs	2.6	kW	3,487	kWh	0	Therms
17-00 Hrs	2.6	kW	2,774	kWh	0	Therms
Total	**2.6**	**kW**	**8,141**	**kWh**	**0**	**Therms**
	#DIV/0!		*53.4%*			

Proposed Conditions

00-08 Hrs	2.6	kW	1,847	kWh	0	Therms
09-16 Hrs	2.6	kW	3,403	kWh	0	Therms
17-00 Hrs	2.6	kW	2,723	kWh	0	Therms
Total	**2.6**	**kW**	**7,973**	**kWh**	**0**	**Therms**
	#DIV/0!		*52.3%*			

Total Annual Energy Savings	**0.0**	**kW**
	168	**kWh**
	0	**Therms**

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	EAP Our House
Unit Location	AHU-1
Mfg	Ruud
Model #	UHSA-HM3017JA

***RED TEXT IS INPUT*

Estimated SF Served by Unit	1100	SF	
Max Cooling Load	33.0	kbtu/hr	400SF/Ton
Max Heating Load	13.8	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.4	kbtu/hr	
Inside Cooling Design Temp	73	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	1,375.0	btu/h-degF	
Tbal - Cooling	72.7	deg-F	
Ktot - Heating	458.3	btu/h-degF	
Tbal - Heating	69.1	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	6	Age of Unit (yrs)	
	2.69	Full Load kW (degraded 0.5% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	6	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	7.20	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
AHU-1	EAP Our House	Ruud	UHSA-HM3017JA	2011	11.5	1.00

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	29.3	0	40.3	28.1	1.000	28.1	2.69	1.00	0
97	24.3	0	33.4	29.3	1.000	29.3	2.69	1.00	0
92	19.3	0	26.5	30.5	1.000	30.5	2.69	0.87	0
87	14.3	54	19.7	31.6	1.000	31.6	2.69	0.62	90
82	9.3	643	12.8	32.8	1.000	32.8	2.69	0.39	673
77	4.3	869	5.9	34.0	1.000	34.0	2.69	0.17	406
72	-0.7	624	-1.0	35.1	1.000	35.1	2.69	-0.03	-47
		2,190							1,122

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.1	165	-3.3	0.0	1.000	0.0	0.00	-278.49	0	-3.28	-0.96	158
57	12.1	123	-5.6	0.0	1.000	0.0	0.00	-499.85	0	-5.57	-1.63	201
52	17.1	80	-7.9	0.0	1.000	0.0	0.00	-746.91	0	-7.86	-2.30	184
47	22.1	43	-10.1	0.0	1.000	0.0	0.00	-1,024.41	0	-10.15	-2.97	128
42	27.1	15	-12.4	0.0	1.000	0.0	0.00	-1,338.36	0	-12.44	-3.65	55
37	32.1	5	-14.7	0.0	1.000	0.0	0.00	-1,696.43	0	-14.73	-4.32	22
32	37.1	2	-17.0	0.0	1.000	0.0	0.00	-2,108.63	0	-17.02	-4.99	10
27	42.1	0	-19.3	0.0	1.000	0.0	0.00	-2,588.25	0	-19.32	-5.66	0
22	47.1	0	-21.6	0.0	1.000	0.0	0.00	-3,153.28	0	-21.61	-6.33	0
17	52.1	0	-23.9	0.0	1.000	0.0	0.00	-3,828.79	0	-23.90	-7.00	0
12	57.1	0	-26.2	0.0	1.000	0.0	0.00	-4,650.68	0	-26.19	-7.67	0
		433							0			758

Total Cooling kW Demand	2.6	kW
Total Cooling kWh Consumption	1,122	kWh
Total Heating kWh Consumption	758	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	EAP Our House
Unit Location	AHU-1
Mfg	Ruud
Model #	UHSA-HM3017JA

*RED TEXT IS INPUT

Estimated SF Served by Unit	1100	SF	
Max Cooling Load	33.0	kbtu/hr	400SF/Ton
Max Heating Load	44.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.4	kbtu/hr	
Inside Cooling Design Temp	73	deg-F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	1,375.0	btu/h-degF	
Tbal - Cooling	72.7	deg F	
Ktot - Heating	-1466.7	btu/h-degF	
Tbal - Heating	69.7	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	6	Age of Unit (yrs)	
	2.80	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	6	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	7.2	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	29.3	0	40.3	28.1	1.000	28.1	2.69	1.00	0.00	0
97	24.3	5	33.4	29.3	1.000	29.3	2.69	1.00	0.15	13
92	19.3	174	26.5	30.5	1.000	30.5	2.69	0.87	4.62	407
87	14.3	787	19.7	31.6	1.000	31.6	2.69	0.62	15.46	1,314
82	9.3	816	12.8	32.8	1.000	32.8	2.69	0.39	10.42	854
77	4.3	609	5.9	34.0	1.000	34.0	2.69	0.17	3.59	284
72	-0.7	278	-1.0	35.1	1.000	35.1	2.69	-0.03	-0.27	-21
		2,669							33.97	2,852

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.7	70	-11.3	0.0	1.000	0.0	0.00	-966.18	-7.93	0	-11.35	-3.32	233
57	12.7	34	-18.7	0.0	1.000	0.0	0.00	-1,678.66	-0.63	0	-18.68	-5.47	186
52	17.7	17	-26.0	0.0	1.000	0.0	0.00	-2,473.83	-0.44	0	-26.01	-7.62	130
47	22.7	5	-33.3	0.0	1.000	0.0	0.00	-3,367.00	-0.17	0	-33.34	-9.77	49
42	27.7	2	-40.7	0.0	1.000	0.0	0.00	-4,377.47	-0.08	0	-40.68	-11.92	24
37	32.7	1	-48.0	0.0	1.000	0.0	0.00	-5,529.95	-0.05	0	-48.01	-14.07	14
32	37.7	0	-55.3	0.0	1.000	0.0	0.00	-6,856.67	0.00	0	-55.34	-16.22	0
27	42.7	0	-62.7	0.0	1.000	0.0	0.00	-8,400.36	0.00	0	-62.67	-18.36	0
22	47.7	0	-70.0	0.0	1.000	0.0	0.00	-10,218.98	0.00	0	-70.01	-20.51	0
17	52.7	0	-77.3	0.0	1.000	0.0	0.00	-12,393.16	0.00	0	-77.34	-22.66	0
12	57.7	0	-84.7	0.0	1.000	0.0	0.00	-15,038.48	0.00	0	-84.67	-24.81	0
		129								0			635

Total Cooling kW Demand	2.6	kW
Total Cooling kWh Consumption	2,852	kWh
Total Heating kWh Consumption	635	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	EAP Our House
Unit Location	AHU-1
Mfg	Ruud
Model #	UHSA-HM3017JA

RED TEXT IS INPUT

Estimated SF Served by Unit	1100	SF	
Max Cooling Load	33.0	kbtu/hr	400SF/Ton
Max Heating Load	44.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.4	kbtu/hr	
Inside Cooling Design Temp	73	deg F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	1,375.0	btu/h-degF	
Tbal - Cooling	72.7	deg F	
Ktot - Heating	-1466.7	btu/h-degF	
Tbal - Heating	69.7	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	6	Age of Unit (yrs)	
	2.80	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	6	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	7.2	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	29.3	0	40.3	28.1	1.000	28.1	2.69	1.00	0.00	0
97	24.3	1	33.4	29.3	1.000	29.3	2.69	1.00	0.03	3
92	19.3	11	26.5	30.5	1.000	30.5	2.69	0.87	0.29	26
87	14.3	275	19.7	31.6	1.000	31.6	2.69	0.62	5.40	459
82	9.3	821	12.8	32.8	1.000	32.8	2.69	0.39	10.49	859
77	4.3	862	5.9	34.0	1.000	34.0	2.69	0.17	5.09	402
72	-0.7	539	-1.0	35.1	1.000	35.1	2.69	-0.03	-0.53	-40
		2,509							20.77	1,709

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.7	106	-11.3	0.0	1.000	0.0	0.00	-966.18	-1.20	0	-11.35	-3.32	352
57	12.7	60	-18.7	0.0	1.000	0.0	0.00	-1,678.66	-1.12	0	-18.68	-5.47	328
52	17.7	31	-26.0	0.0	1.000	0.0	0.00	-2,473.83	-0.81	0	-26.01	-7.62	236
47	22.7	10	-33.3	0.0	1.000	0.0	0.00	-3,367.00	-0.33	0	-33.34	-9.77	98
42	27.7	3	-40.7	0.0	1.000	0.0	0.00	-4,377.47	-0.12	0	-40.68	-11.92	36
37	32.7	1	-48.0	0.0	1.000	0.0	0.00	-5,529.95	-0.05	0	-48.01	-14.07	14
32	37.7	0	-55.3	0.0	1.000	0.0	0.00	-6,856.67	0.00	0	-55.34	-16.22	0
27	42.7	0	-62.7	0.0	1.000	0.0	0.00	-8,400.36	0.00	0	-62.67	-18.36	0
22	47.7	0	-70.0	0.0	1.000	0.0	0.00	-10,218.98	0.00	0	-70.01	-20.51	0
17	52.7	0	-77.3	0.0	1.000	0.0	0.00	-12,393.16	0.00	0	-77.34	-22.66	0
12	57.7	0	-84.7	0.0	1.000	0.0	0.00	-15,038.48	0.00	0	-84.67	-24.81	0
		211								0			1,064

Total Cooling kW Demand	2.6	kW
Total Cooling kWh Consumption	1,709	kWh
Total Heating kWh Consumption	1,064	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility EAP Our House
Unit Location AHU-1
Mfg
Model #

***RED TEXT IS INPUT*

Estimated SF Served by Unit	1100	SF	
Max Cooling Load	33.0	kbtu/hr	400SF/Ton
Max Heating Load	13.8	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.4	kbtu/hr	
Inside Cooling Design Temp	73	deg F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	1,375.0	btu/h.degF	
Tbal - Cooling	72.7	deg-F	
Ktot - Heating	-458.3	btu/h.degF	
Tbal - Heating	69.1	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	2.61	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	7.20	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	11.5	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	29.3	0	40.3	28.1	1.000	28.1	2.61	1.00	0.00	0
97	24.3	0	33.4	29.3	1.000	29.3	2.61	1.00	0.00	0
92	19.3	0	26.5	30.5	1.000	30.5	2.61	0.87	0.00	0
87	14.3	54	19.7	31.6	1.000	31.6	2.61	0.62	1.06	88
82	9.3	643	12.8	32.8	1.000	32.8	2.61	0.39	8.21	653
77	4.3	869	5.9	34.0	1.000	34.0	2.61	0.17	5.13	394
72	-0.7	624	-1.0	35.1	1.000	35.1	2.61	-0.03	-0.81	-45
		2,190							13.79	1,089

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.1	165	-3.3	0.0	1.000	0.0	0.00	-278.49	-0.54	0	-3.28	-0.96	158
57	12.1	123	-5.6	0.0	1.000	0.0	0.00	-499.85	-0.68	0	-5.57	-1.63	201
52	17.1	80	-7.9	0.0	1.000	0.0	0.00	-746.91	-0.63	0	-7.86	-2.30	184
47	22.1	43	-10.1	0.0	1.000	0.0	0.00	-1,024.41	-0.44	0	-10.15	-2.97	129
42	27.1	15	-12.4	0.0	1.000	0.0	0.00	-1,338.36	-0.19	0	-12.44	-3.65	55
37	32.1	5	-14.7	0.0	1.000	0.0	0.00	-1,696.43	-0.07	0	-14.73	-4.32	22
32	37.1	2	-17.0	0.0	1.000	0.0	0.00	-2,108.63	-0.03	0	-17.02	-4.99	10
27	42.1	0	-19.3	0.0	1.000	0.0	0.00	-2,588.25	0.00	0	-19.32	-5.66	0
22	47.1	0	-21.6	0.0	1.000	0.0	0.00	-3,153.28	0.00	0	-21.61	-6.33	0
17	52.1	0	-23.9	0.0	1.000	0.0	0.00	-3,828.79	0.00	0	-23.90	-7.00	0
12	57.1	0	-26.2	0.0	1.000	0.0	0.00	-4,650.69	0.00	0	-26.19	-7.67	0
		433								0			758

Total Cooling kW Demand	2.6	kW
Total Cooling kWh Consumption	1,089	kWh
Total Heating kWh Consumption	758	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	EAP Our House
Unit Location	AHU-1
Mfg	
Model #	

*RED TEXT IS INPUT

Estimated SF Served by Unit	1100	SF	
Max Cooling Load	33.0	kbtu/hr	400SF/Ton
Max Heating Load	44.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.4	kbtu/hr	
Inside Cooling Design Temp	73	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	1,375.0	btu/h-degF	
Tbal - Cooling	72.7	deg-F	
Ktot - Heating	-1466.7	btu/h-degF	
Tbal - Heating	69.7	deg-F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	2.61	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	7.2	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	29.3	0	40.3	28.1	1.000	28.1	2.61	1.00	0.00	0
97	24.3	5	33.4	29.3	1.000	29.3	2.61	1.00	0.15	13
92	19.3	174	26.5	30.5	1.000	30.5	2.61	0.87	4.62	395
87	14.3	787	19.7	31.6	1.000	31.6	2.61	0.62	15.46	1,275
82	9.3	816	12.8	32.8	1.000	32.8	2.61	0.39	10.42	829
77	4.3	609	5.9	34.0	1.000	34.0	2.61	0.17	3.59	276
72	-0.7	278	-1.0	35.1	1.000	35.1	2.61	-0.03	-0.27	-20
		2,669							33.97	2,768

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.7	70	-11.3	0.0	1.000	0.0	0.00	-966.18	-0.79	0	-11.35	-3.32	233
57	12.7	34	-18.7	0.0	1.000	0.0	0.00	-1,678.66	-0.63	0	-18.68	-5.47	186
52	17.7	17	-26.0	0.0	1.000	0.0	0.00	-2,473.83	-0.44	0	-26.01	-7.62	130
47	22.7	5	-33.3	0.0	1.000	0.0	0.00	-3,367.00	-0.17	0	-33.34	-9.77	49
42	27.7	2	-40.7	0.0	1.000	0.0	0.00	-4,377.47	-0.08	0	-40.68	-11.92	24
37	32.7	1	-48.0	0.0	1.000	0.0	0.00	-5,529.95	-0.05	0	-48.01	-14.07	14
32	37.7	0	-55.3	0.0	1.000	0.0	0.00	-6,856.67	0.00	0	-55.34	-16.22	0
27	42.7	0	-62.7	0.0	1.000	0.0	0.00	-8,400.36	0.00	0	-62.67	-18.36	0
22	47.7	0	-70.0	0.0	1.000	0.0	0.00	-10,218.98	0.00	0	-70.01	-20.51	0
17	52.7	0	-77.3	0.0	1.000	0.0	0.00	-12,393.16	0.00	0	-77.34	-22.66	0
12	57.7	0	-84.7	0.0	1.000	0.0	0.00	-15,038.48	0.00	0	-84.67	-24.81	0
		129								0			635

Total Cooling kW Demand	2.6	kW
Total Cooling kWh Consumption	2,768	kWh
Total Heating kWh Consumption	635	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	EAP Our House
Unit Location	AHU-1
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	1100	SF	
Max Cooling Load	33.0	kbtu/hr	400SF/Ton
Max Heating Load	44.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.4	kbtu/hr	
Inside Cooling Design Temp	73	deg-F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	1,375.0	btu/h-degF	
Tbal - Cooling	72.7	deg F	
Ktot - Heating	-1466.7	btu/h-degF	
Tbal - Heating	69.7	deg F	
DX Cooling System	2.5	tons	
	30	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	2.61	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	7.2	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	29.3	0	40.3	28.1	1.000	28.1	2.61	1.00	0.00	0
97	24.3	1	33.4	29.3	1.000	29.3	2.61	1.00	0.03	3
92	19.3	11	26.5	30.5	1.000	30.5	2.61	0.87	0.29	25
87	14.3	275	19.7	31.6	1.000	31.6	2.61	0.62	5.40	446
82	9.3	821	12.8	32.8	1.000	32.8	2.61	0.39	10.49	834
77	4.3	862	5.9	34.0	1.000	34.0	2.61	0.17	5.09	391
72	-0.7	539	-1.0	35.1	1.000	35.1	2.61	-0.03	-0.53	-39
		2,509							20.77	1,659

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.7	106	-11.3	0.0	1.000	0.0	0.00	-966.18	-1.20	0	-11.35	-3.32	352
57	12.7	60	-18.7	0.0	1.000	0.0	0.00	-1,678.66	-1.12	0	-18.68	-5.47	328
52	17.7	31	-26.0	0.0	1.000	0.0	0.00	-2,473.83	-0.81	0	-26.01	-7.62	236
47	22.7	10	-33.3	0.0	1.000	0.0	0.00	-3,367.00	-0.33	0	-33.34	-9.77	98
42	27.7	3	-40.7	0.0	1.000	0.0	0.00	-4,377.47	-0.12	0	-40.68	-11.92	36
37	32.7	1	-48.0	0.0	1.000	0.0	0.00	-5,529.95	-0.05	0	-48.01	-14.07	14
32	37.7	0	-55.3	0.0	1.000	0.0	0.00	-6,856.67	0.00	0	-55.34	-16.22	0
27	42.7	0	-62.7	0.0	1.000	0.0	0.00	-8,400.36	0.00	0	-62.67	-18.36	0
22	47.7	0	-70.0	0.0	1.000	0.0	0.00	-10,218.98	0.00	0	-70.01	-20.51	0
17	52.7	0	-77.3	0.0	1.000	0.0	0.00	-12,393.16	0.00	0	-77.34	-22.66	0
12	57.7	0	-84.7	0.0	1.000	0.0	0.00	-15,038.48	0.00	0	-84.67	-24.81	0
		211								0			1,064

Total Cooling kW Demand	2.6	kW
Total Cooling kWh Consumption	1,659	kWh
Total Heating kWh Consumption	1,064	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split System - Savings Summary

Facility Mosquito Control
Unit Location AHU-1

Existing Conditions
Mfg
Model #
Date Mfg

Baseline Data

Peak kW	32
kWh	107,287

Proposed Conditions
Mfg
Model #

Energy Usage

Existing Conditions

00-08 Hrs	7.6	kW	3,920	kWh	0	Therms
09-16 Hrs	7.6	kW	7,953	kWh	0	Therms
17-00 Hrs	7.6	kW	5,994	kWh	0	Therms
Total	**7.6**	**kW**	**17,867**	**kWh**	**0**	**Therms**
	23.7%		*16.7%*			

Proposed Conditions

00-08 Hrs	6.8	kW	3,588	kWh	0	Therms
09-16 Hrs	6.8	kW	6,982	kWh	0	Therms
17-00 Hrs	6.8	kW	5,453	kWh	0	Therms
Total	**6.8**	**kW**	**16,024**	**kWh**	**0**	**Therms**
	21.2%		*14.9%*			

Unadjusted Annual Savings		
	0.8	kW
	1,843	kWh
	0	Therms

Adjusted for BAS	
0.8	**kW**
1006	**kWh**

Broward County
Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	Mosquito Control
Unit Location	AHU-1
Mfg	0
Model #	0

**RED TEXT IS INPUT

Estimated SF Served by Unit	2400	SF	
Max Cooling Load	72.0	kbtu/hr	400SF/Ton
Max Heating Load	30.0	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	3,130.4	btu/h-degF	
Tbal - Cooling	73.9	deg-F	
Ktot - Heating	-1000.0	btu/h-degF	
Tbal - Heating	69.3	deg-F	
DX Cooling System	6.5	tons	
	78	kbtu/hr	
	10.3	New EER/SEER/IPLV	
	1.165	kW/Ton	
	10	Age of Unit (yrs)	
	7.98	Full Load kW(degraded 0.5% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	10	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	9.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
AHU-1		Rheem	RAWD-078CAZ	2007	10.3	1.00

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	28.2	0	88.3	73.1	1.000	73.1	7.96	1.00	0
97	23.2	0	72.7	76.2	1.000	76.2	7.96	0.95	0
92	18.2	0	57.0	79.2	1.000	79.2	7.96	0.72	0
87	13.2	54	41.4	82.3	1.000	82.3	7.96	0.50	216
82	8.2	643	25.7	85.3	1.000	85.3	7.96	0.30	1,543
77	3.2	869	10.1	88.3	1.000	88.3	7.96	0.11	788
72	-1.8	624	-5.6	91.4	1.000	91.4	7.96	-0.06	-304
		2,190							2,243

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.3	165	-7.3	0.0	1.000	0.0	0.00	-625.18	0	-7.35	-2.15	355
57	12.3	123	-12.3	0.0	1.000	0.0	0.00	-1,109.11	0	-12.34	-3.62	445
52	17.3	80	-17.3	0.0	1.000	0.0	0.00	-1,649.22	0	-17.34	-5.08	407
47	22.3	43	-22.3	0.0	1.000	0.0	0.00	-2,255.89	0	-22.34	-6.55	282
42	27.3	15	-27.3	0.0	1.000	0.0	0.00	-2,942.23	0	-27.34	-8.01	120
37	32.3	5	-32.3	0.0	1.000	0.0	0.00	-3,725.04	0	-32.34	-9.48	47
32	37.3	2	-37.3	0.0	1.000	0.0	0.00	-4,626.19	0	-37.34	-10.94	22
27	42.3	0	-42.3	0.0	1.000	0.0	0.00	-5,674.71	0	-42.34	-12.41	0
22	47.3	0	-47.3	0.0	1.000	0.0	0.00	-6,909.98	0	-47.34	-13.87	0
17	52.3	0	-52.3	0.0	1.000	0.0	0.00	-8,386.75	0	-52.34	-15.34	0
12	57.3	0	-57.3	0.0	1.000	0.0	0.00	-10,183.54	0	-57.34	-16.80	0
		433							0			1,677

Total Cooling kW Demand	7.6	kW
Total Cooling kWh Consumption	2,243	kWh
Total Heating kWh Consumption	1,677	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	Mosquito Control
Unit Location	AHU-1
Mfg	0
Model #	0

*RED TEXT IS INPUT

Estimated SF Served by Unit	2400	SF	
Max Cooling Load	72.0	kbtu/hr	400SF/Ton
Max Heating Load	96.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	3,130.4	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-3200.0	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	6.5	tons	
	78	kbtu/hr	
	10.3	New EER/SEER/IPLV	
	1.165	kW/Ton	
	10	Age of Unit (yrs)	
	7.98	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	10	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	9	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	88.3	73.1	1.000	73.1	7.96	1.00	0.00	0
97	23.2	5	72.7	76.2	1.000	76.2	7.96	0.95	0.36	38
92	18.2	174	57.0	79.2	1.000	79.2	7.96	0.72	9.92	997
87	13.2	787	41.4	82.3	1.000	82.3	7.96	0.50	32.55	3,150
82	8.2	816	25.7	85.3	1.000	85.3	7.96	0.30	20.98	1,958
77	3.2	609	10.1	88.3	1.000	88.3	7.96	0.11	6.13	552
72	-1.8	278	-5.6	91.4	1.000	91.4	7.96	-0.06	-1.56	-135
		2,669							68.39	6,560

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	70	-24.9	0.0	1.000	0.0	0.00	-2,125.60	-17.45	0	-24.95	-7.31	512
57	12.8	34	-40.9	0.0	1.000	0.0	0.00	-3,681.06	-1.39	0	-40.94	-12.00	408
52	17.8	17	-56.9	0.0	1.000	0.0	0.00	-5,417.06	-0.97	0	-56.94	-16.68	284
47	22.8	5	-72.9	0.0	1.000	0.0	0.00	-7,367.00	-0.36	0	-72.94	-21.37	107
42	27.8	2	-88.9	0.0	1.000	0.0	0.00	-9,573.02	-0.18	0	-88.94	-26.06	52
37	32.8	1	-104.9	0.0	1.000	0.0	0.00	-12,089.09	-0.10	0	-104.94	-30.75	31
32	37.8	0	-120.9	0.0	1.000	0.0	0.00	-14,985.54	0.00	0	-120.94	-35.44	0
27	42.8	0	-136.9	0.0	1.000	0.0	0.00	-18,355.67	0.00	0	-136.94	-40.12	0
22	47.8	0	-152.9	0.0	1.000	0.0	0.00	-22,326.03	0.00	0	-152.94	-44.81	0
17	52.8	0	-168.9	0.0	1.000	0.0	0.00	-27,072.65	0.00	0	-168.94	-49.50	0
12	57.8	0	-184.9	0.0	1.000	0.0	0.00	-32,847.94	0.00	0	-184.94	-54.19	0
		129								0			1,393

Total Cooling kW Demand	7.6	kW
Total Cooling kWh Consumption	6,560	kWh
Total Heating kWh Consumption	1,393	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	Mesquite Control
Unit Location	AHU-1
Mfg	0
Model #	0

**RED TEXT IS INPUT

Estimated SF Served by Unit	2400	SF	
Max Cooling Load	72.0	kbtu/hr	400SF/Ton
Max Heating Load	96.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	3,130.4	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-3200.0	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	6.5	tons	
	78	kbtu/hr	
	10.3	New EER/SEER/IPLV	
	1.165	kW/Ton	
	10	Age of Unit (yrs)	
	7.98	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	10	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	9	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	88.3	73.1	1.000	73.1	7.98	1.00	0.00	0
97	23.2	1	72.7	76.2	1.000	76.2	7.98	0.95	0.07	8
92	18.2	11	57.0	79.2	1.000	79.2	7.98	0.72	0.63	63
87	13.2	275	41.4	82.3	1.000	82.3	7.98	0.50	11.37	1,101
82	8.2	821	25.7	85.3	1.000	85.3	7.98	0.30	21.11	1,970
77	3.2	862	10.1	88.3	1.000	88.3	7.98	0.11	8.67	781
72	-1.8	539	-5.8	91.4	1.000	91.4	7.98	-0.06	-3.02	-263
		2,509							38.84	3,660

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	106	-24.9	0.0	1.000	0.0	0.00	-2,125.60	-2.64	0	-24.95	-7.31	775
57	12.8	60	-40.9	0.0	1.000	0.0	0.00	-3,681.06	-2.46	0	-40.94	-12.00	720
52	17.8	31	-56.9	0.0	1.000	0.0	0.00	-5,417.06	-1.76	0	-56.94	-16.68	517
47	22.8	10	-72.9	0.0	1.000	0.0	0.00	-7,367.00	-0.73	0	-72.94	-21.37	214
42	27.8	3	-88.9	0.0	1.000	0.0	0.00	-9,573.02	-0.27	0	-88.94	-26.06	78
37	32.8	1	-104.9	0.0	1.000	0.0	0.00	-12,089.09	-0.10	0	-104.94	-30.75	31
32	37.8	0	-120.9	0.0	1.000	0.0	0.00	-14,985.54	0.00	0	-120.94	-35.44	0
27	42.8	0	-136.9	0.0	1.000	0.0	0.00	-18,355.67	0.00	0	-136.94	-40.12	0
22	47.8	0	-152.9	0.0	1.000	0.0	0.00	-22,326.03	0.00	0	-152.94	-44.81	0
17	52.8	0	-168.9	0.0	1.000	0.0	0.00	-27,072.65	0.00	0	-168.94	-49.50	0
12	57.8	0	-184.9	0.0	1.000	0.0	0.00	-32,847.94	0.00	0	-184.94	-54.19	0
		211								0			2,334

Total Cooling kW Demand	7.6	kW
Total Cooling kWh Consumption	3,660	kWh
Total Heating kWh Consumption	2,334	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility Mosquito Control
Unit Location AHU-1
Mfg
Model #

**RED TEXT IS INPUT

Estimated SF Served by Unit	2400	SF	
Max Cooling Load	72.0	kbtu/hr	400SF/Ton
Max Heating Load	30.0	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	79	deg F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	3,130.4	btu/h.degF	
Tbal - Cooling	73.8	deg-F	
Ktot - Heating	1000.0	btu/h.degF	
Tbal - Heating	69.3	deg-F	
DX Cooling System	6.5	tons	
	78	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	6.78	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	3	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	11.5	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	88.3	73.1	1.000	73.1	6.78	1.00	0.00	0
97	23.2	0	72.7	76.2	1.000	76.2	6.78	0.85	0.00	0
92	18.2	0	57.0	79.2	1.000	79.2	6.78	0.72	0.00	0
87	13.2	54	41.4	82.3	1.000	82.3	6.78	0.50	2.23	184
82	8.2	643	25.7	85.3	1.000	85.3	6.78	0.30	16.53	1,315
77	3.2	869	10.1	88.3	1.000	88.3	6.78	0.11	8.74	671
72	-1.8	624	-5.6	91.4	1.000	91.4	6.78	-0.06	-3.49	-259
		2,190							24.01	1,911

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.3	165	-7.3	0.0	1.000	0.0	0.00	-625.18	-1.21	0	-7.35	-2.15	355
57	12.3	123	-12.3	0.0	1.000	0.0	0.00	-1,109.11	-1.52	0	-12.34	-3.62	445
52	17.3	80	-17.3	0.0	1.000	0.0	0.00	-1,649.22	-1.39	0	-17.34	-5.08	407
47	22.3	43	-22.3	0.0	1.000	0.0	0.00	-2,255.89	-0.96	0	-22.34	-6.55	282
42	27.3	15	-27.3	0.0	1.000	0.0	0.00	-2,942.23	-0.41	0	-27.34	-8.01	120
37	32.3	5	-32.3	0.0	1.000	0.0	0.00	-3,725.04	-0.16	0	-32.34	-9.48	47
32	37.3	2	-37.3	0.0	1.000	0.0	0.00	-4,626.19	-0.07	0	-37.34	-10.94	22
27	42.3	0	-42.3	0.0	1.000	0.0	0.00	-5,674.71	0.00	0	-42.34	-12.41	0
22	47.3	0	-47.3	0.0	1.000	0.0	0.00	-6,909.98	0.00	0	-47.34	-13.87	0
17	52.3	0	-52.3	0.0	1.000	0.0	0.00	-8,386.75	0.00	0	-52.34	-15.34	0
12	57.3	0	-57.3	0.0	1.000	0.0	0.00	-10,183.54	0.00	0	-57.34	-16.80	0
		433								0			1,677

Total Cooling kW Demand	6.8	kW
Total Cooling kWh Consumption	1,911	kWh
Total Heating kWh Consumption	1,677	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 18 Hour: Proposed Conditions

Facility	Mosquito Control
Unit Location	AHU-1
Mfg	
Model #	

*RED TEXT IS INPUT

Estimated SF Served by Unit	2400	SF	
Max Cooling Load	72.0	kbtu/hr	400SF/Ton
Max Heating Load	96.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	3,130.4	btu/h-degF	
Tbal - Cooling	73.8	deg-F	
Ktot - Heating	-3200.0	btu/h-degF	
Tbal - Heating	69.8	deg-F	
DX Cooling System	6.5	tons	
	78	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	6.78	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	9	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	88.3	73.1	1.000	73.1	6.78	1.00	0.00	0
97	23.2	5	72.7	76.2	1.000	76.2	6.78	0.95	0.36	32
92	18.2	174	57.0	79.2	1.000	79.2	6.78	0.72	9.92	849
87	13.2	787	41.4	82.3	1.000	82.3	6.78	0.50	32.55	2,684
82	8.2	816	25.7	85.3	1.000	85.3	6.78	0.30	20.98	1,660
77	3.2	609	10.1	88.3	1.000	88.3	6.78	0.11	6.13	470
72	-1.8	278	-5.8	91.4	1.000	91.4	6.78	-0.06	-1.56	-115
		2,669							68.39	5,589

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	70	-24.9	0.0	1.000	0.0	0.00	-2,125.60	-1.75	0	-24.95	-7.31	512
57	12.8	34	-40.9	0.0	1.000	0.0	0.00	-3,681.06	-1.39	0	-40.94	-12.00	408
52	17.8	17	-56.9	0.0	1.000	0.0	0.00	-5,417.06	-0.97	0	-56.94	-16.68	284
47	22.8	5	-72.9	0.0	1.000	0.0	0.00	-7,367.00	-0.36	0	-72.94	-21.37	107
42	27.8	2	-88.9	0.0	1.000	0.0	0.00	-9,573.02	-0.18	0	-88.94	-26.06	52
37	32.8	1	-104.9	0.0	1.000	0.0	0.00	-12,089.09	-0.10	0	-104.94	-30.75	31
32	37.8	0	-120.9	0.0	1.000	0.0	0.00	-14,985.54	0.00	0	-120.94	-35.44	0
27	42.8	0	-136.9	0.0	1.000	0.0	0.00	-18,355.67	0.00	0	-136.94	-40.12	0
22	47.8	0	-152.9	0.0	1.000	0.0	0.00	-22,326.03	0.00	0	-152.94	-44.81	0
17	52.8	0	-168.9	0.0	1.000	0.0	0.00	-27,072.65	0.00	0	-168.94	-49.50	0
12	57.8	0	-184.9	0.0	1.000	0.0	0.00	-32,847.94	0.00	0	-184.94	-54.19	0
		129								0			1,393

Total Cooling kW Demand	6.8	kW
Total Cooling kWh Consumption	5,589	kWh
Total Heating kWh Consumption	1,393	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

OPTERRA
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Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	Mosquito Control
Unit Location	AHU-1
Mfg	
Model #	

**RED TEXT IS INPUT

Estimated SF Served by Unit	2400	SF	
Max Cooling Load	72.0	kbtu/hr	400SF/Ton
Max Heating Load	96.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	5		
Average internal heat gain	0.7	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	3,130.4	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-3200.0	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	6.5	tons	
	78	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	6.78	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	9	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	88.3	73.1	1.000	73.1	6.78	1.00	0.00	0
97	23.2	1	72.7	76.2	1.000	76.2	6.78	0.95	0.07	6
92	18.2	11	57.0	79.2	1.000	79.2	6.78	0.72	0.63	54
87	13.2	275	41.4	82.3	1.000	82.3	6.78	0.50	11.37	938
82	8.2	821	25.7	85.3	1.000	85.3	6.78	0.30	21.11	1,679
77	3.2	862	10.1	88.3	1.000	88.3	6.78	0.11	8.67	666
72	-1.8	539	-5.6	91.4	1.000	91.4	6.78	-0.06	-3.02	-224
		2,509							38.84	3,119

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	106	-24.9	0.0	1.000	0.0	0.00	-2,125.60	-2.64	0	-24.95	-7.31	775
57	12.8	60	-40.9	0.0	1.000	0.0	0.00	-3,681.06	-2.46	0	-40.94	-12.00	720
52	17.8	31	-56.9	0.0	1.000	0.0	0.00	-5,417.06	-1.76	0	-56.94	-16.68	517
47	22.8	10	-72.9	0.0	1.000	0.0	0.00	-7,367.00	-0.73	0	-72.94	-21.37	214
42	27.8	3	-88.9	0.0	1.000	0.0	0.00	-9,573.02	-0.27	0	-88.94	-26.06	78
37	32.8	1	-104.9	0.0	1.000	0.0	0.00	-12,089.09	-0.10	0	-104.94	-30.75	31
32	37.8	0	-120.9	0.0	1.000	0.0	0.00	-14,985.54	0.00	0	-120.94	-35.44	0
27	42.8	0	-136.9	0.0	1.000	0.0	0.00	-18,355.67	0.00	0	-136.94	-40.12	0
22	47.8	0	-152.9	0.0	1.000	0.0	0.00	-22,326.03	0.00	0	-152.94	-44.81	0
17	52.8	0	-168.9	0.0	1.000	0.0	0.00	-27,072.65	0.00	0	-168.94	-49.50	0
12	57.8	0	-184.9	0.0	1.000	0.0	0.00	-32,847.94	0.00	0	-184.94	-54.19	0
		211								0			2,334

Total Cooling kW Demand	6.8	kW
Total Cooling kWh Consumption	3,119	kWh
Total Heating kWh Consumption	2,334	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Project: Broward - South Maint Bldg A — Run Date/Time: 10/02/17 @ 13:35

Annual Energy and Demand (pg 1 of 2)

		Ann. Source Energy		Annual Site Energy		Lighting	HVAC Energy			Peak	
		Total Mbtu	EUI kBtu/sf/yr	Elect kWh	Nat Gas Therms	Electric kWh	Electric kWh	Nat Gas Therms	Total Mbtu	Elect kW	Cooling Tons
Annual Energy USE or DEMAND											
0	Base Design	458	143.17	44,744	--	13,670	16,939	--	58	12	5
1	0+TStat Management EEM	443	138.48	43,279	--	13,670	15,474	--	53	13	5
2	1+Pkg HVAC Eff EEM	411	128.41	40,131	--	13,670	12,327	--	42	13	5
3	2+Lay-In Ceiling Insulation	407	127.10	39,724	--	13,670	11,920	--	41	11	5
Incremental SAVINGS	**(values are relative to previous measure (% savings are relative to base case use), negative entries indicate increased use)**										
1	0+TStat Management EEM	15	4.69 (3%)	1,465 (3%)	--	0 (0%)	1,465 (9%)	--	5 (9%)	-1 (-5%)	-0 (-1%)
2	1+Pkg HVAC Eff EEM	32	10.07 (7%)	3,147 (7%)	--	0 (0%)	3,147 (19%)	--	11 (19%)	0 (0%)	0 (0%)
3	2+Lay-In Ceiling Insulation	4	1.30 (1%)	407 (1%)	--	0 (0%)	406 (2%)	--	1 (2%)	2 (15%)	0 (2%)
Cumulative SAVINGS	**(values (and % savings) are relative to the Base Case, negative entries indicate increased use)**										
1	0+TStat Management EEM	15	4.69 (3%)	1,465 (3%)	--	0 (0%)	1,465 (9%)	--	5 (9%)	-1 (-5%)	-0 (-1%)
2	1+Pkg HVAC Eff EEM	47	14.76 (10%)	4,613 (10%)	--	0 (0%)	4,612 (27%)	--	16 (27%)	-1 (-5%)	-0 (-1%)
3	2+Lay-In Ceiling Insulation	51	16.06 (11%)	5,020 (11%)	--	0 (0%)	5,019 (30%)	--	17 (30%)	1 (10%)	0 (1%)

eQUEST 3.65.7173 — Annual Building Summary (2 pgs) — Page 1

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split System - Savings Summary

Facility	South Maintenance
Unit Location	Bldg C

Existing Conditions

Mfg	Goodman
Model #	GSC030361DE
Date Mfg	2007

Baseline Data

Peak kW	
kWh	11,864

Proposed Conditions

Mfg	
Model #	

Energy Usage

Existing Conditions

00-08 Hrs	3.1	kW	1,840	kWh	0	Therms
09-16 Hrs	3.1	kW	3,621	kWh	0	Therms
17-00 Hrs	3.1	kW	2,797	kWh	0	Therms
Total	**3.1**	**kW**	**8,259**	**kWh**	**0**	**Therms**
	#DIV/0!		*69.6%*			

Proposed Conditions

00-08 Hrs	3.1	kW	1,792	kWh	0	Therms
09-16 Hrs	3.1	kW	3,479	kWh	0	Therms
17-00 Hrs	3.1	kW	2,718	kWh	0	Therms
Total	**3.1**	**kW**	**7,989**	**kWh**	**0**	**Therms**
	#DIV/0!		*67.3%*			

Unadjusted Annual Savings		
	0.0	kW
	270	kWh
	0	Therms

Adjusted for BAS	
0.0	**kW**
147	**kWh**

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Existing Conditions

Facility	South Maintenance
Unit Location	Bldg C
Mfg	Goodman
Model #	GSC030361DE

** RED TEXT IS INPUT

Estimated SF Served by Unit	1200	SF	
Max Cooling Load	36.0	kbtu/hr	400SF/Ton
Max Heating Load	15.0	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	2		
Average internal heat gain	0.9	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	1,566.7	btu/h-degF	
Tbal - Cooling	73.8	deg-F	
Ktot - Heating	500.0	btu/h-degF	
Tbal - Heating	69.5	deg-F	
DX Cooling System	3	tons	
	36	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	10	Age of Unit (yrs)	
	3.29	Full Load kW (degraded 0.5% per year)	
Heating System	0	kbtu/hr	
	9999999999.00	COP	
	10	Age of Unit (yrs)	
	0.00	kbtu/hr Input	
Electric Heating Capacity	5.00	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2007		

**Replace Units in Red

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Electric Counsumption (kWh)
102	28.2	0	44.1	33.8	1.000	33.8	3.29	1.00	0
97	23.2	0	36.3	35.2	1.000	35.2	3.29	1.00	0
92	18.2	0	28.4	36.6	1.000	36.6	3.29	0.78	0
87	13.2	54	20.6	38.0	1.000	38.0	3.29	0.54	96
82	8.2	643	12.8	39.4	1.000	39.4	3.29	0.32	687
77	3.2	869	5.0	40.8	1.000	40.8	3.29	0.12	348
72	-1.8	624	-2.9	42.2	1.000	42.2	3.29	-0.07	-139
		2,190							992

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.5	165	-3.7	0.0	1.000	0.0	0.00	-318.27	0	-3.75	-1.10	181
57	12.5	123	-6.2	0.0	1.000	0.0	0.00	-560.55	0	-6.24	-1.83	225
52	17.5	80	-8.7	0.0	1.000	0.0	0.00	-830.95	0	-8.74	-2.56	205
47	22.5	43	-11.2	0.0	1.000	0.0	0.00	-1,134.68	0	-11.24	-3.29	142
42	27.5	15	-13.7	0.0	1.000	0.0	0.00	-1,478.29	0	-13.74	-4.03	60
37	32.5	5	-16.2	0.0	1.000	0.0	0.00	-1,870.20	0	-16.24	-4.76	24
32	37.5	2	-18.7	0.0	1.000	0.0	0.00	-2,321.35	0	-18.74	-5.49	11
27	42.5	0	-21.2	0.0	1.000	0.0	0.00	-2,846.29	0	-21.24	-6.22	0
22	47.5	0	-23.7	0.0	1.000	0.0	0.00	-3,464.72	0	-23.74	-6.96	0
17	52.5	0	-26.2	0.0	1.000	0.0	0.00	-4,204.06	0	-26.24	-7.69	0
12	57.5	0	-28.7	0.0	1.000	0.0	0.00	-5,103.61	0	-28.74	-8.42	0
		433							0			848

Total Cooling kW Demand	3.1	kW
Total Cooling kWh Consumption	992	kWh
Total Heating kWh Consumption	848	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County

Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Existing Conditions

Facility	South Maintenance
Unit Location	Bldg C
Mfg	Goodman
Model #	GSC030361DE

**RED TEXT IS INPUT

Estimated SF Served by Unit	1200	SF	
Max Cooling Load	36.0	kbtu/hr	400SF/Ton
Max Heating Load	48.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.3	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	1,565.2	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-1600.0	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	3	tons	
	36	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	10	Age of Unit (yrs)	
	3.29	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	10	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	5	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	44.1	33.8	1.000	33.8	3.29	1.00	0.00	0
97	23.2	5	36.3	35.2	1.000	35.2	3.29	1.00	0.18	16
92	18.2	174	28.4	36.6	1.000	36.6	3.29	0.78	4.95	445
87	13.2	787	20.6	38.0	1.000	38.0	3.29	0.54	16.22	1,406
82	8.2	816	12.8	39.4	1.000	39.4	3.29	0.32	10.44	872
77	3.2	609	5.0	40.8	1.000	40.8	3.29	0.12	3.02	244
72	-1.8	278	-2.9	42.2	1.000	42.2	3.29	-0.07	-0.80	-62
		2,669							34.01	2,922

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	70	-12.5	0.0	1.000	0.0	0.00	-1,068.49	-8.77	0	-12.55	-3.68	257
57	12.8	34	-20.5	0.0	1.000	0.0	0.00	-1,846.52	-0.70	0	-20.54	-6.02	205
52	17.8	17	-28.5	0.0	1.000	0.0	0.00	-2,714.87	-0.49	0	-28.54	-8.36	142
47	22.8	5	-36.5	0.0	1.000	0.0	0.00	-3,690.24	-0.18	0	-36.54	-10.71	54
42	27.8	2	-44.5	0.0	1.000	0.0	0.00	-4,783.68	-0.09	0	-44.54	-13.05	26
37	32.8	1	-52.5	0.0	1.000	0.0	0.00	-6,052.23	-0.05	0	-52.54	-15.39	15
32	37.8	0	-60.5	0.0	1.000	0.0	0.00	-7,501.03	0.00	0	-60.54	-17.74	0
27	42.8	0	-68.5	0.0	1.000	0.0	0.00	-9,186.77	0.00	0	-68.54	-20.08	0
22	47.8	0	-76.5	0.0	1.000	0.0	0.00	-11,172.75	0.00	0	-76.54	-22.43	0
17	52.8	0	-84.5	0.0	1.000	0.0	0.00	-13,547.01	0.00	0	-84.54	-24.77	0
12	57.8	0	-92.5	0.0	1.000	0.0	0.00	-16,435.76	0.00	0	-92.54	-27.11	0
		129								0			699

Total Cooling kW Demand	3.1	kW
Total Cooling kWh Consumption	2,922	kWh
Total Heating kWh Consumption	699	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101P1 –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Existing Conditions

Facility	South Maintenance
Unit Location	Bldg C
Mfg	Goodman
Model #	GSC030361DE

RED TEXT IS INPUT

Estimated SF Served by Unit	1200	SF	
Max Cooling Load	36.0	kbtu/hr	400SF/Ton
Max Heating Load	48.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	3.3	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	1,565.2	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-1600.0	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	3	tons	
	36	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	10	Age of Unit (yrs)	
	3.29	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	10	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	5	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	44.1	33.8	1.000	33.8	3.29	1.00	0.00	0
97	23.2	1	36.3	35.2	1.000	35.2	3.29	1.00	0.04	3
92	18.2	11	28.4	36.6	1.000	36.6	3.29	0.78	0.31	28
87	13.2	275	20.6	38.0	1.000	38.0	3.29	0.54	5.67	491
82	8.2	821	12.8	39.4	1.000	39.4	3.29	0.32	10.50	878
77	3.2	862	5.0	40.8	1.000	40.8	3.29	0.12	4.28	345
72	-1.8	539	-2.9	42.2	1.000	42.2	3.29	-0.07	-1.54	-120
		2,509							19.25	1,625

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	106	-12.5	0.0	1.000	0.0	0.00	-1,068.49	-1.33	0	-12.55	-3.68	390
57	12.8	60	-20.5	0.0	1.000	0.0	0.00	-1,846.52	-1.23	0	-20.54	-6.02	361
52	17.8	31	-28.5	0.0	1.000	0.0	0.00	-2,714.87	-0.88	0	-28.54	-8.36	259
47	22.8	10	-36.5	0.0	1.000	0.0	0.00	-3,690.24	-0.37	0	-36.54	-10.71	107
42	27.8	3	-44.5	0.0	1.000	0.0	0.00	-4,783.68	-0.13	0	-44.54	-13.05	39
37	32.8	1	-52.5	0.0	1.000	0.0	0.00	-6,052.23	-0.05	0	-52.54	-15.39	15
32	37.8	0	-60.5	0.0	1.000	0.0	0.00	-7,501.03	0.00	0	-60.54	-17.74	0
27	42.8	0	-68.5	0.0	1.000	0.0	0.00	-9,186.77	0.00	0	-68.54	-20.08	0
22	47.8	0	-76.5	0.0	1.000	0.0	0.00	-11,172.75	0.00	0	-76.54	-22.43	0
17	52.8	0	-84.5	0.0	1.000	0.0	0.00	-13,547.01	0.00	0	-84.54	-24.77	0
12	57.8	0	-92.5	0.0	1.000	0.0	0.00	-16,435.76	0.00	0	-92.54	-27.11	0
		211								0			1,172

Total Cooling kW Demand	3.1	kW
Total Cooling kWh Consumption	1,625	kWh
Total Heating kWh Consumption	1,172	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

OPTERRA
An ENGIE company

Broward County

Broward County - RFP No: R1243101PI –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
00 Hour - 08 Hour: Proposed Conditions

Facility South Maintenance
Unit Location Bldg C
Mfg
Model #

**RED TEXT IS INPUT

Estimated SF Served by Unit	1200	SF	
Max Cooling Load	36.0	kbtu/hr	400SF/Ton
Max Heating Load	15.0	kbtu/hr	12.5 MBH/1000SF
Design OA Cooling Temp	97	deg-F	
Design OA Heating Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	0.3	kbtu/hr	
Inside Cooling Design Temp	73	deg F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	1,565.2	btu/h.degF	
Tbal - Cooling	73.8	deg-F	
Ktot - Heating	500.0	btu/h.degF	
Tbal - Heating	69.5	deg-F	
DX Cooling System	3	tons	
	36	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	3.13	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	5	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

TAG	LOCATION	MFG	MODEL	MFG YR	EER	COP
				2017	11.5	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	44.1	33.8	1.000	33.8	3.13	1.00	0.00	0
97	23.2	0	36.3	35.2	1.000	35.2	3.13	1.00	0.00	0
92	18.2	0	28.4	36.6	1.000	36.6	3.13	0.78	0.00	0
87	13.2	54	20.6	38.0	1.000	38.0	3.13	0.54	1.11	92
82	8.2	643	12.8	39.4	1.000	39.4	3.13	0.32	8.22	654
77	3.2	869	5.0	40.8	1.000	40.8	3.13	0.12	4.31	331
72	-1.8	624	-2.9	42.2	1.000	42.2	3.13	-0.07	-1.79	-133
		2,190							11.86	944

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.5	165	-3.7	0.0	1.000	0.0	0.00	-318.27	-0.82	0	-3.75	-1.10	181
57	12.5	123	-6.2	0.0	1.000	0.0	0.00	-560.55	-0.77	0	-6.24	-1.83	225
52	17.5	80	-8.7	0.0	1.000	0.0	0.00	-830.95	-0.70	0	-8.74	-2.56	205
47	22.5	43	-11.2	0.0	1.000	0.0	0.00	-1,134.68	-0.48	0	-11.24	-3.29	142
42	27.5	15	-13.7	0.0	1.000	0.0	0.00	-1,478.29	-0.21	0	-13.74	-4.03	60
37	32.5	5	-16.2	0.0	1.000	0.0	0.00	-1,870.20	-0.08	0	-16.24	-4.76	24
32	37.5	2	-18.7	0.0	1.000	0.0	0.00	-2,321.35	-0.04	0	-18.74	-5.49	11
27	42.5	0	-21.2	0.0	1.000	0.0	0.00	-2,846.29	0.00	0	-21.24	-6.22	0
22	47.5	0	-23.7	0.0	1.000	0.0	0.00	-3,464.72	0.00	0	-23.74	-6.96	0
17	52.5	0	-26.2	0.0	1.000	0.0	0.00	-4,204.06	0.00	0	-26.24	-7.69	0
12	57.5	0	-28.7	0.0	1.000	0.0	0.00	-5,103.61	0.00	0	-28.74	-8.42	0
		433								0			848

Total Cooling kW Demand	3.1	kW
Total Cooling kWh Consumption	944	kWh
Total Heating kWh Consumption	848	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

Split and Packaged DX System - Energy Usage
09 Hour - 16 Hour: Proposed Conditions

Facility	South Maintenance
Unit Location	Bldg C
Mfg	
Model #	

**RED TEXT IS INPUT

Estimated SF Served by Unit	1200	SF	
Max Cooling Load	36.0	kbtu/hr	400SF/Ton
Max Heating Load	48.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	97	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	3.3	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg-F	
Ktot - Cooling	1,565.2	btu/h-degF	
Tbal - Cooling	73.8	deg-F	
Ktot - Heating	-1600.0	btu/h-degF	
Tbal - Heating	69.8	deg-F	
DX Cooling System	3	tons	
	36	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	3.13	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	5	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	44.1	33.8	1.000	33.8	3.13	1.00	0.00	0
97	23.2	5	36.3	35.2	1.000	35.2	3.13	1.00	0.18	16
92	18.2	174	28.4	36.6	1.000	36.6	3.13	0.78	4.95	424
87	13.2	787	20.6	38.0	1.000	38.0	3.13	0.54	16.22	1,338
82	8.2	816	12.8	39.4	1.000	39.4	3.13	0.32	10.44	830
77	3.2	609	5.0	40.8	1.000	40.8	3.13	0.12	3.02	232
72	-1.8	278	-2.9	42.2	1.000	42.2	3.13	-0.07	-0.80	-59
		2,669							34.01	2,780

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Heat Pump Electric Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	70	-12.5	0.0	1.000	0.0	0.00	-1,068.49	-0.88	0	-12.55	-3.68	257
57	12.8	34	-20.5	0.0	1.000	0.0	0.00	-1,846.52	-0.70	0	-20.54	-6.02	205
52	17.8	17	-28.5	0.0	1.000	0.0	0.00	-2,714.87	-0.49	0	-28.54	-8.36	142
47	22.8	5	-36.5	0.0	1.000	0.0	0.00	-3,690.24	-0.18	0	-36.54	-10.71	54
42	27.8	2	-44.5	0.0	1.000	0.0	0.00	-4,783.68	-0.09	0	-44.54	-13.05	26
37	32.8	1	-52.5	0.0	1.000	0.0	0.00	-6,052.23	-0.05	0	-52.54	-15.39	15
32	37.8	0	-60.5	0.0	1.000	0.0	0.00	-7,501.03	0.00	0	-60.54	-17.74	0
27	42.8	0	-68.5	0.0	1.000	0.0	0.00	-9,186.77	0.00	0	-68.54	-20.08	0
22	47.8	0	-76.5	0.0	1.000	0.0	0.00	-11,172.75	0.00	0	-76.54	-22.43	0
17	52.8	0	-84.5	0.0	1.000	0.0	0.00	-13,547.01	0.00	0	-84.54	-24.77	0
12	57.8	0	-92.5	0.0	1.000	0.0	0.00	-16,435.76	0.00	0	-92.54	-27.11	0
		129								0			699

Total Cooling kW Demand	3.1	kW
Total Cooling kWh Consumption	2,780	kWh
Total Heating kWh Consumption	699	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

Broward County
Broward County - RFP No: R1243101Pl –
Consultant Services, Energy Audit and Performance Consultant Services:

OPTERRA
An ENGIE company

Split and Packaged DX System - Energy Usage
17 Hour - 00 Hour: Proposed Conditions

Facility	South Maintenance
Unit Location	Bldg C
Mfg	
Model #	

RED TEXT IS INPUT

Estimated SF Served by Unit	1200	SF	
Max Cooling Load	36.0	kbtu/hr	400SF/Ton
Max Heating Load	48.0	kbtu/hr	50 MBH/1000SF x 0.8 Safety Factor
Design OA Cooling Temp	87	deg-F	
Design OA Cooling Temp	40	deg-F	
Approx # of People in Area	3		
Average internal heat gain	3.3	kbtu/hr	
Inside Cooling Design Temp	74	deg-F	
Inside Heating Design Temp	70	deg F	
Ktot - Cooling	1,565.2	btu/h-degF	
Tbal - Cooling	73.8	deg F	
Ktot - Heating	-1600.0	btu/h-degF	
Tbal - Heating	69.8	deg F	
DX Cooling System	3	tons	
	36	kbtu/hr	
	11.5	New EER/SEER/IPLV	
	1.043	kW/Ton	
	0	Age of Unit (yrs)	
	3.13	Full Load kW (degraded 0.5% per year)	
Heat Pump System	0.01	kbtu/hr	
	9999999999	COP	
	0	Age of Unit (yrs)	
	0.00	kbtu/hr input	
Electric Heating Capacity	5	kW	
Average Electric Cost	0.000	$/kWh	
Average Natural Gas Cost	0.000	$/Therm	

COOLING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	DX Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adjusted DX Capacity (kbtu/hr)	Rated Electric Input (kW)	Cycling Time Fraction	DX Supplied Cooling (MMBtu)	DX Electric Counsumption (kWh)
102	28.2	0	44.1	33.8	1.000	33.8	3.13	1.00	0.00	0
97	23.2	1	36.3	35.2	1.000	35.2	3.13	1.00	0.04	3
92	18.2	11	28.4	36.6	1.000	36.6	3.13	0.78	0.31	27
87	13.2	275	20.6	38.0	1.000	38.0	3.13	0.54	5.67	467
82	8.2	821	12.8	39.4	1.000	39.4	3.13	0.32	10.50	835
77	3.2	862	5.0	40.8	1.000	40.8	3.13	0.12	4.28	328
72	-1.8	539	-2.9	42.2	1.000	42.2	3.13	-0.07	-1.54	-115
		2,509							19.25	1,546

HEATING ENERGY CONSUMPTION

Temp Bin (F)	Temp diff. (F)	Weather Bin Data (Hrs)	Heat Loss Rate (kbtu/hr)	Furnace Capacity (kbtu/hr)	Cycling Capacity Adj. Factor	Adj. Furnace Capacity (kbtu/hr)	Heat Pump Input (kBtu)	Cycling Time Fraction	Heat Pump Supplied Heating (MMBtu)	Furnace Counsumption (Therms)	Required Auxiliary Heat (kbtu/hr)	Required Auxiliary Heat (kW)	Aux Electric Heat Consumption (kWh)
62	7.8	106	-12.5	0.0	1.000	0.0	0.00	-1,068.49	-1.33	0	-12.55	-3.68	390
57	12.8	60	-20.5	0.0	1.000	0.0	0.00	-1,846.52	-1.23	0	-20.54	-6.02	361
52	17.8	31	-28.5	0.0	1.000	0.0	0.00	-2,714.87	-0.88	0	-28.54	-8.36	259
47	22.8	10	-36.5	0.0	1.000	0.0	0.00	-3,690.24	-0.37	0	-36.54	-10.71	107
42	27.8	3	-44.5	0.0	1.000	0.0	0.00	-4,793.68	-0.13	0	-44.54	-13.05	39
37	32.8	1	-52.5	0.0	1.000	0.0	0.00	-6,052.23	-0.05	0	-52.54	-15.39	15
32	37.8	0	-60.5	0.0	1.000	0.0	0.00	-7,501.03	0.00	0	-60.54	-17.74	0
27	42.8	0	-68.5	0.0	1.000	0.0	0.00	-9,186.77	0.00	0	-68.54	-20.08	0
22	47.8	0	-76.5	0.0	1.000	0.0	0.00	-11,172.75	0.00	0	-76.54	-22.43	0
17	52.8	0	-84.5	0.0	1.000	0.0	0.00	-13,547.01	0.00	0	-84.54	-24.77	0
12	57.8	0	-92.5	0.0	1.000	0.0	0.00	-16,435.76	0.00	0	-92.54	-27.11	0
		211								0			1,172

Total Cooling kW Demand	3.1	kW
Total Cooling kWh Consumption	1,546	kWh
Total Heating kWh Consumption	1,172	kWh
Total Heating Therm Consumption	0	Therms
Annual Energy Cost	**$0**	

LIGHTING Savings Calculations

OpTerra ES performed a detailed audit of all existing lighting equipment and lighting controls for the buildings identified in Group B. During the audit and development process, OpTerra ES gathered as much information as possible to limit the number of assumptions and to generate savings calculations that are as accurate as possible. At each individual site, the energy consumption data of the existing lighting equipment was observed and recorded. The power consumption of each fixture was calculated and then multiplied by the annual run hours to calculate annual energy usage. The proposed energy usage was then calculated by multiplying the same annual run hours by the power consumption of the proposed LED products. The total annual energy savings were calculated by subtracting the proposed usage from the existing usage. The lighting database is not presented in this document due to its large size. This section presents savings calculation summary tables for interior lighting, exterior lighting and site totals (interior and exterior lighting combined).

Broward County

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INTERIOR LIGHTING UPGRADES

Site Information				Energy Usage				Energy Savings					Cost Sav.	
Building ID	Exist Fixture Qty	Prop Fixture Qty	Prop Sensor Qty	Existing Energy Usage (kW)	Existing Energy Usage (kWh)	Proposed Energy Usage (kW)	Proposed Energy Usage (kWh)	Energy Savings (kW)	Energy Savings (kWh)	Controls Savings (kWh)	AC Savings (kWh)	Total Savings (kWh)	OpEx Savings ($)	Est. FPL Incentive ($)
BH34	125	125	0	19.0	55,520	6.8	19,382	12.2	36,138	-	417	36,555	$ 607	$ 342
BH35	880	880	82	43.4	289,367	22.0	154,092	21.4	135,274	6,450	10,382	152,106	$ 5,404	$ -
BH36	581	581	71	32.5	166,399	18.0	91,966	14.5	74,434	4,573	5,627	84,634	$ 546	$ -
BH37	189	189	48	15.4	47,596	8.1	23,051	7.3	24,546	2,354	1,701	28,600	$ 511	$ 1,136
BH38	138	138	46	11.6	38,682	4.1	14,514	7.5	24,168	1,201	1,856	27,225	$ 589	$ -
BH39	229	229	0	16.4	55,344	8.1	26,927	8.3	28,417	-	2,056	30,473	$ 1,254	$ -
BH40	8	8	5	0.8	1,600	0.5	973	0.3	626	141	39	806	$ 30	$ -
BL13	1098	1098	60	76.8	285,427	36.8	129,895	40.0	155,532	3,572	11,408	170,512	$ 4,640	$ -
BL14	1260	1260	17	82.7	338,786	34.9	139,016	47.8	199,770	955	13,847	214,571	$ 6,440	$ -
BL15	1241	1241	28	77.4	281,237	29.1	104,126	48.3	177,111	896	12,015	190,021	$ 6,117	$ -
BL16	1355	1355	39	90.3	361,451	36.2	140,918	54.1	220,533	2,949	15,854	239,336	$ 9,747	$ -
BL17	1270	1270	21	75.0	245,810	41.2	135,059	33.8	110,751	3,398	6,963	121,113	$ 6,898	$ -
BL18	264	264	10	25.7	88,863	10.6	35,755	15.1	53,107	832	3,775	57,714	$ 1,414	$ -
BL19	515	515	13	31.2	89,019	17.8	50,369	13.5	38,649	1,052	2,691	42,392	$ 1,386	$ -
BL20	506	506	18	36.9	130,297	12.4	42,499	24.5	87,799	1,566	5,804	95,169	$ 2,565	$ -
BL21	536	536	14	43.8	129,289	13.0	37,631	30.7	91,658	540	6,465	98,662	$ 3,247	$ -
BL22	248	248	0	16.1	54,590	4.1	13,292	12.0	41,297	-	2,801	44,099	$ 1,314	$ -
BL23	244	244	8	12.4	41,461	6.6	21,865	5.9	19,596	456	1,388	21,440	$ 807	$ -
BL24	146	146	12	11.9	38,139	6.6	21,239	5.3	16,900	911	1,229	19,040	$ 413	$ -
BL25	192	192	0	11.1	37,483	5.9	20,057	5.2	17,426	-	1,192	18,618	$ 1,261	$ -
BL26	392	392	28	29.0	86,434	12.8	38,404	16.1	48,031	1,838	3,456	53,324	$ 919	$ -
BL27	157	157	2	10.0	32,039	2.8	8,396	7.2	23,643	80	1,664	25,387	$ 769	$ 1,119
BO28-A	3547	3547	193	201.6	947,802	102.8	487,657	98.8	460,145	7,638	34,999	502,783	$ 16,250	$ -
BO28-B	69	69	0	4.2	27,157	2.3	15,339	1.8	11,818	-	896	12,714	$ 338	$ -
BO28-C	283	283	64	21.6	126,535	11.9	69,890	9.7	56,645	2,261	4,289	63,194	$ 1,371	$ -
BO28-D	442	442	22	23.8	127,670	13.8	73,823	10.0	53,847	1,250	4,099	59,196	$ 2,787	$ -
BO29	1474	1474	287	153.2	504,472	65.8	207,910	87.4	296,561	25,397	10,440	332,398	$ 6,543	$ 6,971
BO30	2869	2869	194	177.2	746,824	102.9	435,703	74.3	311,121	14,486	22,737	348,344	$ 15,207	$ -
BO31	843	843	0	60.7	329,712	35.0	187,869	25.7	141,844	-	9,512	151,356	$ 8,476	$ -
BO32	308	308	0	22.8	67,536	13.1	38,496	9.7	29,040	-	2,033	31,073	$ 827	$ -
BO33	224	224	19	22.9	80,525	8.9	29,374	14.0	51,151	1,239	3,715	56,105	$ 783	$ -
BP1	673	673	0	53.7	143,768	31.2	81,525	22.4	62,243	-	4,770	67,013	$ 891	$ -
BP10	194	194	3	10.6	34,793	4.4	13,761	6.2	21,033	-	1,498	22,531	$ 627	$ -
BP11	43	43	0	2.9	5,882	1.1	2,860	1.8	3,022	-	-	3,022	$ 145	$ -
BP12														
BP2	544	544	19	46.4	137,811	21.1	67,347	25.3	70,463	2,223	4,216	76,902	$ 3,125	$ -
BP3	111	111	0	2.9	7,811	2.5	6,760	0.4	1,051	-	76	1,127	$ 103	$ -
BP4	240	240	25	13.5	40,805	6.7	19,916	6.8	20,890	1,191	1,500	23,581	$ 838	$ -
BP5	316	316	0	18.7	51,659	8.7	23,393	10.1	28,266	-	2,089	30,354	$ 1,066	$ -
BP6	512	512	10	29.1	69,947	11.0	26,109	18.2	43,838	567	2,967	47,372	$ 2,395	$ -
BP7	251	251	1	26.8	25,921	11.3	11,897	15.6	14,025	28	770	14,823	$ 347	$ -
BP8	137	137	0	6.4	19,820	3.4	11,214	2.9	8,606	-	601	9,207	$ 412	$ -
BP9	204	204	5	15.4	36,827	7.6	18,044	7.8	18,783	636	1,433	20,852	$ 637	$ -
BR41	1182	1182	21	275.1	1,507,135	90.3	468,311	184.8	1,038,824	77,394	3,686	1,119,904	$ 8,940	$ -
BR42	125	125	0	19.0	55,520	6.8	19,382	12.2	36,138	-	417	36,555	$ 607	$ 342
BR43	182	182	0	14.2	29,390	8.2	16,936	6.0	12,454	-	910	13,364	$ 340	$ -
BR44	99	99	5	10.1	22,219	5.6	12,757	4.5	9,462	1,001	534	10,997	$ 224	$ -
BR45	53	53	9	5.4	16,020	2.9	8,659	2.5	7,361	1,936	565	9,863	$ 166	$ -
BR46	61	61	0	3.6	11,915	1.6	4,911	2.0	7,003	-	133	7,137	$ 307	$ -
Total	**26,560**	**26560**	**1399**	**2,011**	**8,070,310**	**920**	**3,629,270**	**1,092**	**4,441,040**	**171,009**	**231,515**	**4,843,565**	**130,632**	**$ 9,910**

Broward County

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EXTERIOR LIGHTING UPGRADES

Site Information					Energy Usage				Energy Savings					Cost Savings
Building ID	Column1	Exist Fixture Qty	Prop Fixture Qty	Prop Sensor Qty	Existing Energy Usage (kW)	Existing Energy Usage (kWh)	Proposed Energy Usage (kW)	Proposed Energy Usage (kWh)	Energy Savings (kW)	Energy Savings (kWh)	Controls Savings (kWh)	AC Savings (kWh)	Total Savings (kWh)	OpEx Savings ($)
BH34	Central Homeless Assistance Center	39	39	0	12.6	22,941	2.9	5,365	9.7	17,576	-	-	17,576	$ 224
BH35	Booher building	56	56	0	4.9	21,431	1.4	6,005	3.5	15,426	-	-	15,426	$ 403
BH36	North Homeless Assistance Center	107	107	0	8.5	37,121	2.5	10,911	6.0	26,210	-	-	26,210	$ 1,662
BH37	Family Success Center, N, Pompano	51	51	0	4.9	21,317	1.1	4,849	3.8	16,469	-	-	16,469	$ 457
BH38	Sexual Assault Treatment Center	9	9	0	2.0	8,541	0.4	1,770	1.5	6,771	-	-	6,771	$ 92
BH39	EPD Environmental Mon. Facility & Lab	35	35	0	2.6	11,243	1.1	4,932	1.4	6,312	-	-	6,312	$ 242
BH40	EAP Our House	6	6	0	0.1	394	0.1	394	-	-	-	-	-	$ -
BL13	LIBRARY, AF, African American	138	138	0	24.5	107,240	4.3	18,968	20.2	88,272	-	-	88,272	$ 1,253
BL14	LIBRARY, SW, SW Regional	18	18	0	2.9	12,746	0.6	2,733	2.3	10,013	-	-	10,013	$ 98
BL15	LIBRARY, WR, West Regional	64	64	0	18.8	164,416	6.2	54,286	12.6	110,131	-	-	110,131	$ 1,185
BL16	LIBRARY, NO, North West Regional	78	78	0	20.1	87,968	5.1	22,325	15.0	65,643	-	-	65,643	$ 711
BL17	LIBRARY, WE, Weston	45	45	0	7.4	32,478	2.1	9,242	5.3	23,236	-	-	23,236	$ 394
BL18	LIBRARY, LL, Lauderdale Lakes	39	39	0	6.9	30,091	1.3	5,624	5.6	24,467	-	-	24,467	$ 410
BL19	LIBRARY, SL, Stirling Road	71	71	0	11.1	48,815	2.9	12,549	8.3	36,266	-	-	36,266	$ 690
BL20	LIBRARY, NL, North Lauderdale	30	30	0	4.8	21,169	1.3	5,878	3.5	15,291	-	-	15,291	$ 365
BL21	LIBRARY, SN, Dan Pearl	50	50	0	7.3	32,018	2.9	12,557	4.4	19,460	-	-	19,460	$ 303
BL22	LIBRARY, MG, Margate	25	25	0	4.5	19,876	1.3	5,847	3.2	14,029	-	-	14,029	$ 213
BL23	LIBRARY, HL, Hallandale	23	23	0	4.1	18,072	0.9	3,745	3.3	14,327	-	-	14,327	$ 209
BL24	LIBRARY, CP, Century Plaza	0	0	0	-	-	-	-	-	-	-	-	-	$ -
BL25	LIBRARY, DA, Dania Beach	38	38	0	1.4	6,185	0.6	2,462	0.9	3,723	-	-	3,723	$ 464
BL26	LIBRARY, CR, Carver Ranches	38	38	0	5.1	22,452	1.7	7,238	3.5	15,214	-	-	15,214	$ 238
BL27	LIBRARY, NW, Pompano Branch	24	24	0	4.8	21,015	1.0	4,494	3.8	16,521	-	-	16,521	$ 197
BO28-A	PSC - Public Safety Building	139	139	0	40.4	176,755	8.0	35,250	32.3	141,505	-	-	141,505	$ 1,341
BO28-B	PSC - Logistics Warehouse	2	2	0	0.6	2,584	0.2	718	0.4	1,866	-	-	1,866	$ 20
BO28-C	PSC - Inventory & Evidence Warehse	6	6	0	1.6	6,964	0.4	1,918	1.2	5,046	-	-	5,046	$ 59
BO28-D	PSC - BSO District 5 Office	5	5	0	1.0	4,490	0.3	1,205	0.7	3,285	-	-	3,285	$ 49
BO29	North Regional Courthouse	47	47	0	12.6	55,363	2.8	12,054	9.9	43,309	-	-	43,309	$ 463
BO30	Government Center West	228	228	0	47.9	300,034	11.6	72,883	36.3	227,151	-	-	227,151	$ 3,211
BO31	TRAF ENGN Administration North	48	48	0	7.1	30,932	6.9	30,091	0.2	841	-	-	841	$ 33
BO32	PARK Administration Complex	13	13	0	1.4	6,132	0.5	2,400	0.9	3,732	-	-	3,732	$ 115
BO33	INTEG WAST South Landfill	64	64	0	7.8	34,238	1.4	6,082	6.4	28,157	-	-	28,157	$ 615
BP1	CD REGIONAL	469	469	0	125.0	318,426	30.1	75,945	94.9	242,481	-	-	242,481	$ 2,514
BP2	TOPEEKEEGEE YUGNEE	75	75	0	4.5	10,322	1.7	3,392	2.8	6,930	-	-	6,930	$ 299
BP3	EASTERLIN	53	53	0	3.1	13,753	0.9	4,087	2.2	9,667	-	-	9,667	$ 460
BP4	TREE TOPS	104	104	0	22.6	43,536	7.2	13,658	15.4	29,878	-	-	29,878	$ 622
BP5	LONG KEY	115	115	0	21.0	21,252	1.1	1,397	19.9	19,856	-	-	19,856	$ 245
BP6	WEST LAKE / Anne Kolb NC	151	151	0	21.6	60,595	4.4	12,045	17.1	48,550	-	-	48,550	$ 1,205
BP7	BRIAN PICCOLO	160	160	0	55.5	34,616	11.3	7,063	44.2	27,553	-	-	27,553	$ 185
BP8	FERN FOREST	44	44	0	0.7	2,891	0.4	1,831	0.2	1,060	-	-	1,060	$ 128
BP9	PLANTATION HERITAGE	102	102	0	18.0	36,095	4.8	9,714	13.1	26,381	-	-	26,381	$ 420
BP10	SECRET WOODS	28	28	0	4.4	9,537	0.3	736	4.0	8,802	-	-	8,802	$ 138
BP11	HOLLYWOOD NORTH BEACH	43	43	0	6.7	25,703	6.7	25,703	-	-	-	-	-	$ -
BP12	SAW PALMETTO	0	0	0	-	-	-	-			-	-		$ -
BR41	MASS TRAN, North Maintenance	160	160	0	43.8	191,660	15.8	69,296	27.9	122,364	-	-	122,364	$ 1,291
BR42	BSO Maintenance Facility	39	39	0	12.6	22,941	2.9	5,365	9.7	17,576	-	-	17,576	$ 224
BR43	BCJC South Parking Garage	654	654	0	67.1	489,964	32.2	231,623	34.9	258,341	-	-	258,341	$ 4,315
BR44	HIGH & BRDG Mosquito Control	37	37	0	5.3	23,131	1.7	7,547	3.6	15,584	-	-	15,584	$ 251
BR45	South Maintenance Shop	13	13	0	1.6	6,842	0.3	1,345	1.3	5,497	-	-	5,497	$ 79
BR46	MASS TRAN Northeast Terminal	123	123	0	16.2	70,921	3.1	13,657	13.1	57,264	-	-	57,264	$ 922
Total		**3,906**	**3,906**	**-**	**709.0**	**2,747,207**	**198.9**	**849,177**	**510.1**	**1,898,031**	**-**	**-**	**1,898,031**	**29,014**

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Site Totals (Interior and Exterior)

Site	Energy Usage				Energy Savings				
Building ID	Existing Energy Usage (kW)	Existing Energy Usage (kWh)	Proposed Energy Usage (kW)	Proposed Energy Usage (kWh)	Energy Savings (kW)	Energy Savings (kWh)	Controls Savings (kWh)	AC Savings (kWh)	Total Savings (kWh)
BH34	31.6	78,461	9.7	24,748	21.8	53,713	-	417	54,130
BH35	48.3	310,798	23.4	160,097	24.9	150,701	6,450	10,382	167,533
BH36	41.0	203,520	20.5	102,876	20.5	100,644	4,573	5,627	110,844
BH37	20.3	68,914	9.2	27,899	11.0	41,014	2,354	1,701	45,069
BH38	13.6	47,223	4.5	16,284	9.1	30,939	1,201	1,856	33,996
BH39	18.9	66,587	9.2	31,859	9.8	34,728	-	2,056	36,784
BH40	0.9	1,994	0.6	1,368	0.3	626	141	39	806
BL13	101.3	392,667	41.1	148,862	60.2	243,804	3,572	11,408	258,784
BL14	85.6	351,532	35.6	141,749	50.1	209,782	955	13,847	224,584
BL15	96.2	445,653	35.3	158,412	60.9	287,242	896	12,015	300,152
BL16	110.4	449,419	41.3	163,243	69.1	286,176	2,949	15,854	304,979
BL17	82.4	278,288	43.4	144,301	39.1	133,987	3,398	6,963	144,348
BL18	32.6	118,953	11.9	41,379	20.7	77,574	832	3,775	82,181
BL19	42.4	137,834	20.6	62,918	21.8	74,916	1,052	2,691	78,658
BL20	41.8	151,466	13.8	48,377	28.0	103,089	1,566	5,804	110,459
BL21	51.1	161,307	15.9	50,188	35.2	111,118	540	6,465	118,123
BL22	20.6	74,466	5.5	19,140	15.2	55,326	-	2,801	58,128
BL23	16.6	59,533	7.4	25,610	9.2	33,923	456	1,388	35,767
BL24	11.9	38,139	6.6	21,239	5.3	16,900	911	1,229	19,040
BL25	12.5	43,667	6.5	22,518	6.0	21,149	-	1,192	22,341
BL26	34.1	108,886	14.5	45,642	19.6	63,245	1,838	3,456	68,538
BL27	14.8	53,054	3.8	12,890	11.0	40,164	80	1,664	41,908
BO28-A	242.0	1,124,557	110.9	522,907	131.1	601,650	7,638	34,999	644,288
BO28-B	4.7	29,741	2.5	16,058	2.2	13,684	-	896	14,580
BO28-C	23.2	133,499	12.3	71,808	10.8	61,691	2,261	4,289	68,240
BO28-D	24.9	132,160	14.1	75,027	10.8	57,132	1,250	4,099	62,481
BO29	165.8	559,835	68.6	219,964	97.3	339,871	25,397	10,440	375,708
BO30	225.1	1,046,858	114.5	508,586	110.6	538,272	14,486	22,737	575,495
BO31	67.8	360,644	41.9	217,959	25.9	142,684	-	9,512	152,197
BO32	24.2	73,668	13.7	40,896	10.5	32,772	-	2,033	34,805
BO33	30.7	114,764	10.3	35,456	20.4	79,308	1,239	3,715	84,262
BP1	178.6	462,194	61.3	157,471	117.3	304,724	-	4,770	309,494
BP10	14.9	44,331	4.7	14,497	10.2	29,834	-	1,498	31,332
BP11	9.7	31,585	7.8	28,563	1.8	3,022	-	-	3,022
BP12									
BP2	50.8	148,133	22.7	70,740	28.1	77,393	2,223	4,216	83,832
BP3	6.0	21,565	3.4	10,847	2.6	10,718	-	76	10,794
BP4	36.1	84,341	13.9	33,574	22.2	50,768	1,191	1,500	53,459
BP5	39.8	72,911	9.8	24,790	30.0	48,121	-	2,089	50,210
BP6	50.7	130,542	15.4	38,154	35.3	92,388	567	2,967	95,922
BP7	82.3	60,538	22.6	18,960	59.7	41,578	28	770	42,376
BP8	7.0	22,711	3.9	13,045	3.2	9,666	-	601	10,267
BP9	33.4	72,922	12.4	27,758	21.0	45,163	636	1,433	47,233
BR41	318.8	1,698,795	106.1	537,607	212.7	1,161,188	77,394	3,686	1,242,268
BR42	31.6	78,461	9.7	24,748	21.8	53,713	-	417	54,130
BR43	81.3	519,354	40.4	248,559	40.9	270,795	-	910	271,705
BR44	15.4	45,350	7.4	20,304	8.0	25,046	1,001	534	26,581
BR45	6.9	22,862	3.2	10,004	3.7	12,858	1,936	565	15,360
BR46	19.8	82,836	4.8	18,568	15.1	64,267	-	133	64,401
Total	**2,720.4**	**10,817,518**	**1,118.5**	**4,478,447**	**1,601.9**	**6,339,071**	**171,009**	**231,515**	**6,741,595**

WATER ECM Calculations

- W1 Plumbing Fixture Upgrades
- W2 Install Refrigeration Line Heat Exchanger on Ice Machines
- W3 Central Control Weather Based Irrigation

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Demographics and Usage

Count	1	3	4	5	7
Bldg #	1	3	4	5	7
Building Name	**North Regional Courthouse**	**MASS TRAN, North Maintenance**	**Government Center West**	**CD REGIONAL**	**Public Safety complex**
Category	Office BLDG	Maintenance	Office BLDG	Park & Rec	Office BLDG
Per Square Foot Per Person Allocation Business	250	2000	250	750	250
Per Day Visitor for Park / Recreation	250	5	250	600	250
Square Footage	200,000.00	195,189.00	184,820.00	50,516.00	300,720.00
Sale Tax%	6.00%	6.00%	6.00%	6.00%	6.00%
Population Group 1 — <2hr (Visitor)					
Ave hrs/day ON	<2hr (Visitor)	<2hr (Visitor)	<2hr (Visitor)	<2hr (Visitor)	<2hr (Visitor)
P1 Ave Daily Count	225	5	225	540	225
M-F days/yr possible ON	261	261	261	261	261
Sat/Sun days/yr expected ON	104	104	104	104	104
Holiday/vacation days/yr OFF	10	10	10	10	10
% Male	50%	50%	50%	50%	50%
MALE count	112.5	2.3	112.5	270.0	112.5
FEMALE	112.5	2.3	112.5	270.0	112.5
Group Occupancy Days	355.0	355.0	355.0	355.0	355.0
Group Water Closet Use per day	84.4	1.7	84.4	202.5	84.4
Group Urinal Use per day	28.1	0.6	28.1	67.5	28.1
Group Faucet Use per day	33.8	0.7	33.8	81.0	33.8
Group Total Shower Use per day					
Population Group 2 — Visitor <4hrs					
Ave hrs/day ON	Visitor <4hrs	Visitor <4hrs	Visitor <4hrs	Visitor <4hrs	Visitor <4hrs
P1 Ave Daily Count	25	1	25	60	25
M-F days/yr ON	261	261	261	261	261
Sat/Sun days/yr ON	104	104	104	104	104
Holiday/vacation days/yr OFF	10	10	10	10	10
% Male	50%	50%	50%	50%	50%
MALE count	12.5	0.3	12.5	30.0	12.5
FEMALE	12.5	0.3	12.5	30.0	12.5
Group Occupancy Days	355.0	355.0	355.0	355.0	355.0
Group Water Closet Use per day	18.8	0.4	18.8	45.0	18.8
Group Urinal Use per day	6.3	0.1	6.3	15.0	6.3
Group Faucet Use per day	7.5	0.2	7.5	18.0	7.5
Group Total Shower Use per day					
Population Group 3 — 8 hr Regular / Staff					
Ave hrs/day ON	8 hr Regular / Staff	8 hr Regular / Staff	8 hr Regular / Staff	8 hr Regular / Staff	8 hr Regular / Staff
P1 Ave Daily Count	800.0	97.6	739.3	67.4	1202.9
M-F days/yr ON	261	261	261	261	261
Sat/Sun days/yr ON	104	104	104	104	104
Holiday/vacation days/yr OFF	30	30	30	30	30
% Male	50%	50%	50%	50%	50%
MALE count	400.0	48.8	369.6	33.7	601.4
FEMALE	400.0	48.8	369.6	33.7	601.4
Group Occupancy Days	335.0	335.0	335.0	335.0	335.0
Group Water Closet Use per day	1400.0	170.8	1293.7	117.9	2105.0
Group Urinal Use per day	600.0	73.2	554.5	50.5	902.2
Group Faucet Use per day	480.0	58.6	443.6	40.4	721.7
Group Total Shower Use per day	40.0	4.9	37.0	3.4	60.1
TOTAL POPULATION	1050.0	102.6	989.3	667.4	1452.9
Occupancy Days	339.8	336.0	340.1	353.0	338.4
Total Water Closet Use per day	1503.1	172.9	1396.9	365.4	2208.2
Total Urinal Use per day	634.4	73.9	588.8	133.0	936.5
Total Faucet Use per day	521.3	59.4	484.8	139.4	763.0
Total Shower Use per day	40.0	4.9	37.0	3.4	60.1

Population Group 1 — <2hr (Visitor)

WATER CLOSET USE daily per person (flush)	URINAL USE daily per person (flush)	FAUCET USE daily per person (min)	SHOWER USE daily per person (min)
0.25	0.25	0.15	
0.50		0.15	

Population Group 2 — Visitor <4hrs

WATER CLOSET USE daily per person (flush)	URINAL USE daily per person (flush)	FAUCET USE daily per person (min)	SHOWER USE daily per person (min)
0.5	0.5	0.3	
1.0		0.3	

Population Group 3 — 8 hr Regular / Staff

WATER CLOSET USE daily per person (flush)	URINAL USE daily per person (flush)	FAUCET USE daily per person (min)	SHOWER USE daily per person (min)
1.0	1.5	0.6	0.1
2.5		0.6	0.1

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Domestic Water Savings Calculations

1 North Regional Courthouse

Facility Days/yr occupation	
	339.76
WC	1503.1
UV	634.4
FC	521.3
SH	40.0

Water/Sewer Combined rate	Actual Consumption
$ 8.59	2,876,805

A

Electric Rate (kwh)	Allocated Calc
$ 0.1000	
Gas rate (therm)	2,675,428
$ 0.8800	

B

Steam (klb)			
Fuel	$ 10.00	$ 10.50
Chem	$ 0.50	

Cls	SC	Fixture Retrofit	pre flow	post flow	Δ flow	% Δ	Quantity	Avg Daily Usage	Gallons Saved Per use	Days Per Year Occupation	Pre Gallons Consumed per yr	Post Gallons consumed per yr	W/S rate	Annual Savings	Monthly Savings
WC	WC	STANDARD > LC	3.80	2.40	1.40	37%	0	-	1.4	339.76	-	-	$ 8.59	$ -	$ -
WC	WC	STANDARD > HE	3.80	1.28	2.52	66%	34	39.6	2.52	339.76	1,736,396	584,891	$ 8.59	$ 9,888.54	$ 824.05
WC	WC	LC > HE	2.20	1.28	0.92	42%	0	-	0.92	339.76	-	-	$ 8.59	$ -	$ -
WC	NA	LC WC > no retrofit	1.28	1.28	0.00	0%	0	-	0	339.76	-	-	$ 8.59	$ -	$ -
WC	TT	TT > HETT	3.50	1.00	2.50	71%	0	-	2.5	339.76	-	-	$ 8.59	$ -	$ -
WC	TT	LC TT > HETT	1.60	1.00	0.60	38%	0	-	0.6	339.76	-	-	$ 8.59	$ -	$ -
WC	TT	LC TT > no retrofit	1.00	1.00	0.00	0%	0	-	0	339.76	-	-	$ 8.59	$ -	$ -
U	U	STANDARD U > PINT	1.50	0.13	1.38	92%	0	-	1.375	339.76	-	-	$ 8.59	$ -	$ -
U	U	STANDARD U > PINT	1.00	0.13	0.88	88%	4	39.6	0.875	339.76	53,758	6,720	$ 8.59	$ 403.94	$ 33.66
U	U	STANDARD U > PINT	0.50	0.13	0.38	75%	0	-	0.375	339.76	-	-	$ 8.59	$ -	$ -
U	U	UV LC > no retrofit	0.13	0.13	0.00	0%	0	-	0	339.76	-	-	$ 8.59	$ -	$ -
U	NA	UV STL > LCV	1.50	0.50	1.00	67%	0	-	1	339.76	-	-	$ 8.59	$ -	$ -
FC	AER	LAV AER	2.50	1.50	1.00	40%	8	13.72	1	339.76	93,211	55,927	$ 8.59	$ 320.18	$ 26.68
FC	AER	LAV AER	2.20	0.50	1.70	77%	30	13.72	1.7	339.76	307,596	69,908	$ 8.59	$ 2,041.15	$ 170.10
FC	FC	LAV AER	1.50	0.50	1.00	67%	0	-	1	339.76	-	-	$ 8.59	$ -	$ -
FC	NA	LAV AER	0.50	0.50	0.00	0%	0	-	0	339.76	-	-	$ 8.59	$ -	$ -
PF	LK	Minor Leak	0.03	0.00	0.03	100%			0.025	339.76	-	-	$ 8.59	$ -	$ -
PF	LK	Major Leak	5.00	0.00	5.00	100%			5	339.76	-	-	$ 8.59	$ -	$ -
SH	SH	SHOWER	2.50	1.50	1.00	40%	0	-	1	339.76	-	-	$ 8.59	$ -	$ -
SH	NA	LC SHOWER > no retrofit	1.50	1.50	0.00	0%	0	-	0	339.76	-	-	$ 8.59	$ -	$ -
											2,190,961	717,446		$ 12,653.81	$ 1,054.48
											C	33%			

B. Hot Water Savings

HWH QTY	%/Gal	Gas, Electric, Steam (G,E,S)	Make/Model	Combined Size (gal)	Make-up temp	Hot water temp	HWH efficiency
1	120.00	e		120.00	65°	120°	80%
				-			
				-			
				-			
				-			
				-			
				-			
				-			
				-			
				-			
				-			
				-			
				-			
				-			
			GAS	0.00			
			ELECTRIC	120.00	65°	120°	80%
			STEAM	0.00			
				(default:65mu, 130hw)		(default:77%gas, 80%elec)	

		ELECTRIC	GAS	STEAM
Total HWH gallons:		120.00		
Percentage:		100%		
Total usage before:	gal/yr	400807	0	0
Total usage after:	gal/yr	125835		
HW Heater efficiency:		80%		
Make-up Water Temp:		65°		
Hot Water Supply Temp:		120°		
Hot Water of Total Fixture Flow:		35%	35%	35%
Cost of Energy:		$0.10	$0.88	$10.50
		per kwh	*per therm*	*per klbh*
Current BTU usage		80,338,062	0	0
Conversion:		23,545.74	0.00	0.00
HW SAVINGS CALCULATION:				
Total Water saved:	gal/yr	274,972	0	0
Hot Water saved:	gal/yr	96,240	0	0
BTU		55,115,648	0	0
Conversion:		16,153.47	0.00	0.00
Energy Savings:		16153.5		
$ Saved:		**$1,615.35**	**$0.00**	**$0.00**

Total Hot Water Savings: **$1,615.35**

C. Operational/Deferred Maintenance Savings

Plumbing	Qty Fixture	Repair	Replace	Total Cost
Water Closets - China				
Toilet Replacement	34	N/A	$178.50	$178.50
Tank Toilets	-	N/A	$0.00	$0.00
Water Closets - Flush Valve				
Flush Valves -	34	$46.24	$127.50	$173.74
Urinals				
Flush Valves -	-	$0.00	$0.00	$0.00
Faucets				
Faucets	-	$0.00	$0.00	$0.00
Aerators	38	N/A	$20.90	$20.90
One Year Total				$373.14

Toilet and Urinal	% in need of repair	Parts Cost	Misc Cost
Flush Valve Repair	8%	$ 12.00	$ 5.00
Flush Valve Replacement	5%	$ 70.00	$ 5.00
China Replacement	5%	$ 100.00	$ 5.00
Faucet			
Faucet Repair	5%	$ 6.00	$ 5.00
Faucet Replacement	5%	$ 60.00	$ 5.00
Aerator Replacement	5%	$ 6.00	$ 5.00

Total Operational Savings: **$373.14**

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Ice Machine Measures

Broward County Facilities Ice Machine Measures

• GENERAL SPECS refrigeration line heat exchanger

With a refrigeration line heat exchanger system installed, the ice machine had to work less to produce more ice. The refrigeration line heat exchanger system lowered the temperature of the incoming water by 13.8°F. This drop in temperature improved the efficiency of the ice machine by more than 18%, as its cycle time dropped from 16 minutes to 13 minutes.

- Lowers incoming water temperature
- Shortens ice making cycle times which produces more ice
- Optimizes ice availability in the bin
- Potentially eliminates the need to buy additional bags of ice
- Saves electricity by filling the bin faster and allowing the ice machine to shut off
- Models available for all types of ice machines
- Extends the life of the ice machine by lowering compressor head pressure
- Reduces air conditioning costs (for air-cooled ice machines)
- 99% Maintenance free utilizing patented anti-mineralization technology
- Delivers performance when you need it the most

•• SAVINGS CALCULATIONS refrigeration line heat exchanger

Broward County Facilities		Bldg	CD REGIONAL	LONG KEY
		Model:		
Site Specific				
KWH rate for location (+ fuel charge)			$ 0.100	$ 0.100
Ice Machine Run Time (% per day)			80%	80%
Ice Machine(s)				
Ice Machine Count			2	1
ARI* rated ice production (lbs. / 24 hrs)			500	800
ARI* rated KWH usage (KWH / 100 lbs.)			5	5
Maximicer Info				
Observed energy savings studies				
Manitowoc, Hoshizaki		15 to 20%		
All others		25 to 30%		
	Selected Savings rate:		15%	15%
Per Unit Energy Usage (daily)				
		Current Kw/h	20	32
		With Maximicer	17	27.2
Per Unit Pre Energy Cost				
		Daily	$ 2.00	$ 3.20
		Monthly	$ 60.00	$ 96.00
		Yearly	$ 730.00	$ 1,168.00
		3 years	$ 2,190.00	$ 3,504.00
Per Unit Post Energy Cost (w/maximicer)				
		Daily	$ 1.70	$ 2.72
		Monthly	$ 51.00	$ 81.60
		Yearly	$ 620.50	$ 992.80
		3 years	$ 1,861.50	$ 2,978.40
Summary				
		SAVINGS:	$ 219.00	$ 175.20

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

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Irrigation Measures

General

WeatherTRAK LC Central Configurations

Desired Configuration	Specify Model	Includes Base Unit	Includes Station Keys
WTPRO3-C-12-CWM	WTPRO3-C-12	WTLC-C-Base06-PL	No station keys included
WTPRO3-C-18-CWM	WTPRO3-C-18	WTLC-C-Base06-PL	One WTLC-6STA-KEY
WTPRO3-C-24-CWM	WTPRO3-C-24	WTLC-C-Base06-PL	Two WTLC-6STA-KEY
WTPRO3-C-30-CWM	WTPRO3-C-30	WTLC-C-Base06-PL	No station keys included
WTPRO3-C-36-CWM	WTPRO3-C-36	WTLC-C-Base06-PL	One WTLC-6STA-KEY
WTPRO3-C-48-CWM	WTPRO3-C-48	WTLC-C-Base06-PL	Two WTLC-6STA-KEY

WeatherTRAK LC Central Options and Accessories

Accessory	Model	Description
6 Station Key	WTLC-6STA-KEY	Enables additional 6 stations up to 18 total stations
Flow Option	WTLC-FLOW-KEY	Provides catastrophic and station based flow for WeatherTRAK LC Central Controlle
Wireless Rain Sensor	WT-WRS	500' range, 5 year battery life

Calculations

Existing System	1	5	7	
Building	North Regional Courthouse	CD REGIONAL	Public Safety complex	EPD Environmental Monitoring Facility & Laboratory
Meter #				
Assumptions/Inputs				
Number of Controllers	1	1	1	1
Number of Stations	12	12	12	8
Controller				
Location	outside (WM)	outside (WM)	outside (WM)	outside (WM)
Rain Sensor	no	no	no	no
Submeter	no	no	no	no
Sewer Deduct	no	no	no	no
Water Costs: KGAL	$ 4.73	$ 4.73	$ 4.73	$ 4.73
Zones on Well:				
Zones on City Water	12	12	12	8
Watering Days/Wk	3.5	3.5	3.5	3.5
Watering wks/yr	36	36	36	36
Watering Min/Zone	20	20	20	20
Heads Per Zone	10	10	10	10
Heads GPM	2.10	2.10	2.10	2.10
Total Calc'd Annual Usage	635.04	635.04	635.04	423.36
	635.04	635.04	635.04	423.36
Savings				
Actual Billed Consumption	635,040.00	635,040.00	635,040.00	423,360.00
kgal	635.04	635.04	635.04	423.36
Balance Check				
Smart Irrigation Saving	25.00%	25.00%	25.00%	25.00%
Consumption post (gal)	476,280.00	476,280.00	476,280.00	317,520.00
Consumption Savings kgal	158.76	158.76	158.76	105.84
Estimated Consumption Savings	$ 750.54	$ 750.54	$ 750.54	$ 500.36
Annual Material Savings	$ 50.00	$ 50.00	$ 50.00	$ 50.00
Annual Plant / Tree Replacement	$ 25.00	$ 25.00	$ 25.00	$ 25.00
Annual Overtime Hours	$ -	$ -	$ -	$ -
Annual Overtime Fuel	$ 540.00	$ 540.00	$ 540.00	$ 540.00
Total Savings	$ 1,365.54	$ 1,365.54	$ 1,365.54	$ 1,115.36
Proposed System				
Number of Controllers	1	1	1	1
Number of Stations (6,12 or 18)	12	12	12	8
Controller	WTPRO3-C-12	WTPRO3-C-12	WTPRO3-C-12	
Accessory	FO	FO	FO	FO
Accessory	RS	RS	RS	RS

Total Irrigation Measure

	North Regional Courthouse	CD REGIONAL	Public Safety complex	EPD Environmental Monitoring Facility & Laboratory
Savings:	$ 1,365.54	$ 1,365.54	$ 1,365.54	$ 1,115.36

ENVELOPE ECM Calculations

- B1 Seal Building Envelope

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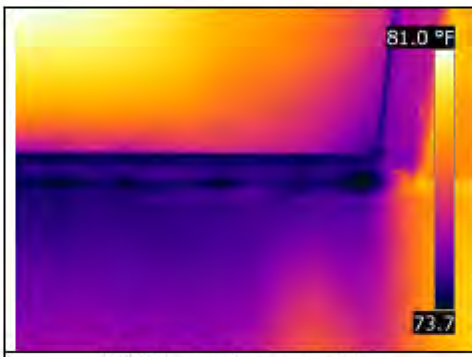
Data Collection

3. *BCJC South Parking BR43*

612 - 644 South Andrews Ave

BCJC South Parking Garage is a five story, 14,397 sq/ft building with a concrete exterior finish. The building appears to have single pane windows, in good condition. We recommend resealing the ineffective areas of sealant on the window box to wall. The largest area of infiltration/ex-filtration was at the doors on all sides of the building. These doors would benefit from new sweeps and weather strip to reduce air and moisture infiltration and ex-filtration leading to energy loss.

BCJC South Parking BR43



"D1" Energy loss around door

"D1" Recommend weather strip & sweep

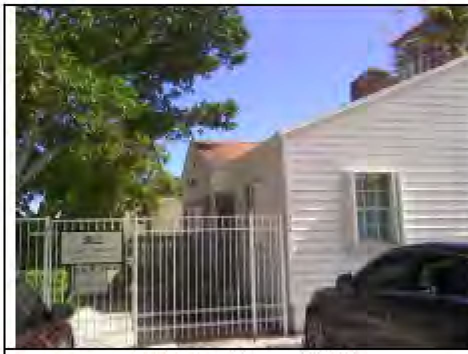
"W1" Energy loss around windows

"W1" Recommend sealant

5. EAP Our House BH40

408 NE 4th Street

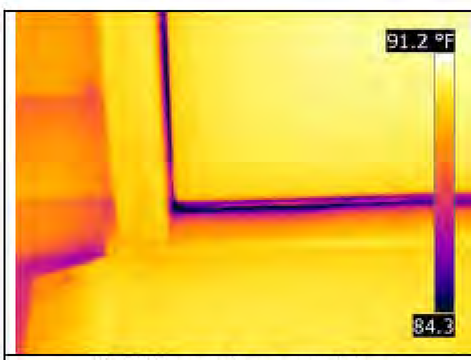
EAP Our House BH40 is a single story 1,127 sq/ft building with a wood siding exterior. The largest area of infiltration/ex-filtration was at the doors on all sides of the buildings. These doors would benefit from new sweeps and weather strip. We recommend sealing penetrations to reduce air and moisture infiltration and ex-filtration leading to energy loss. The windows are single pane, double hung and in good condition.



EAP Our House BH40

"A" Recommend sealant

"B, C" Recommend sealant



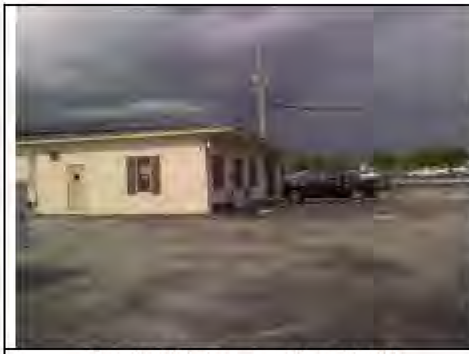
"D2" Energy loss around door

"D2" Recommend weather strip & door sweep

6. South Maintenance Shop BR45

8500 Griffin Road

South Maintenance Shop BR45 is a one story 6,024 sq/ft building, with a concrete exterior finish. The largest area of infiltration /ex-filtration was at the doors on all sides of the building. The doors would benefit from new sweeps, astragals and weather strip. We recommend sealing around penetrations to reduce further air and moisture infiltration and/or ex-filtration.



South Maintenance Shop BR45

"B" Recommend sealant

"D1" Recommend weather strip & door sweeps

"D1" Recommend weather strip, astragal & door sweeps

7. *Tree Tops BP 4*

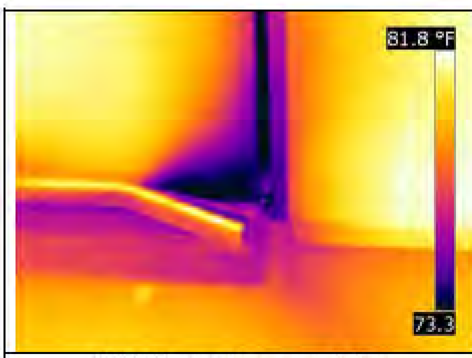
3900 S.W. 100th Avenue

Tree Tops BP 4 is a single story 26,103 sq/ft building, with a wood exterior finish. The single pane, tinted windows appear to be in good condition. We recommend sealing penetrations to reduce air and moisture infiltration and ex-filtration. The doors would benefit from new sweeps, weather strip and astragals where needed.

Tree Tops BP 4

"D1" Energy loss around door

"D1" Recommend weather strip, astragal and door sweeps



"D7" Energy loss around door

"D7" Recommend weather strip and door sweeps

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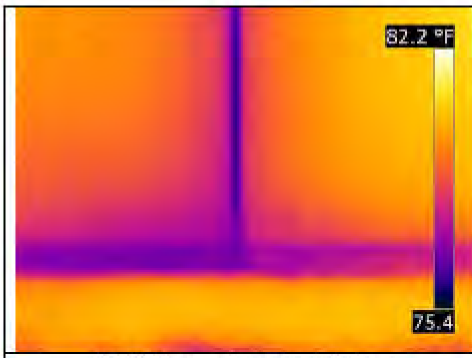
8. *Long Key BP5*

3501 SW 130th Avenue

The Long Key Park BP5 is a two story, 25,591 sq/ft building, with a stucco exterior finish. The windows are single pane with aluminum frames and in good condition and well-sealed. The largest area of infiltration/ex-filtration was around the doors on all sides of the building. The doors would benefit from new sweeps, astragals and weather strip to reduce energy loss. We recommend sealing penetrations to reduce air infiltration/ex-filtration and energy loss.

Long Key BP5



"D5" Energy loss around door

"D5" Recommend weather strip, astragal and door sweeps

"D4" Energy loss around door

"D4" Recommend weather strip and door sweeps

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9. *Brian Piccolo BP 7*

9501 Sheridan Street

Brian Piccolo BP 7 is a one story 11,706 sq/ft building, with a stucco exterior finish. The largest area of infiltration/ex-filtration was at the doors on all sides of the building. These doors would benefit from new sweeps, weather strip and astragals to reduce air and moisture infiltration/ex-filtration. The windows are single pane, tinted and in good condition; however, a few require sealant around the perimeter to reduce energy loss.

Brian Piccolo BP 7

"D3" Energy loss around doors

"D3" Recommend weather strip and door sweep

"W1" Recommend sealant

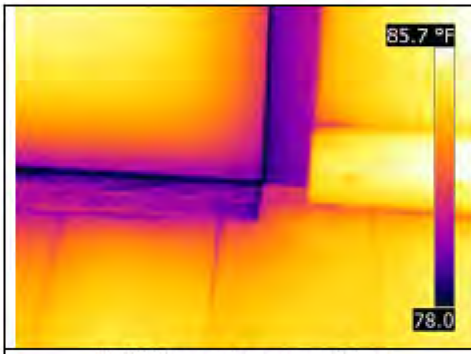
"D1" Recommend weather strip, astragal and door sweep

16. Fern Forest Nature Preserve BP8

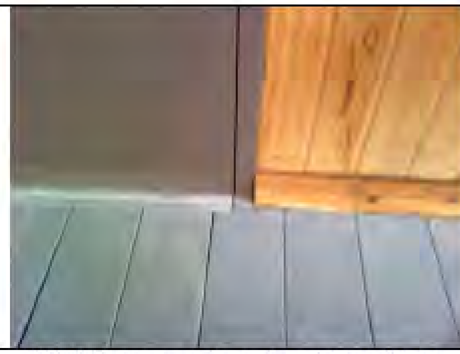
4800 SW 4 ST

Fern Forest Nature Preserve BP8 is a two story 9,893 sq/ft building with a wood exterior finish. The doors would benefit from new sweeps, weather strip and astragals where needed. The single pane, tinted windows appear to be in good condition, however areas of sealant are worn, deteriorated and no longer effective. To maximize energy savings, these areas should be sealed around the perimeter of the window box. Our team also noted penetrations that would benefit from sealant to reduce unwanted air and moisture infiltration/ex-filtration and energy loss.

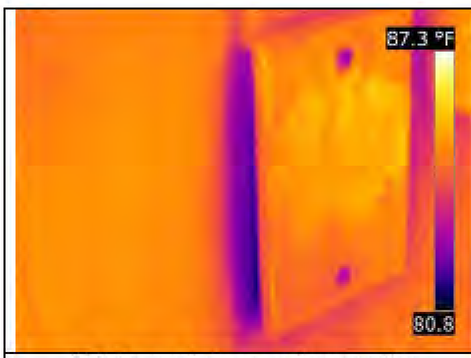
Fern Forest Nature Preserve BP8



"D3" Energy loss around door



"D3" Recommend weather strip and door sweep



"A" Energy loss around penetration

"A" Recommend sealant at penetrations

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19. *Easterlin Park BP3*

1000 NW 38 Street

Easterlin Park BP3 is a single story 36,194 sq/ft building with a concrete exterior. The largest area of infiltration/ex-filtration was at the doors on all sides of the buildings. These doors would benefit from new sweeps and weather strip. We recommend sealing penetrations and blank openings to reduce air and moisture infiltration and ex-filtration leading to energy loss. The windows are single pane, tinted with metal frames and in good condition.

Easterlin Park BP3

"A" Recommend sealant

"D1" Recommend weather strip, astragal & door sweep

"D2" Recommend weather strip & door sweep

"C" Recommend sealant

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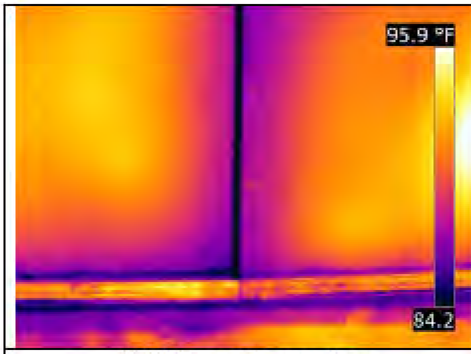
20. Secret Woods, BP10

2701 W. State Road 84

Secret Woods, BP10 is a one story 7,257 sq/ft building, with a wood exterior finish. The largest area of infiltration /ex-filtration was at the doors on all sides of the building. The doors would benefit from new sweeps, astragals and weather strip. We recommend sealing around penetrations to reduce further air and moisture infiltration and/or ex-filtration. The building appears to have single pane windows, with deteriorated sealant that is no longer effective. We recommend resealing the ineffective areas of sealant on the window box to wall.


Secret Woods, BP10



"D9" Energy loss at door


"D9" Recommend weather strip, astragal & door sweeps


"C" Recommend sealant


"W7" Recommend sealant

22. CD Regional Park BP1

3700 NW 11TH PL

CD Regional Park BP1 is a two story, 50,516 sq/ft building, with a concrete exterior finish, and a single story Tropical Splash aquatic center. The windows are single pane, tinted with aluminum frames. Several windows in the aquatic complex would benefit from sealant around the perimeter of the window box to wall. The largest area of infiltration/ex-filtration was around the doors on all sides of the building. The doors would benefit from new sweeps, astragals and weather strip to reduce energy loss. We recommend sealing around penetrations to reduce air infiltration/ex-filtration and energy loss.


CD Regional Park BP1


"D2" Recommend weather strip, astragal and door sweeps


"D1" Recommend weather strip, astragal and door sweeps


"A" Recommend sealant


"D12" Recommend weather strip and door sweeps

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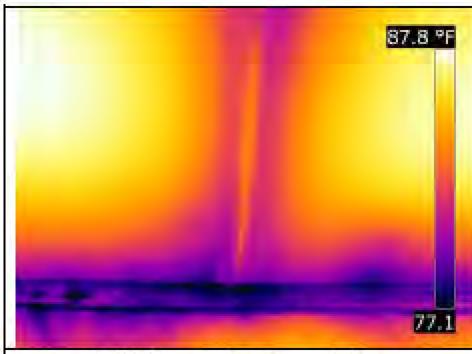
23. Plantation Heritage BP 9

1100 S. Fig Tree Lane

Plantation Heritage BP 9, is a one story 7,674 sq/ft building, with a stucco exterior finish. The largest area of infiltration/ex-filtration was at the doors on all sides of the building. These doors would benefit from new sweeps, weather strip and astragals where needed, to reduce air and moisture infiltration/ex-filtration. We recommend sealing around penetrations. The windows are single pane, tinted and in good condition; however, a few require sealant around the perimeter to reduce energy loss. Most of the windows were covered with hurricane protection shutters.

Plantation Heritage BP 9



"D1" Energy loss around doors

"D1" Recommend weather strip and door sweep

"B" Recommend sealant

"D8" Recommend weather strip and door sweep

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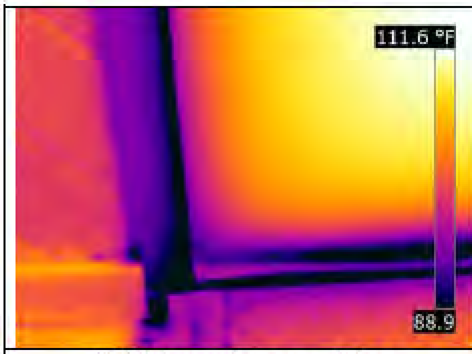
26. Hollywood North Beach BP 11

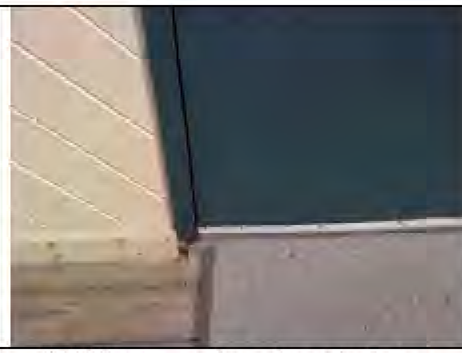
3601 N. Ocean Drive

Hollywood North Beach BP 11 is a single story 4,000 sq/ft building, with a wood exterior finish. The largest area of infiltration/ex-filtration was at the doors on all sides of the buildings. These doors would benefit from new sweeps and weather strip. We recommend sealing around penetrations and window frame to reduce air and moisture infiltration/ex-filtration and energy loss.

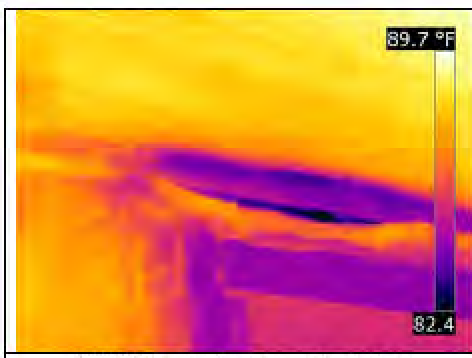
Hollywood North Beach BP 11



"D1" Energy loss around door



"D1" Recommend weather strip & door sweeps



"W1" Energy loss around window

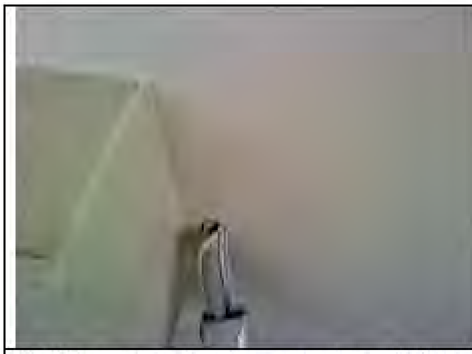
"W1" Recommend sealant around windows

27. Topeekeegee Yugnee Park BP2

3300 N. Park Road

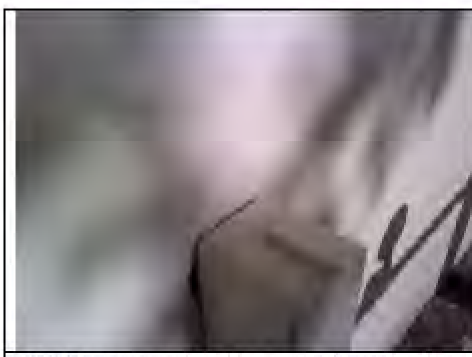
Topeekeegee Yugnee Park BP2 is a single story 44,378 sq/ft concrete and stucco building. The doors would benefit from new sweeps and weather strip. Our team also noted penetrations that we recommend sealing to reduce air and moisture infiltration/ex-filtration and energy loss. The window sealant is weathered and deteriorated and no longer effective; we recommend sealing the corner gaps and around the perimeter of the window frames to wall to reduce air and moisture infiltration/ex-filtration and energy loss

Topeekeegee Yugnee Park BP2



"A" Recommend sealing around penetrations

"D1" Recommend weather strip & door sweeps



"B" Recommend sealing around penetrations

"D9" Recommend weather strip and door sweeps

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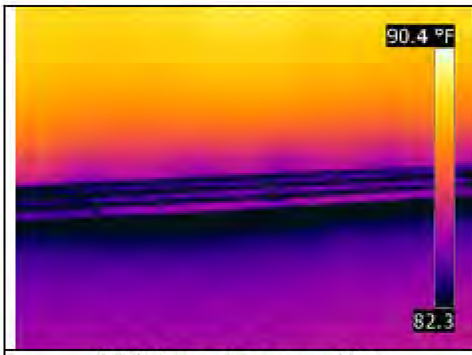
32. Integrated Waste South Landfill BO33

6541-7101 SE 205th Ave.
Fort Lauderdale, FL 33332

The INTEG Waste South Landfill is one story 17,847 square foot concrete building. The largest area of air infiltration/ex-filtration is around entrance doors on all sides of the building. Weather strip, door sweeps and astragals (where applicable) are either, worn and damaged or missing all together. These should be replaced to reduce unwanted air in-filtration/ex-filtration. In addition, weather strip and sweeps should be added to overhead doors to reduce the amount of unconditioned air entering through the garage area. Also sealant is recommended in the corner gaps of the windows.


Integrated Waste South Landfill



"D3" Energy loss around door


"D3" Recommend new door seals


"D5" Recommend weather strip and door sweep

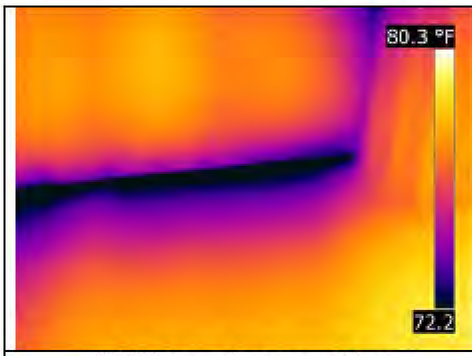

"D2" Recommend door seals

37. BSO Maintenance Facility BR42

2001 NW 31st Ave.
Lauderdale Lakes, FL 33311

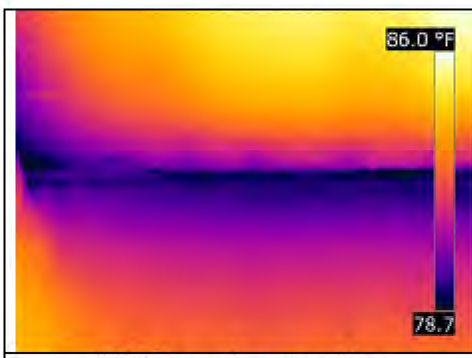
The BSO Maintenance Facility is one story 14,800 square foot concrete building. The largest area of air infiltration/ex-filtration is around entrance doors on all sides of the building. Weather strip, door sweeps are either, worn and damaged or missing all together. These should be replaced to reduce unwanted air in-filtration/ex-filtration. We recommend sealing around the perimeters of the window box.


BSO Maintenance Facility



"D8" Energy loss around door


"D8" Recommend new door seals



"D3" Energy loss around door


"D3" Recommend weather strip and door sweeps

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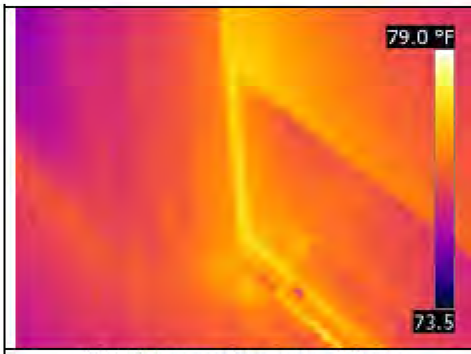
38. Government Center West BO30

1 University Drive.
Plantation, FL 33324

The Government Center West is four story 184,820 square foot concrete building. The largest area of air infiltration/ex-filtration is around entrance doors on all sides of the building. Weather strip, door sweeps and astragals (where applicable) are either, worn and damaged or missing all together. These should be replaced to reduce unwanted air in-filtration/ex-filtration.

Government Center West



"D18" Energy loss around doors

"D18" Recommend door seals

"D7" Recommend weather strip and door sweeps

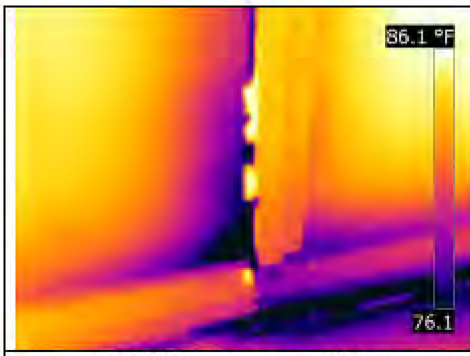
"D3" Recommend weather strip, astragal and door sweeps

40. African American Library BL13

2650 NW 6th Street
Fort Lauderdale, FL 33311

The African American Library is two story 183,712 square foot concrete building. The largest area of air infiltration/ex-filtration is around entrance doors on all sides of the building. Weather strip, door sweeps and astragals (where applicable) are either, worn and damaged or missing all together. These should be replaced to reduce unwanted air in-filtration/ex-filtration. We recommend sealing around the perimeters of the window box.

African American Library



"D6" Energy loss around door

"D6" Recommend new door seals and astragal

"W1" Recommend sealant

"D17 OH" Recommend weather strip and door sweeps

Calculation of Energy Savings

The energy savings derived from this measure are a result of the heating and cooling systems (chillers and boilers) not having to work as hard to achieve the desired environmental conditions. The amount of savings is dependent on the existing building conditions and the amount of air leakage under the current operating conditions.

Energy savings are based on the ASHRAE crack method calculations. If the process reveals any variation in the as-built conditions, then savings will be adjusted accordingly. Determination of air current air leakage rates is based on many factors, including:

- Linear feet of cracks
- Square feet of openings
- Stack coefficient
- Shield class
- Average wind speed
- Heating or cooling set point
- Average seasonal ambient temperatures

Savings due to infiltration reduction:

The following equation is based on the ASHRAE crack method:

Heat loss per hour: $\dot{q}$ = 1.08 x Q x ΔT

Where Q represents the airflow in cubic feet per minute (CFM) and is calculated in the following manner:

$$Q = A_{crack} \times \sqrt{(C_s \Delta T + C_w V^2}$$

In this equation, *A* represents the crack area in square inches to be reduced. The other values in the equation are standard for these buildings and are based upon shelter class, height, and local wind speed.

- Cw = wind coefficient = 0.0104 average
- V = wind speed = 8.8 average mph
- Cs = stack coefficient = 0,0299 (two-story typical)
- ΔT = temperature difference = $T_{out} - T_{in}$

ΔT is calculated by subtracting the average outdoor air temperature per hour from the indoor temperature, using 24 data points per month to accurately account for weather variances, and subsequently calculating airflow and heat loss for each set of data. Therefore, 288 data points are used, and Δt is the number of hours each data point represents. The total heat loss is calculated as follows:

$$q = \sum_{x=1}^{288} 1.08 \times A_{crack} \times \sqrt{C_s\left(T_{out} - T_{in}\right) + C_w V^2} \times \left(T_{out} - T_{in}\right) \times \Delta t$$

Savings due to insulation improvements:

Steady-state, one dimensional heat flow through insulation systems is governed by Fourier's law:

q = - k·A·dT/dx * Hrs / 1MMBTU

Where:

q = rate of heat flow, Btu/hr
A = cross sectional area normal to heat flow, ft2
k = thermal conductivity of the insulation material, Btu-in/h ft2°F
dT/dx = temperature gradient, °F/in

Note that changes in occupancy hours, heating and cooling set points and weather conditions will all affect the savings potential of this envelope improvement measure. An increase in operating hours or the heating set point will reduce the savings potential, but at a rate substantially less than heating costs would have been affected prior to the implementation of these strategies.

Project Name: Broward County
Date of Report: 11/21/2017
Type of Report: Building Envelope Calculation
Weather Data City/State: Ft Lauderdale AP, FL

Information provided by customer
Information provided by our company

Definitions:
ASHRAE Fundamentals 16.23-48 Applies $Q=A_L*sqrt(C_S*\Delta t+C_W*U^2)$
$Q_T = Q*I$ = Infiltrated/Exfiltrated Air Flow Rate, Cfm
Q = Air Flow Rate, Cfm
A_L = Effective air leakage area, in^2
C_S = Stack coefficient, cfm^2/(in^4*°F)
C_W = Wind Coefficient, cfm^2/(in^4*mph^2)
Δt = Indoor - Outdoor temperature differential
U = Wind speed, mph
I = Infiltration/Exfiltration Factor

Inputs and Assumptions:

African American Library BL13				Broward County
Temperature Which Heating Begins		68	°F	Used to Establish Maximum Outdoor Temperature for Heating System Operation
Temperature Which Cooling Begins		74	°F	Used to Establish Minimum Outdoor Temperature for Cooling System Operation
Day Operation Begins (Sunday is Day 1)		1	Sunday	These Values Used to Establish Occupied Hours vs Unoccupied Hours
Day Operation Ends (Sunday is Day 1)		7	Saturday	
Hour Operation Begins (Hour 1 is Midnight to 1 AM)		8	Hour	
Hour Operation Ends (Hour 1 is Midnight to 1 AM)		19	Hour	
Directional Wind Infiltration/Exfiltration		70%	percent	
Occupied Cooling Temperature Setpoint		74	°F	Used for Occupied Cooling Enthalpy Calculations
Occupied Heating Temperature Setpoint		68	°F	Used for Occupied Heating ΔT Calculations
Unoccupied Cooling Indoor Temperature Setpoint		80	°F	Used for Unoccupied Cooling Enthalpy Calculations
Unoccupied Heating Indoor Temperature Setpoint		60	°F	Used for Unoccupied Heating ΔT Calculations
Cooling Plant Efficiency		1	kW/ton	
Heating Plant Efficiency		100%	percent	
Energy Cost $/kWh	$	0.04560	per kWh	Electric
Fuel Energy Cost $/kWh	$	0.04560	per kWh	Electric
# of Floors in Building		2		
Local Shelter Class (see Table 5 below)		3	Typical shelter used by other buildings across the street from building under study	
A_L = Effective Air Leakage Area from Survey, ft^2		6.69	ft^2	
Existing Insulation Area from Survey, ft^2			ft^2	
Existing U-Value				
Proposed U-Value				

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Calculations:

African American Library BL13		Broward County
Air Leakage from Survey, in^2 = (144 * 7 ft^2):	963	in²
Selected Basic Model Stack Coefficient C_S	0.02990	cfm^2/(in^4 x °F)
Selected Basic Model Wind Coefficient C_W	0.0086	cfm^2/(in^4*mph^2)
Cooling Season Energy from Weather Table-Occupied Cooling ton-hours (84,285,674 Btu / 12,000 Btu/ton):	7,024	ton-hours
Cooling Season Energy from Weather Table-Unoccupied Cooling ton-hours (18,569,838 Btu / 12,000 Btu/ton):	1,547	ton-hours
Heating Season Energy from Weather Table-Occupied (4,072,967 Btu / 3,412 Btu):	1,194	kWh
Heating Season Energy from Weather Table-Unoccupied (2,616,417 Btu / 3,412 Btu):	767	kWh
ECM Energy and Cost Savings:		
Cooling Season kWh Energy Savings-Occupied (7,024 ton-hours * 1.00 kW/ton):	7,024	kWh/yr
Cooling Seasons kWh Energy Savings-Unoccupied (1,547 ton-hours * 1.00 kW/ton):	1,547	kWh/yr
Controls Occupied Hours Per Year	4,380	Hrs/year
Controls Unoccupied Hours Per Year	4,380	Hrs/year
Fuel Energy Savings-Heating Season-Occupied (1,194 kWh / 100 %):	1,194	kWh/yr
Fuel Energy Savings-Heating Season-Unoccupied (767 kWh / 100 %):	767	kWh/yr
Cooling Season kWh Energy Cost Savings-Occupied (7,024 kWh/Yr x $0.04560 per kWh):	$ 320	per year
Cooling Season kWh Energy Cost Savings-Unoccupied (1,547 kWh/Yr x $0.04560 per kWh):	$ 71	per year
Fuel Energy Cost Savings-Heating Season-Occupied (1,194 kWh x $0.05 per kWh):	$ 54	per year
Fuel Energy Cost Savings-Heating Season-Unoccupied (767 kWh x $0.05 per kWh):	$ 35	per year
Total Savings Cost ($320 kWh/yr + $71 kWh/yr + $54 kWh/yr + $35 kWh/yr):	$ 480	per year
Building Insulation		
Cooling Season kWh Energy Savings-Occupied (ft^2 x (. U-Value - . U-Value) * 24 * 2571 CDD / 12,000 Btu/ton) * (1.00 kW/ton):	0	kWh/yr
Cooling Season kWh Energy Savings-Unoccupied (ft^2 x (. U-Value - . U-Value) * 24 * 1602 CDD / 12,000 Btu/ton) * (1.00 kW/ton):	0	kWh/yr
Fuel Energy Savings-Heating Season-Occupied (ft^2 x (. U-Value - . U-Value) * 24 * 138 HDD / 3,412 Btu) / (100 %):	0	kWh
Fuel Energy Savings-Heating Season-Unoccupied (ft^2 x (. U-Value - . U-Value) * 24 * 265 HDD / 3,412 Btu) / (100 %):	0	kWh
Cooling Season kWh Energy Cost Savings-Occupied (kWh/Yr x $0.04560 per kWh):	$ -	per year
Cooling Season kWh Energy Cost Savings-Unoccupied (kWh/Yr x $0.04560 per kWh):	$ -	per year
Fuel Energy Cost Savings-Heating Season-Occupied (kWh x $0.05 per kWh):	$ -	per year
Fuel Energy Cost Savings-Heating Season-Occupied (kWh x $0.05 per kWh):	$ -	per year
Total Savings Cost ($0 kWh/yr + $0 KWh/yr + $0 KWh/yr + $0 KWh/yr):	$ -	per year

Crack area Calculation		
Width	LF	ft²
1/16	322	1.677
1/8	295	3.073
1/4	93	1.938
1/2		0.000
3/4		0.000
1		0.000
1 1/2		0.000
2		0.000
		6.688
Penetrations		
		6.688

Constants and calculated values used in calculations:

Occupied Indoor Enthalpy at 74° F and 60% RH	29.566	Btu/lb (air)
Unoccupied Indoor Enthalpy at 80° F and 60% RH	33.692	Btu/lb (air)
ASHRAE Sensible Heat Coefficient	1.08	
ASHRAE Enthalpy Coefficient	4.5	
Btu/ton	12,000	Btu/ton
Btu	3412	Btu

These calculations are based on ASHRAE Fundamentals 2009, chapter 16, page 16.23, formula number 48 as shown below.

Basic Model. The following calculations are based on the Sherman and Grimsrud (1980) model, which uses the effective air leakage area at 0.016 in. of water. This leakage area can be obtained from a whole-building pressurization test. Using effective air leakage area, the airflow rate from infiltration is calculated according to

$$Q = A_L \sqrt{C_s \Delta t + C_w U^2} \qquad (48)$$

where

Q = airflow rate, cfm
A_L = effective air leakage area, in²
C_s = stack coefficient, cfm²/(in⁴·°F)
Δt = average indoor-outdoor temperature difference for time interval of calculation, °F
C_w = wind coefficient, cfm²/(in⁴·mph²)
U = average wind speed measured at local weather station for time interval of calculation, mph

Table 4 presents values of C_s for one-, two-, and three-story houses. The value of wind coefficient C_w depends on the local shelter class of the building (described in Table 5) and the building height. Table 6 presents values of C_w for one-, two-, and three-story houses in shelter classes 1 through 5. In calculating values in Tables 4 and 6, the following assumptions were made regarding input to the basic model:

ASHRAE TABLE 16.23, Table 4 Basic Model Stack Coefficient C_S:

Story	Stack Coefficient C_S
1	0.01500
2	0.02990
3	0.04490
4	0.06283
5	0.07858
6	0.09433
7	0.11008
8	0.12583
9	0.14158
10	0.15733

ASHRAE TABLE 16.23, Table 5 Local Shelter Class:

1 No Obstructions or local shielding
2 Typical shelter for an isolated rural house
3 Typical shelter used by other buildings across the street from building under study
4 Typical shelter for urban buildings on larger lots where sheltering obstacles are more than one building height away
5 Typical shelter produced by building or other structures immediately adjacent

ASHRAE TABLE 16.23, Table 6 Basic Model Wind Coefficient C_W:

# of Stories	Shelter Class 1	Shelter Class 2	Shelter Class 3	Shelter Class 4	Shelter Class 5	Values Used
1	0.0119	0.0092	0.0065	0.0039	0.0012	0.0065
2	0.0157	0.0121	0.0086	0.0051	0.0016	0.0086
3	0.0184	0.0143	0.0101	0.0060	0.0018	0.0101
4	0.0218	0.0170	0.0120	0.0071	0.0021	0.0120
5	0.0251	0.0195	0.0138	0.0082	0.0024	0.0138
6	0.0283	0.0221	0.0156	0.0092	0.0027	0.0156
7	0.0316	0.0246	0.0174	0.0103	0.0030	0.0174
8	0.0348	0.0272	0.0192	0.0113	0.0033	0.0192
9	0.0381	0.0297	0.0210	0.0124	0.0036	0.0210
10	0.0413	0.0323	0.0228	0.0134	0.0039	0.0228

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Indoor Cooling Occupied Setpoint Calculations			
Dry Bulb Temp	DB	74	Deg F
Relative Humidity	RH	60	%
Humidity Ratio	W	0.0108	lb v/lb dry air
		75.55	grains/lb dry air
Enthalpy	h	29.566	BTH/lb dry air
Dew Point Temp	DP	59.30	Deg F
Saturation Pressure	PW	0.2496	
Saturation Pressure	PWS	0.4159	
	TDBR	533.67	Rankin
* All calculations assume TDB and TWB above 32 Deg F			

Indoor Cooling Unoccupied Setpoint Calculations			
Dry Bulb Temp	DB	80	Deg F
Relative Humidity	RH	60	%
Humidity Ratio	W	0.0132	lb v/lb dry air
		92.51	grains/lb dry air
Enthalpy	h	33.692	BTH/lb dry air
Dew Point Temp	DP	64.92	Deg F
Saturation Pressure	PW	0.3044	
Saturation Pressure	PWS	0.5074	
	TDBR	539.67	Rankin
* All calculations assume TDB and TWB above 32 Deg F			

SOLAR ECM Calculations

- S1 Install Solar PV System

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Solar Savings Calculations

The solar savings calculations were performed with ENEGRY TOOLBASE program. Energy Toolbase is an industry leading software platform for analyzing and proposing the economics of solar PV and energy storage projects. Hundreds of the leading renewable energy developers nationwide use our software-as-a-service product to accurately, objectively and transparently analyze their projects and create customer proposals.

ENERGY TOOLBASE™

Savings check-up

Prepared For
Broward County

Prepared By
Carl Klinck
(626) 658-6057
cklinck@opterraenergy.com

1/12/2018

The Energy Toolbase provides comprehensive cost analysis for commercial, municipal, and residential renewable energy projects. We provide the tools that professionals need to compete in the fast paced renewable energy market by leveraging our first hand experience developing energy projects. Our software developers are NABCEP certified energy professionals and have completed energy analysis for companies including the Mirage Casino Resorts, Boston Scientific, Leviton, Balfour Beatty Construction, and many others.

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2.1.1 PV System Details

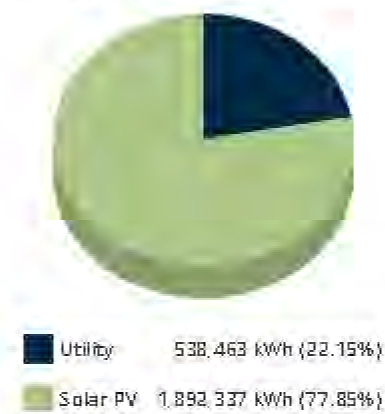
General Information
Facility: North Regional Courthouse
Address: Broward County FL

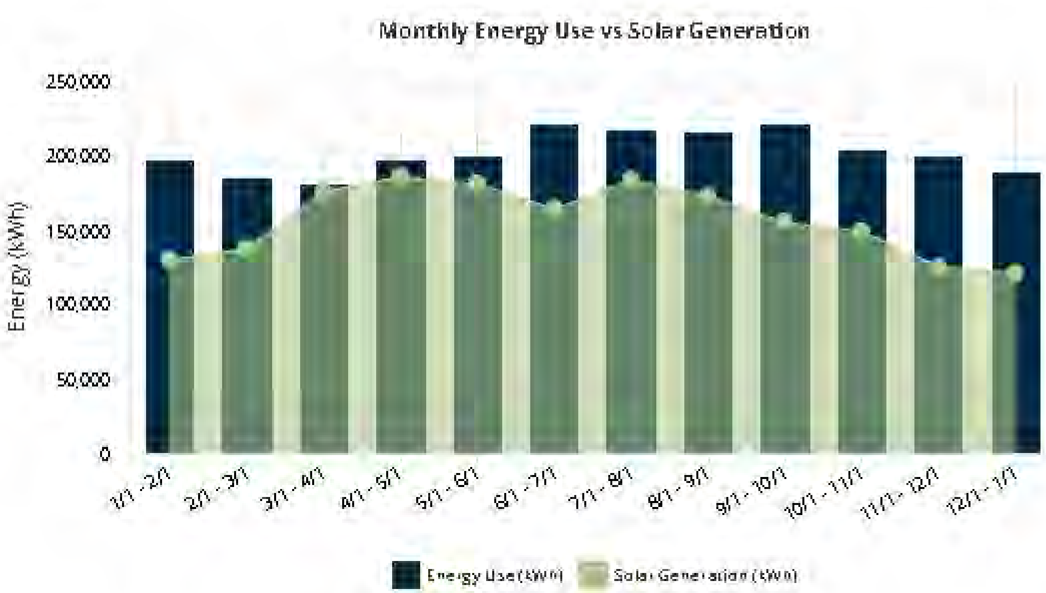
Solar PV Equipment Description
Solar Panels: 1,239.0 kW-DC Standard Modules
Inverters: Standard Inverter

Solar PV Equipment Typical Lifespan
Solar Panels: Greater than 30 Years
Inverters: 15 Years

Solar PV System Rating
Power Rating: 1,239,000 W-DC
Power Rating: 1,079,243 W-AC-CEC

Energy Consumption Mix
Annual Energy Use: 2,430,800 kWh





ENERGY TOOLBASE™
Prepared By: Carl Klinck
P: (626) 658-6057, E: cklinck@opterraenergy.com

2.1.3 Utility Rates

The table below shows the rates associate with your current utility rate schedule (GSLD-1). Your estimated electric bills after solar are shown on the following page.

Fixed Charges		Energy Charges		Demand Charges	
Type	GSLD-1	Type	GSLD-1	Type	GSLD-1
S Monthly	$75.00	S Flat Rate	$0.04937	S NC	$12.56
W Monthly	$75.00	W Flat Rate	$0.04937	W NC	$12.56

2.1.4 Current Electric Bill

The table below shows your annual electricity costs based on the most current utility rates and your previous 12 months of electrical usage.

Rate Schedule: FPL - GSLD-1

Time Periods	Energy Use (kWh)	Max Demand (kW)	Charges			
Bill Ranges & Seasons	Total	NC / Max	Other	Energy	Demand	Total
1/1/2017 - 2/1/2017 W	196,800	386	$75	$9,716	$4,848	$14,639
2/1/2017 - 3/1/2017 W	184,400	401	$75	$9,104	$5,037	$14,215
3/1/2017 - 4/1/2017 W	181,600	400	$75	$8,966	$5,024	$14,065
4/1/2017 - 5/1/2017 S	197,200	399	$75	$9,736	$5,011	$14,822
5/1/2017 - 6/1/2017 S	200,400	402	$75	$9,894	$5,049	$15,018
6/1/2017 - 7/1/2017 S	222,000	407	$75	$10,960	$5,112	$16,147
7/1/2017 - 8/1/2017 S	217,600	518	$75	$10,743	$6,506	$17,324
8/1/2017 - 9/1/2017 S	216,000	437	$75	$10,664	$5,489	$16,228
9/1/2017 - 10/1/2017 S	222,400	426	$75	$10,980	$5,351	$16,405
10/1/2017 - 11/1/2017 S	203,600	420	$75	$10,052	$5,275	$15,402
11/1/2017 - 12/1/2017 W	200,000	404	$75	$9,874	$5,074	$15,023
12/1/2016 - 1/1/2017 W	188,800	392	$75	$9,321	$4,924	$14,320
Totals:	2,430,800	-	$900	$120,009	$62,700	$183,608

2.1.5 New Electric Bill

Rate Schedule: FPL - GSLD-1

Time Periods	Energy Use (kWh)	Max Demand (kW)	Charges			
Bill Ranges & Seasons	Total	NC / Max	Other	Energy	Demand	Total
1/1/2017 - 2/1/2017 W	65,776	382	$75	$3,247	$4,792	$8,114
2/1/2017 - 3/1/2017 W	45,963	390	$75	$2,269	$4,892	$7,236
3/1/2017 - 4/1/2017 W	4,841	387	$75	$239	$4,861	$5,175
4/1/2017 - 5/1/2017 S	10,402	372	$75	$514	$4,672	$5,261
5/1/2017 - 6/1/2017 S	18,525	370	$75	$915	$4,647	$5,637
6/1/2017 - 7/1/2017 S	56,714	387	$75	$2,800	$4,861	$7,736
7/1/2017 - 8/1/2017 S	33,080	487	$75	$1,633	$6,117	$7,825
8/1/2017 - 9/1/2017 S	42,055	421	$75	$2,076	$5,288	$7,439
9/1/2017 - 10/1/2017 S	66,376	408	$75	$3,277	$5,124	$8,476
10/1/2017 - 11/1/2017 S	53,560	402	$75	$2,644	$5,043	$7,762
11/1/2017 - 12/1/2017 W	73,898	398	$75	$3,648	$4,999	$8,722
12/1/2016 - 1/1/2017 W	67,273	383	$75	$3,321	$4,804	$8,200
Totals:	538,463	-	$900	$26,584	$60,100	$87,584

Annual Electricity Savings: $96,025

Site Name: Traffic Engineering Admin North
Service Address: 4900 W PROSPECT RD, FORT LAUDERDALE FL, 33309
Square Feet: 71,346

Electric History

Account: 5910870038
Meter: MV3703A
Rate: SDTR-1
Baseline: Average of Last Two Years

	High Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		73	82	82	78	**78**
February		86	89	89	88	**88**
March		91	71	71	81	**81**
April		92	113	113	103	**103**
May		94	107	107	101	**101**
June		113	106	106	110	**110**
July		114	110	110	112	**112**
August		109	91	91	100	**100**
September		101	83	83	92	**92**
October		109	73	73	91	**91**
November		88	77	77	77	**77**
December	91	91		91	91	**91**
Annual				**1,093**	**1,122**	**1,122**

	On-Peak Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		113	106	106	110	**110**
July		114	110	110	112	**112**
August		109	91	91	100	**100**
September		101	83	83	92	**92**
October		81	52	52	67	**67**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**442**	**480**	**480**

	On-Peak Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		5,520	5,280	5,280	5,400	**5,400**
July		6,120	5,100	5,100	5,610	**5,610**
August		6,360	4,440	4,440	5,400	**5,400**
September		5,460	3,540	3,540	4,500	**4,500**
October		240	180	180	210	**210**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**18,540**	**21,120**	**21,120**

	Off-Peak Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		35,220	40,500	40,500	37,860	**37,860**
February		37,500	37,560	37,560	37,530	**37,530**
March		45,660	26,940	26,940	36,300	**36,300**
April		44,700	29,700	29,700	37,200	**37,200**
May		53,820	60,000	60,000	56,910	**56,910**
June		53,280	49,200	49,200	51,240	**51,240**
July		58,380	49,620	49,620	54,000	**54,000**
August		61,080	38,280	38,280	49,680	**49,680**
September		51,420	29,700	29,700	40,560	**40,560**
October		53,040	31,680	31,680	42,360	**42,360**
November		43,140	31,080	31,080	37,110	**37,110**
December	48,180	44,280		44,280	46,230	**46,230**
Annual				**468,540**	**526,980**	**526,980**

	Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$2,745	$3,214	$3,214	$2,980	**$ 2,980**
February		$3,009	$3,128	$3,128	$3,069	**$ 3,069**
March		$3,522	$2,399	$2,399	$2,961	**$ 2,961**
April		$3,349	$3,032	$3,032	$3,190	**$ 3,190**
May		$3,842	$4,737	$4,737	$4,290	**$ 4,290**
June		$4,480	$4,568	$4,568	$4,524	**$ 4,524**
July		$4,790	$4,615	$4,615	$4,703	**$ 4,703**
August		$4,873	$3,713	$3,713	$4,293	**$ 4,293**
September		$4,229	$3,054	$3,054	$3,642	**$ 3,642**
October		$3,973	$2,710	$2,710	$3,342	**$ 3,342**
November		$3,221	$2,709	$2,709	$2,965	**$ 2,965**
December	$3,787	$3,313		$3,313	$3,550	**$ 3,550**
Annual				**$41,192**	**$43,508**	**$ 43,508**

Table 3-3
Broward County - Group B Properties
Annual Utility Summary

Site	Area (sf)	Avg. Electric Monthly Demand (kW)	Electric Use (kWh)	kWh/ sf	Electric Btu/sf	Electric $	El. $/KWH	Total $	$/sf
PARKS									
CD Regional	50,516	670	1,577,766	31.23	106,598	$169,268	$0.1073	$169,268	$3.35
Topokeegee Yungee	44,378	361	1,580,703	35.62	121,568	$147,077	$0.0930	$147,077	$3.31
Easterlin	36,194	50	284,961	7.87	26,871	$27,006	$0.0948	$27,006	$0.75
Tree Tops	26,103	72	307,209	11.77	40,168	$29,343	$0.0955	$29,343	$1.12
Long Key[4]	23,591	88	290,538	12.32	42,033	$30,170	$0.1038	$30,170	$1.28
West Lake / Anne Kolb NC	20,776	131	580,983	27.96	95,442	$50,787	$0.0874	$50,787	$2.44
Brian Piccolo	11,706	533	453,964	38.78	132,358	$80,761	$0.1779	$80,761	$6.90
Fern Forest	9,893	34	99,551	10.06	34,344	$11,124	$0.1117	$11,124	$1.12
Plantation Heritage	7,674	58	189,933	24.75	84,472	$20,421	$0.1075	$20,421	$2.66
Secret Woods	7,257	35	105,832	14.58	49,773	$11,412	$0.1078	$11,412	$1.57
Hollywood North Beach	4,000	-	69,108	17.28	58,966	$8,363	$0.1210	$8,363	$2.09
Saw Palmetto	160	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
PARK TOTALS	242,248	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
LIBRARIES									
African American	61,150	321	1,671,600	27.34	93,298	$132,002	$0.0790	$132,002	$2.16
SW Regional[1]	79,747			-	-		#DIV/0!	$0	$0.00
West Regional	72,000	275	1,395,480	19.38	66,150	$114,809	$0.0823	$114,809	$1.59
North West Regional	72,000	337	1,396,080	19.39	66,178	$123,220	$0.0883	$123,220	$1.71
Weston	51,000	288	1,102,020	21.61	73,749	$100,460	$0.0912	$100,460	$1.97
Lauderdale Lakes	20,237	88	313,410	15.49	52,857	$29,505	$0.0941	$29,505	$1.46
Stirling Road	20,000	82	405,342	20.27	69,172	$34,121	$0.0842	$34,121	$1.71
North Lauderdale	20,000	118	490,980	24.55	83,786	$43,395	$0.0884	$43,395	$2.17
Dan Pearl	19,500	107	404,700	20.75	70,833	$37,605	$0.0929	$37,605	$1.93
Margate	15,800	82	447,960	28.35	96,765	$36,293	$0.0810	$36,293	$2.30
Hallandale	14,700	62	305,400	20.78	70,907	$26,402	$0.0864	$26,402	$1.80
Century Plaza	11,682	43	190,189	16.28	55,565	$17,485	$0.0919	$17,485	$1.50
Dania Beach	9,970	42	233,832	23.45	80,047	$19,365	$0.0828	$19,365	$1.94
Carver Ranches	16,700	92	298,440	17.87	60,993	$29,268	$0.0981	$29,268	$1.75
Pompano Branch	10,000	57	216,270	21.63	73,813	$19,971	$0.0923	$19,971	$2.00
LIBRARY TOTALS	494,486	1,993	8,871,702	17.94	61,234	$763,902	$0.0861	$763,902	$1.54
OFFICE AND COURTHOUSE									
Public Safety Complex - Public Safety Building	253,076	954	6,328,860	25.01	85,351	$367,264	$0.0580	$367,264	$1.45
Public Safety Complex - BSO D5 Office	20,250	102	658,260	32.51	110,945	$48,401	$0.0735	$48,401	$2.39
Public Safety Complex - Inventory & Evidence Bldgs	20,704	63	285,120	13.77	47,001	$24,139	$0.0847	$24,139	$1.17
Public Safety Complex - Logistics Warehouse	6,690	18	114,840	17.17	58,587	$8,950	$0.0779	$8,950	$1.34
North Regional Courthouse	200,000	417	2,448,200	12.24	41,779	$192,152	$0.0785	$192,152	$0.96
Government Center West	184,820	587	3,389,640	18.34	62,595	$215,041	$0.0634	$215,041	$1.16
Traffic Engn Administration North	71,346	342	2,364,660	33.14	113,119	$172,549	$0.0730	$172,549	$2.42
Park Administration Complex	35,296	76	325,530	9.22	31,478	$29,317	$0.0901	$29,317	$0.83
Integ Waste South Landfill	17,847	166	998,826	55.97	191,012	$78,571	$0.0787	$78,571	$4.40
OFFICE & COURTHOUSE TOTALS	810,029	2,725	16,913,936	20.88	71,266	$1,136,383	$0.0672	$1,136,383	$1.40
HEALTH AND LAB									
Central Homeless Assistance Center[3]	63,244			-	-		#DIV/0!	$0	$0.00
Booher Building	53,060	259	1,680,570	31.67	108,100	$126,221	$0.0751	$126,221	$2.38
North Homeless Assistance Center[2]	44,254			-	-		#DIV/0!	$0	$0.00
Family Success Center, N, Pompano	11,929	33	244,320	20.48	69,902	$23,660	$0.0968	$23,660	$1.98
Sexual Assault Treatment Center	10,643	44	182,730	17.17	58,598	$16,442	$0.0900	$16,442	$1.54
EPD Environmental Monitoring Facility & Laboratory	9,694	151	986,940	101.81	347,475	$75,219	$0.0762	$75,219	$7.76
EAP Our House	1,127	-	15,676	13.91	47,473	$1,665	$0.1062	$1,665	$1.48
HEALTH AND LAB TOTALS	193,951	488	3,110,236	16.04	54,732	$243,207	0.0781958	$243,207	$1.25
PARKING, WAREHOUSE AND REPAIR									
MASS TRAN, North Maintenance	195,189	481	3,424,613	17.55	59,881	$249,319	$0.0728	$249,319	$1.28
BSO Maintenance Facility	14,800	40	233,160	15.75	53,769	$18,646	$0.0800	$18,646	$1.26
BCJC South Parking Garage	14,397	110	921,717	64.02	218,505	$73,602	$0.0799	$73,602	$5.11
HIGH & BRDG Mosquito Control, Pembroke	9,865	24	109,047	11.05	37,727	$9,552	$0.0876	$9,552	$0.97
South Maintenance Shop	6,024	-	75,671	12.56	42,873	$7,828	$0.1034	$7,828	$1.30
MASS TRAN Northeast Terminal	2,000	22	111,300	55.65	189,933	$9,455	$0.0850	$9,455	$4.73
PARKING, WAREHOUSE & REPAIR TOTALS	242,275	678	4,875,507	20.12	68,683	$368,402	$0.0756	$368,402	$1.52
GROUP B TOTALS	**1,982,989**	**#REF!**	**#REF!**	**#REF!**	**#REF!**	**#REF!**	**#REF!**	**#REF!**	**#REF!**

1 - Electricity and chilled water provided by Charter School attached to building. County is billed by the City of Pembroke Pines; however, this data was not made available to OpTerra.
2 - Annual cost for utility was obtained from the site. Utility usage estimated based upon using average cost for utilities.
3 - No utility data was available. Utility usage estimated based upon the energy indice of the North Homeless Assistance Center.
4 - An electric meter inaccuracy was found at this site. As a result, baseline data was established using the period of Jan-2013 thru July-2015.

Site Name: CD Regional Park
Service Address: 3700 NW 11TH PL LAUDERHILL FL 33311
Square Feet: 50,516

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	730	649	643	643	646	**646**
February	702	659	652	652	656	**656**
March	762	716	719	719	718	**718**
April	768	668	721	721	695	**695**
May	724	583	716	716	650	**650**
June	734	670	247	247	459	**459**
July	747	755	256	256	506	**506**
August	749	790		790	770	**770**
September	738	829		829	784	**784**
October	731	759		759	745	**745**
November	737	677		677	707	**707**
December	715	711		711	713	**713**
Annual				**7,720**	**8,045**	**8,045**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	139,302	119,036	114,514	114,514	116,775	**116,775**
February	114,638	105,670	99,488	99,488	102,579	**102,579**
March	136,474	120,947	111,734	111,734	116,341	**116,341**
April	138,053	137,772	136,075	136,075	136,924	**136,924**
May	154,245	120,024	133,111	133,111	126,568	**126,568**
June	136,839	122,078	139,244	139,244	130,661	**130,661**
July	139,870	157,942	128,355	128,355	143,149	**143,149**
August	162,326	162,794		162,794	162,560	**162,560**
September	138,454	161,942		161,942	150,198	**150,198**
October	141,549	121,854		121,854	131,702	**131,702**
November	138,760	120,126		120,126	129,443	**129,443**
December	134,469	127,268		127,268	130,869	**130,869**
Annual				**1,556,505**	**1,577,766**	**1,577,766**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$17,143	$14,091	$14,224	$14,224	$14,157	**$ 14,157**
February	$15,232	$13,394	$13,440	$13,440	$13,417	**$ 13,417**
March	$17,387	$14,908	$15,173	$15,173	$15,040	**$ 15,040**
April	$17,575	$15,138	$16,732	$16,732	$15,935	**$ 15,935**
May	$17,642	$13,283	$16,554	$16,554	$14,919	**$ 14,919**
June	$11,072	$10,736	$11,631	$11,631	$11,184	**$ 11,184**
July	$11,740	$13,910	$11,310	$11,310	$12,610	**$ 12,610**
August	$12,756	$12,712		$12,712	$12,734	**$ 12,734**
September	$10,850	$13,186		$13,186	$12,018	**$ 12,018**
October	$16,900	$15,281		$15,281	$16,091	**$ 16,091**
November	$16,808	$14,239		$14,239	$15,523	**$ 15,523**
December	$16,310	$14,968		$14,968	$15,639	**$ 15,639**
Annual				**$169,451**	**$169,268**	**$ 169,268**

Site Name: Topokeegee Yungee
Service Address:
Square Feet: 44,378

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	342	365	354	354	360	**360**
February	321	279	367	367	323	**323**
March	373	331	376	376	354	**354**
April	423	418	403	403	411	**411**
May	380	371	392	392	382	**382**
June	337	388	324	324	356	**356**
July	314	375	385	385	380	**380**
August	351	425		425	388	**388**
September	347	389		389	368	**368**
October	328	356		356	342	**342**
November	339	343		343	341	**341**
December	363	295		295	329	**329**
Annual				**4,409**	**4,332**	**4,332**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	114,807	144,201	122,274	122,274	133,238	**133,238**
February	116,322	70,890	121,237	121,237	96,064	**96,064**
March	99,413	98,321	114,378	114,378	106,350	**106,350**
April	139,725	154,520	122,113	122,113	138,317	**138,317**
May	150,835	127,046	133,922	133,922	130,484	**130,484**
June	135,236	135,738	142,805	142,805	139,272	**139,272**
July	143,585	161,343	165,591	165,591	163,467	**163,467**
August	165,088	158,230		158,230	161,659	**161,659**
September	138,024	147,231		147,231	142,628	**142,628**
October	131,169	143,686		143,686	137,428	**137,428**
November	138,396	95,981		95,981	117,189	**117,189**
December	125,500	103,721		103,721	114,611	**114,611**
Annual				**1,571,169**	**1,580,703**	**1,580,703**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$11,673	$12,914	$11,708	$11,708	$12,311	**$ 12,311**
February	$11,496	$7,777	$11,713	$11,713	$9,745	**$ 9,745**
March	$11,042	$9,840	$11,740	$11,740	$10,790	**$ 10,790**
April	$14,193	$13,654	$12,595	$12,595	$13,125	**$ 13,125**
May	$14,064	$11,632	$13,193	$13,193	$12,413	**$ 12,413**
June	$10,625	$10,756	$12,497	$12,497	$11,626	**$ 11,626**
July	$13,313	$14,028	$15,502	$15,502	$14,765	**$ 14,765**
August	$14,797	$14,478		$14,478	$14,638	**$ 14,638**
September	$13,162	$13,274		$13,274	$13,218	**$ 13,218**
October	$12,286	$12,382		$12,382	$12,334	**$ 12,334**
November	$12,839	$9,621		$9,621	$11,230	**$ 11,230**
December	$12,274	$9,491		$9,491	$10,882	**$ 10,882**
Annual				**$148,193**	**$147,077**	**$ 147,077**

Site Name: Easterlin
Service Address:
Square Feet: 36,194

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	55	59	51	51	55	**55**
February	55	56	60	60	58	**58**
March	62	59	55	55	57	**57**
April	52	47	59	59	53	**53**
May	42	38	63	63	51	**51**
June	39	42	71	71	57	**57**
July	33	46	75	75	61	**61**
August	29	38		38	34	**34**
September	27	47		47	37	**37**
October	35	47		47	41	**41**
November	48	50		50	49	**49**
December	52	47		47	50	**50**
Annual				**663**	**601**	**601**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	24,100	22,345	23,795	23,795	23,070	**23,070**
February	21,337	24,170	22,856	22,856	23,513	**23,513**
March	29,741	25,387	22,929	22,929	24,158	**24,158**
April	23,486	18,779	25,710	25,710	22,245	**22,245**
May	21,357	20,521	31,228	31,228	25,875	**25,875**
June	22,718	21,833	31,295	31,295	26,564	**26,564**
July	20,267	23,934	39,657	39,657	31,796	**31,796**
August	16,492	24,500		24,500	20,496	**20,496**
September	16,964	25,644		25,644	21,304	**21,304**
October	18,898	19,751		19,751	19,325	**19,325**
November	25,517	20,919		20,919	23,218	**23,218**
December	25,812	20,985		20,985	23,399	**23,399**
Annual				**309,269**	**284,961**	**284,961**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$2,441	$2,192	$2,210	$2,210	$2,201	**$ 2,201**
February	$2,218	$2,267	$2,233	$2,233	$2,250	**$ 2,250**
March	$2,911	$2,405	$2,263	$2,263	$2,334	**$ 2,334**
April	$2,521	$1,878	$2,474	$2,474	$2,176	**$ 2,176**
May	$2,232	$1,919	$2,906	$2,906	$2,412	**$ 2,412**
June	$2,257	$2,054	$2,985	$2,985	$2,520	**$ 2,520**
July	$1,988	$2,238	$3,545	$3,545	$2,892	**$ 2,892**
August	$1,763	$2,216		$2,216	$1,990	**$ 1,990**
September	$1,697	$2,329		$2,329	$2,013	**$ 2,013**
October	$1,864	$1,874		$1,874	$1,869	**$ 1,869**
November	$2,414	$1,929		$1,929	$2,172	**$ 2,172**
December	$2,452	$1,905		$1,905	$2,178	**$ 2,178**
Annual				**$28,869**	**$27,006**	**$ 27,006**

Site Name: Tree Top Parks
Service Address:
Square Feet: 26,103

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

	Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	74	72	63	63	68	**68**
February	52	67	63	63	65	**65**
March	75	68	63	63	66	**66**
April	73	69	65	65	67	**67**
May	74	75	74	74	75	**75**
June	77	79	73	73	76	**76**
July	82	73	68	68	71	**71**
August	80	80		80	80	**80**
September	78	79		79	79	**79**
October	76	71		71	74	**74**
November	83	69		69	76	**76**
December	77	67		67	72	**72**
Annual				**835**	**866**	**866**

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	23,702	22,442	20,808	20,808	21,625	**21,625**
February	17,239	16,375	17,926	17,926	17,151	**17,151**
March	24,213	23,128	18,107	18,107	20,618	**20,618**
April	23,998	23,440	20,686	20,686	22,063	**22,063**
May	28,308	25,493	26,651	26,651	26,072	**26,072**
June	31,980	31,608	27,996	27,996	29,802	**29,802**
July	34,461	32,791	29,100	29,100	30,946	**30,946**
August	32,630	32,383		32,383	32,507	**32,507**
September	34,245	29,357		29,357	31,801	**31,801**
October	28,864	23,929		23,929	26,397	**26,397**
November	27,609	20,258		20,258	23,934	**23,934**
December	26,493	22,099		22,099	24,296	**24,296**
Annual				**289,300**	**307,209**	**307,209**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	$2,521	$2,229	$2,103	$2,103	$2,166	**$ 2,166**
February	$1,836	$1,797	$1,949	$1,949	$1,873	**$ 1,873**
March	$2,530	$2,232	$2,013	$2,013	$2,123	**$ 2,123**
April	$2,475	$2,204	$2,165	$2,165	$2,185	**$ 2,185**
May	$2,677	$2,370	$2,639	$2,639	$2,505	**$ 2,505**
June	$2,932	$2,760	$2,713	$2,713	$2,736	**$ 2,736**
July	$3,159	$2,756	$2,725	$2,725	$2,740	**$ 2,740**
August	$3,034	$2,815		$2,815	$2,924	**$ 2,924**
September	$3,093	$2,635		$2,635	$2,864	**$ 2,864**
October	$2,744	$2,240		$2,240	$2,492	**$ 2,492**
November	$2,749	$2,026		$2,026	$2,387	**$ 2,387**
December	$2,600	$2,095		$2,095	$2,348	**$ 2,348**
Annual				**$28,118**	**$29,343**	**$ 29,343**

Site Name: Long Key Park
Service Address:
Square Feet: 23,591

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	67	65	94	94	80	**80**
February	70	70	85	85	78	**78**
March	74	75	91	91	83	**83**
April	77	84	100	100	92	**92**
May	80	83	100	100	92	**92**
June	79	83	103	103	93	**93**
July	78	78	98	98	88	**88**
August	86	106		106	96	**96**
September	83	105		105	94	**94**
October	79	101		101	90	**90**
November	78	96		96	87	**87**
December	72	94		94	83	**83**
Annual				**1,173**	**1,055**	**1,055**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	15,488	19,862	22,696	22,696	21,279	**21,279**
February	13,650	18,233	17,295	17,295	17,764	**17,764**
March	16,410	20,418	22,121	22,121	21,270	**21,270**
April	16,273	19,677	22,780	22,780	21,229	**21,229**
May	21,097	24,672	26,571	26,571	25,622	**25,622**
June	25,712	26,109	32,054	32,054	29,082	**29,082**
July	27,252	28,097	30,572	30,572	29,335	**29,335**
August	27,800	30,354		30,354	29,077	**29,077**
September	26,949	30,215		30,215	28,582	**28,582**
October	23,948	26,321		26,321	25,135	**25,135**
November	21,667	21,409		21,409	21,538	**21,538**
December	19,786	21,470		21,470	20,628	**20,628**
Annual				**303,858**	**290,538**	**290,538**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$1,692	$2,018	$2,489	$2,489	$2,254	**$ 2,254**
February	$1,623	$1,975	$2,065	$2,065	$2,020	**$ 2,020**
March	$1,825	$2,162	$2,440	$2,440	$2,301	**$ 2,301**
April	$1,859	$2,246	$2,584	$2,584	$2,415	**$ 2,415**
May	$2,174	$2,546	$2,734	$2,734	$2,640	**$ 2,640**
June	$2,392	$2,658	$3,090	$3,090	$2,874	**$ 2,874**
July	$2,499	$2,783	$2,960	$2,960	$2,872	**$ 2,872**
August	$2,638	$3,113		$3,113	$2,875	**$ 2,875**
September	$2,534	$3,089		$3,089	$2,811	**$ 2,811**
October	$2,325	$2,805		$2,805	$2,565	**$ 2,565**
November	$2,193	$2,451		$2,451	$2,322	**$ 2,322**
December	$2,016	$2,429		$2,429	$2,222	**$ 2,222**
Annual				**$32,248**	**$30,170**	**$ 30,170**

Site Name: West Lake and Anne Kolb Park
Service Address:
Square Feet: 20,776

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	115	121	120	120	121	**121**
February	106	127	118	118	123	**123**
March	107	125	110	110	118	**118**
April	124	135	116	116	126	**126**
May	136	124	118	118	121	**121**
June	131	131	118	118	125	**125**
July	152	140	128	128	134	**134**
August	163	139		139	151	**151**
September	151	143		143	147	**147**
October	137	132		132	135	**135**
November	134	134		134	134	**134**
December	142	127		127	135	**135**
Annual				**1,503**	**1,567**	**1,567**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	36,787	48,358	41,764	41,764	45,061	**45,061**
February	33,372	37,038	33,216	33,216	35,127	**35,127**
March	31,665	37,386	35,797	35,797	36,592	**36,592**
April	39,505	46,931	37,395	37,395	42,163	**42,163**
May	45,440	48,050	43,712	43,712	45,881	**45,881**
June	51,930	51,201	50,649	50,649	50,925	**50,925**
July	55,582	64,389	58,348	58,348	61,369	**61,369**
August	58,007	63,400		63,400	60,704	**60,704**
September	54,350	61,727		61,727	58,039	**58,039**
October	51,390	52,220		52,220	51,805	**51,805**
November	51,532	45,748		45,748	48,640	**48,640**
December	49,023	40,334		40,334	44,679	**44,679**
Annual				**564,310**	**580,983**	**580,983**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$3,607	$4,069	$3,782	$3,782	$3,925	**$ 3,925**
February	$3,301	$3,502	$3,279	$3,279	$3,391	**$ 3,391**
March	$3,215	$3,513	$3,433	$3,433	$3,473	**$ 3,473**
April	$3,886	$4,024	$3,596	$3,596	$3,810	**$ 3,810**
May	$4,234	$3,965	$3,998	$3,998	$3,981	**$ 3,981**
June	$4,206	$3,945	$4,262	$4,262	$4,104	**$ 4,104**
July	$5,102	$5,143	$5,152	$5,152	$5,147	**$ 5,147**
August	$5,273	$5,130		$5,130	$5,201	**$ 5,201**
September	$5,124	$5,020		$5,020	$5,072	**$ 5,072**
October	$4,575	$4,254		$4,254	$4,415	**$ 4,415**
November	$4,548	$3,925		$3,925	$4,236	**$ 4,236**
December	$4,494	$3,569		$3,569	$4,032	**$ 4,032**
Annual				**$49,399**	**$50,787**	**$ 50,787**

Site Name: Brian Piccolo Park
Service Address:
Square Feet: 11,706

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	516	570	540	540	555	**555**
February	575	548	608	608	578	**578**
March	568	623	611	611	617	**617**
April	567	625	603	603	614	**614**
May	577	606	598	598	602	**602**
June	539	608	14	14	311	**311**
July	470	598	65	65	332	**332**
August	478	569		569	524	**524**
September	573	560		560	567	**567**
October	585	558		558	572	**572**
November	588	523		523	556	**556**
December	572	564		564	568	**568**
Annual				**5,813**	**6,394**	**6,394**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	43,454	36,902	42,834	42,834	39,868	**39,868**
February	43,783	37,379	52,470	52,470	44,925	**44,925**
March	49,558	44,577	55,355	55,355	49,966	**49,966**
April	45,058	43,570	42,510	42,510	43,040	**43,040**
May	32,917	43,006	30,151	30,151	36,579	**36,579**
June	31,542	29,990	28,851	28,851	29,421	**29,421**
July	37,930	28,061	32,717	32,717	30,389	**30,389**
August	32,041	33,597		33,597	32,819	**32,819**
September	25,802	31,608		31,608	28,705	**28,705**
October	32,522	35,039		35,039	33,781	**33,781**
November	39,256	46,790		46,790	43,023	**43,023**
December	39,586	43,313		43,313	41,450	**41,450**
Annual				**475,235**	**453,964**	**453,964**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$8,563	$8,277	$8,673	$8,673	$8,475	**$ 8,475**
February	$9,235	$8,062	$9,962	$9,962	$9,012	**$ 9,012**
March	$9,536	$9,270	$10,295	$10,295	$9,783	**$ 9,783**
April	$9,248	$9,289	$9,455	$9,455	$9,372	**$ 9,372**
May	$8,521	$9,046	$8,669	$8,669	$8,857	**$ 8,857**
June	$2,539	$1,886	$1,908	$1,908	$1,897	**$ 1,897**
July	$2,960	$2,319	$2,758	$2,758	$2,539	**$ 2,539**
August	$2,878	$2,934		$2,934	$2,906	**$ 2,906**
September	$2,859	$2,356		$2,356	$2,607	**$ 2,607**
October	$7,796	$8,099		$8,099	$7,948	**$ 7,948**
November	$8,990	$8,321		$8,321	$8,656	**$ 8,656**
December	$8,828	$8,591		$8,591	$8,710	**$ 8,710**
Annual				**$82,022**	**$80,761**	**$ 80,761**

Site Name: Fern Forest Park
Service Address:
Square Feet: 9,893

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	49	40	25	25	33	**33**
February	51	37	27	27	32	**32**
March	55	26	29	29	28	**28**
April	50	36	29	29	33	**33**
May	48	29	25	25	27	**27**
June	49	26	29	29	28	**28**
July	44	33	35	35	34	**34**
August	51	28		28	40	**40**
September	48	35		35	42	**42**
October	50	29		29	40	**40**
November	55	31		31	43	**43**
December	47	24		24	36	**36**
Annual				**346**	**412**	**412**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	7,439	6,763	7,867	7,867	7,315	**7,315**
February	7,236	6,662	6,842	6,842	6,752	**6,752**
March	8,367	6,892	7,169	7,169	7,031	**7,031**
April	8,660	8,113	6,879	6,879	7,496	**7,496**
May	8,403	8,589	8,027	8,027	8,308	**8,308**
June	9,541	8,516	9,022	9,022	8,769	**8,769**
July	10,833	10,543	11,566	11,566	11,055	**11,055**
August	9,870	9,013		9,013	9,442	**9,442**
September	11,324	8,198		8,198	9,761	**9,761**
October	8,477	7,964		7,964	8,221	**8,221**
November	9,295	6,703		6,703	7,999	**7,999**
December	7,836	6,972		6,972	7,404	**7,404**
Annual				**96,222**	**99,551**	**99,551**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$1,052	$855	$817	$817	$836	**$ 836**
February	$1,063	$816	$780	$780	$798	**$ 798**
March	$1,180	$746	$841	$841	$793	**$ 793**
April	$1,140	$909	$833	$833	$871	**$ 871**
May	$1,075	$895	$867	$867	$881	**$ 881**
June	$1,152	$830	$948	$948	$889	**$ 889**
July	$1,170	$1,028	$1,198	$1,198	$1,113	**$ 1,113**
August	$1,195	$907		$907	$1,051	**$ 1,051**
September	$1,240	$900		$900	$1,070	**$ 1,070**
October	$1,101	$809		$809	$955	**$ 955**
November	$1,205	$775		$775	$990	**$ 990**
December	$1,030	$725		$725	$877	**$ 877**
Annual				**$10,398**	**$11,124**	**$ 11,124**

Site Name: Plantation Heritage Park
Service Address:
Square Feet: 7,674

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

	Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	63	16	19	19	18	**18**
February	57	68	54	54	61	**61**
March	81	76	66	66	71	**71**
April	83	76	76	76	76	**76**
May	83	84	21	21	53	**53**
June	81	72	23	23	48	**48**
July	87	82	27	27	55	**55**
August	72	85		85	79	**79**
September	70	84		84	77	**77**
October	27	81		81	54	**54**
November	28	66		66	47	**47**
December	65	55		55	60	**60**
Annual				**657**	**697**	**697**

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	18,261	12,281	10,034	10,034	11,158	**11,158**
February	10,249	14,145	9,355	9,355	11,750	**11,750**
March	18,485	17,791	10,295	10,295	14,043	**14,043**
April	21,354	20,226	11,436	11,436	15,831	**15,831**
May	24,209	21,313	11,554	11,554	16,434	**16,434**
June	20,845	20,343	11,703	11,703	16,023	**16,023**
July	19,078	24,032	11,048	11,048	17,540	**17,540**
August	23,549	23,802		23,802	23,676	**23,676**
September	17,999	19,481		19,481	18,740	**18,740**
October	12,493	17,704		17,704	15,099	**15,099**
November	12,641	17,574		17,574	15,108	**15,108**
December	15,363	13,703		13,703	14,533	**14,533**
Annual				**167,689**	**189,933**	**189,933**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	$2,043	$1,118	$1,021	$1,021	$1,070	**$ 1,070**
February	$1,496	$1,751	$1,360	$1,360	$1,556	**$ 1,556**
March	$2,207	$1,968	$1,587	$1,587	$1,777	**$ 1,777**
April	$2,376	$1,996	$1,800	$1,800	$1,898	**$ 1,898**
May	$2,539	$2,013	$1,203	$1,203	$1,608	**$ 1,608**
June	$2,313	$1,981	$1,197	$1,197	$1,589	**$ 1,589**
July	$2,050	$2,216	$1,215	$1,215	$1,715	**$ 1,715**
August	$2,340	$2,475		$2,475	$2,407	**$ 2,407**
September	$2,019	$1,921		$1,921	$1,970	**$ 1,970**
October	$1,312	$1,802		$1,802	$1,557	**$ 1,557**
November	$1,247	$1,840		$1,840	$1,543	**$ 1,543**
December	$1,915	$1,546		$1,546	$1,730	**$ 1,730**
Annual				**$18,966**	**$20,421**	**$ 20,421**

Site Name: Secret Woods Park
Service Address:
Square Feet: 7,257

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	26	31	32	32	32	**32**
February	25	32	29	29	31	**31**
March	31	32	30	30	31	**31**
April	38	38	38	38	38	**38**
May	42	37	37	37	37	**37**
June	39	40	38	38	39	**39**
July	37	43	39	39	41	**41**
August	40	35		35	38	**38**
September	38	39		39	39	**39**
October	33	37		37	35	**35**
November	31	30		30	31	**31**
December	34	27		27	31	**31**
Annual				**411**	**420**	**420**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	6,670	6,707	6,368	6,368	6,538	**6,538**
February	5,197	6,480	4,975	4,975	5,728	**5,728**
March	7,961	9,416	6,175	6,175	7,796	**7,796**
April	8,889	9,210	9,028	9,028	9,119	**9,119**
May	10,959	9,032	9,649	9,649	9,341	**9,341**
June	11,133	9,980	10,110	10,110	10,045	**10,045**
July	11,659	13,564	10,609	10,609	12,087	**12,087**
August	12,379	11,834		11,834	12,107	**12,107**
September	10,969	10,214		10,214	10,592	**10,592**
October	9,982	5,535		5,535	7,759	**7,759**
November	9,696	5,238		5,238	7,467	**7,467**
December	8,543	5,970		5,970	7,257	**7,257**
Annual				**95,705**	**105,832**	**105,832**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$786	$779	$798	$798	$788	**$ 788**
February	$676	$772	$678	$678	$725	**$ 725**
March	$917	$943	$771	$771	$857	**$ 857**
April	$1,051	$993	$1,034	$1,034	$1,013	**$ 1,013**
May	$1,195	$963	$1,054	$1,054	$1,009	**$ 1,009**
June	$1,164	$1,047	$1,085	$1,085	$1,066	**$ 1,066**
July	$1,172	$1,268	$1,123	$1,123	$1,196	**$ 1,196**
August	$1,248	$1,086		$1,086	$1,167	**$ 1,167**
September	$1,136	$1,009		$1,009	$1,073	**$ 1,073**
October	$1,018	$748		$748	$883	**$ 883**
November	$975	$667		$667	$821	**$ 821**
December	$946	$680		$680	$813	**$ 813**
Annual				**$10,734**	**$11,412**	**$ 11,412**

Site Name: Hollywood North Beach
Service Address:
Square Feet: 4,000

Electric History

Account: Various
Meter: Various
Rate: Various
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	0	0	0	0	**0**
February	0	0	0	0	0	**0**
March	0	0	0	0	0	**0**
April	0	0	0	0	0	**0**
May	0	0	0	0	0	**0**
June	0	0	0	0	0	**0**
July	0	0	0	0	0	**0**
August	0	0		0	0	**0**
September	0	0		0	0	**0**
October	0	0		0	0	**0**
November	0	0		0	0	**0**
December	0	0		0	0	**0**
Annual				**0**	**0**	**0**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	6,436	8,079	3,559	3,559	5,819	**5,819**
February	6,300	6,707	3,523	3,523	5,115	**5,115**
March	6,173	6,416	4,161	4,161	5,289	**5,289**
April	7,627	5,309	3,471	3,471	4,390	**4,390**
May	7,723	5,411	3,978	3,978	4,695	**4,695**
June	8,896	5,827	4,294	4,294	5,061	**5,061**
July	9,133	6,301	5,188	5,188	5,745	**5,745**
August	8,970	6,709		6,709	7,840	**7,840**
September	8,654	6,633		6,633	7,644	**7,644**
October	7,462	6,422		6,422	6,942	**6,942**
November	7,396	3,394		3,394	5,395	**5,395**
December	7,191	3,161		3,161	5,176	**5,176**
Annual				**54,493**	**69,108**	**69,108**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$849	$976	$381	$381	$679	**$ 679**
February	$835	$841	$378	$378	$609	**$ 609**
March	$831	$817	$455	$455	$636	**$ 636**
April	$980	$701	$381	$381	$541	**$ 541**
May	$967	$711	$433	$433	$572	**$ 572**
June	$1,088	$753	$465	$465	$609	**$ 609**
July	$1,112	$799	$556	$556	$677	**$ 677**
August	$1,096	$839		$839	$967	**$ 967**
September	$1,054	$827		$827	$941	**$ 941**
October	$933	$806		$806	$870	**$ 870**
November	$930	$353		$353	$642	**$ 642**
December	$910	$331		$331	$620	**$ 620**
Annual				**$6,204**	**$8,363**	**$ 8,363**

Site Name: African American Library
Service Address: 2650 NW 6TH ST FORT LAUDERDALE FL, 33311
Square Feet: 61,150

Electric History

Account: 7733748565
Meter: MV76938
Rate: GSDT-1
Baseline: Average of Last Two Years

	On-Peak Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		310	240	240	275	**275**
February		295	250	250	273	**273**
March		300	295	295	298	**298**
April		300	278	278	289	**289**
May		374	346	346	360	**360**
June		334	334	334	334	**334**
July		358	329	329	344	**344**
August		338	341	341	340	**340**
September		324	338	338	331	**331**
October	382	336	470	470	403	**403**
November	358	353	214	214	284	**284**
December	329	319		319	324	**324**
Annual				**3,754**	**3,853**	**3,853**

	On-Peak Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		25,920	26,160	26,160	26,040	**26,040**
February		24,000	22,800	22,800	23,400	**23,400**
March		28,800	25,920	25,920	27,360	**27,360**
April		42,480	37,920	37,920	40,200	**40,200**
May		46,080	47,760	47,760	46,920	**46,920**
June		48,000	51,360	51,360	49,680	**49,680**
July		50,160	41,760	41,760	45,960	**45,960**
August		52,320	47,040	47,040	49,680	**49,680**
September		46,800	36,480	36,480	41,640	**41,640**
October	48,240	44,640	46,320	46,320	45,480	**45,480**
November	35,520	33,360	25,680	25,680	29,520	**29,520**
December	33,120	31,680		31,680	32,400	**32,400**
Annual				**440,880**	**458,280**	**458,280**

	Off-Peak Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		104,160	93,120	93,120	98,640	**98,640**
February		88,560	80,880	80,880	84,720	**84,720**
March		109,200	99,600	99,600	104,400	**104,400**
April		94,080	84,720	84,720	89,400	**89,400**
May		91,680	92,640	92,640	92,160	**92,160**
June		98,880	116,880	116,880	107,880	**107,880**
July		112,800	99,840	99,840	106,320	**106,320**
August		97,680	108,240	108,240	102,960	**102,960**
September		104,880	97,200	97,200	101,040	**101,040**
October	101,040	89,760	106,080	106,080	97,920	**97,920**
November	111,120	100,800	93,360	93,360	97,080	**97,080**
December	140,880	120,720		120,720	130,800	**130,800**
Annual				**1,193,280**	**1,213,320**	**1,213,320**

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	0	130,080	119,280	119,280	124,680	**124,680**
February	0	112,560	103,680	103,680	108,120	**108,120**
March	0	138,000	125,520	125,520	131,760	**131,760**
April	0	136,560	122,640	122,640	129,600	**129,600**
May	0	137,760	140,400	140,400	139,080	**139,080**
June	0	146,880	168,240	168,240	157,560	**157,560**
July	0	162,960	141,600	141,600	152,280	**152,280**
August	0	150,000	155,280	155,280	152,640	**152,640**
September	0	151,680	133,680	133,680	142,680	**142,680**
October	149,280	134,400	152,400	152,400	143,400	**143,400**
November	146,640	134,160	119,040	119,040	126,600	**126,600**
December	174,000	152,400	0	152,400	163,200	**163,200**
Annual				**1,634,160**	**1,671,600**	**1,671,600**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		$9,803	$8,886	$8,886	$9,345	**$ 9,345**
February		$8,851	$8,194	$8,194	$8,523	**$ 8,523**
March		$10,180	$10,071	$10,071	$10,125	**$ 10,125**
April		$10,402	$10,207	$10,207	$10,304	**$ 10,304**
May		$11,429	$12,161	$12,161	$11,795	**$ 11,795**
June		$11,425	$13,439	$13,439	$12,432	**$ 12,432**
July		$12,396	$11,800	$11,800	$12,098	**$ 12,098**
August		$11,780	$12,762	$12,762	$12,271	**$ 12,271**
September		$11,415	$11,335	$11,335	$11,375	**$ 11,375**
October	$12,807	$10,802	$14,056	$14,056	$12,429	**$ 12,429**
November	$11,594	$10,480	$8,854	$8,854	$9,667	**$ 9,667**
December	$12,561	$10,715		$10,715	$11,638	**$ 11,638**
Annual				**$132,479**	**$132,002**	**$ 132,002**

Site Name: West Regional Library
Service Address: 8601 W BROWARD BLVD #LIBR PLANTATION FL, 33324
Square Feet: 72,000

Electric History

Account: 7522132211
Meter: RV713V0
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	269	252	271	271	262	**262**
February	235	240	264	264	252	**252**
March	250	240	245	245	243	**243**
April	259	269	233	233	251	**251**
May	298	276	254	254	265	**265**
June	288	302	355	355	329	**329**
July	290	300	326	326	313	**313**
August	293	314	290	290	302	**302**
September	283	312	274	274	293	**293**
October	257	302	314	314	308	**308**
November	238	242	245	245	244	**244**
December	230	242		242	236	**236**
Annual				**3,313**	**3,296**	**3,296**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	128,880	143,760	119,520	119,520	131,640	**131,640**
February	107,520	126,960	102,720	102,720	114,840	**114,840**
March	110,400	135,840	93,600	93,600	114,720	**114,720**
April	124,080	122,640	91,200	91,200	106,920	**106,920**
May	126,720	104,640	96,000	96,000	100,320	**100,320**
June	121,440	117,600	120,720	120,720	119,160	**119,160**
July	131,520	121,680	118,560	118,560	120,120	**120,120**
August	122,400	123,360	133,200	133,200	128,280	**128,280**
September	129,600	115,440	135,120	135,120	125,280	**125,280**
October	116,880	101,040	119,760	119,760	110,400	**110,400**
November	118,080	116,160	89,280	89,280	102,720	**102,720**
December	121,680	120,480		120,480	121,080	**121,080**
Annual				**1,340,160**	**1,395,480**	**1,395,480**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$10,843	$10,709	$9,836	$9,836	$10,272	**$ 10,272**
February	$9,172	$9,652	$8,815	$8,815	$9,233	**$ 9,233**
March	$9,558	$10,170	$8,320	$8,320	$9,245	**$ 9,245**
April	$10,486	$9,407	$8,042	$8,042	$8,724	**$ 8,724**
May	$10,698	$8,556	$8,564	$8,564	$8,560	**$ 8,560**
June	$10,291	$9,529	$11,178	$11,178	$10,353	**$ 10,353**
July	$10,890	$9,717	$10,717	$10,717	$10,217	**$ 10,217**
August	$10,403	$9,963	$11,159	$11,159	$10,561	**$ 10,561**
September	$10,656	$9,509	$11,084	$11,084	$10,296	**$ 10,296**
October	$9,633	$8,653	$10,647	$10,647	$9,650	**$ 9,650**
November	$9,482	$8,753	$8,070	$8,070	$8,411	**$ 8,411**
December	$9,594	$8,976		$8,976	$9,285	**$ 9,285**
Annual				**$115,407**	**$114,809**	**$ 114,809**

Site Name: Northwest Regional Library
Service Address: 3203 N UNIVERSITY DR # LIBRARY CORAL SPRINGS FL, 33065
Square Feet: 72,000

Electric History

Account: 3055947497
Meter: KV78257
Rate: GSD-1
Baseline: Average of Last Two Years

	Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	238	264	314	314	289	**289**
February	216	269	322	322	296	**296**
March	352	310	310	310	310	**310**
April	338	319	336	336	328	**328**
May	418	418	422	422	420	**420**
June	427	415	355	355	385	**385**
July	379	427	276	276	352	**352**
August	422	365	278	278	322	**322**
September	422	358	374	374	366	**366**
October	403	362	317	317	340	**340**
November	360	355	238	238	297	**297**
December	374	312		312	343	**343**
Annual				**3,854**	**4,045**	**4,045**

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	94,800	104,880	108,000	108,000	106,440	**106,440**
February	74,160	84,960	90,720	90,720	87,840	**87,840**
March	103,440	102,000	92,640	92,640	97,320	**97,320**
April	105,840	116,160	107,760	107,760	111,960	**111,960**
May	127,920	118,320	114,720	114,720	116,520	**116,520**
June	125,040	132,240	132,240	132,240	132,240	**132,240**
July	130,080	151,920	119,040	119,040	135,480	**135,480**
August	141,840	152,400	117,840	117,840	135,120	**135,120**
September	139,920	155,520	112,800	112,800	134,160	**134,160**
October	125,760	118,560	128,880	128,880	123,720	**123,720**
November	120,720	100,080	107,520	107,520	103,800	**103,800**
December	120,960	102,000		102,000	111,480	**111,480**
Annual				**1,334,160**	**1,396,080**	**1,396,080**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	$8,444	$8,699	$9,687	$9,687	$9,193	**$ 9,193**
February	$6,954	$7,657	$8,812	$8,812	$8,235	**$ 8,235**
March	$10,315	$9,068	$9,013	$9,013	$9,041	**$ 9,041**
April	$10,298	$9,638	$10,192	$10,192	$9,915	**$ 9,915**
May	$12,151	$10,871	$11,589	$11,589	$11,230	**$ 11,230**
June	$12,100	$11,567	$11,846	$11,846	$11,706	**$ 11,706**
July	$11,834	$12,721	$10,164	$10,164	$11,443	**$ 11,443**
August	$13,003	$12,044	$10,117	$10,117	$11,080	**$ 11,080**
September	$12,846	$12,097	$10,926	$10,926	$11,512	**$ 11,512**
October	$11,822	$10,236	$11,209	$11,209	$10,723	**$ 10,723**
November	$11,039	$9,204	$9,051	$9,051	$9,128	**$ 9,128**
December	$11,214	$8,816		$8,816	$10,015	**$ 10,015**
Annual				**$121,422**	**$123,220**	**$ 123,220**

Site Name: Weston Branch Library
Service Address: 3900 BONAVENTURE BLVD WESTON FL, 33326
Square Feet: 51,000

Electric History

Account: 1990357467
Meter: KV51568
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	291	306	247	247	277	**277**
February	266	247	260	260	254	**254**
March	299	299	290	290	295	**295**
April	306	337	247	247	292	**292**
May	325	283	259	259	271	**271**
June	307	359	282	282	321	**321**
July	318	317	322	322	320	**320**
August	308	336	317	317	327	**327**
September	323	313	287	287	300	**300**
October	318	272	278	278	275	**275**
November	302	256	268	268	262	**262**
December	288	246		246	267	**267**
Annual				**3,303**	**3,458**	**3,458**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	103,680	93,000	85,320	85,320	89,160	**89,160**
February	90,120	72,960	83,880	83,880	78,420	**78,420**
March	99,480	95,040	84,360	84,360	89,700	**89,700**
April	110,160	91,680	81,480	81,480	86,580	**86,580**
May	112,080	83,520	82,800	82,800	83,160	**83,160**
June	116,160	98,760	107,880	107,880	103,320	**103,320**
July	126,120	108,360	103,800	103,800	106,080	**106,080**
August	120,840	110,640	98,040	98,040	104,340	**104,340**
September	126,360	99,000	93,480	93,480	96,240	**96,240**
October	111,000	85,560	93,240	93,240	89,400	**89,400**
November	106,800	87,600	79,200	79,200	83,400	**83,400**
December	98,880	85,560		85,560	92,220	**92,220**
Annual				**1,079,040**	**1,102,020**	**1,102,020**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$9,578	$8,503	$7,650	$7,650	$8,076	**$ 8,076**
February	$8,479	$6,751	$7,719	$7,719	$7,235	**$ 7,235**
March	$9,456	$8,559	$8,303	$8,303	$8,431	**$ 8,431**
April	$10,180	$8,573	$7,639	$7,639	$8,106	**$ 8,106**
May	$10,164	$7,540	$7,854	$7,854	$7,697	**$ 7,697**
June	$10,198	$9,195	$9,590	$9,590	$9,393	**$ 9,393**
July	$10,894	$9,216	$9,813	$9,813	$9,515	**$ 9,515**
August	$10,477	$9,549	$9,418	$9,418	$9,484	**$ 9,484**
September	$10,923	$8,669	$8,803	$8,803	$8,736	**$ 8,736**
October	$9,992	$7,512	$8,686	$8,686	$8,099	**$ 8,099**
November	$9,574	$7,443	$7,749	$7,749	$7,596	**$ 7,596**
December	$8,962	$7,224		$7,224	$8,093	**$ 8,093**
Annual				**$100,447**	**$100,460**	**$ 100,460**

Site Name: Lauderdale Lakes Library
Service Address:
Square Feet: 20,237

Electric History

Account: 5516195251
Meter: KV35196
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	69	65	70	70	68	**68**
February	76	49	64	64	57	**57**
March	67	58	88	88	73	**73**
April	71	75	83	83	79	**79**
May	73	77	77	77	77	**77**
June	78	82	124	124	103	**103**
July	99	90	86	86	88	**88**
August	116	116	88	88	102	**102**
September	90	157	89	89	123	**123**
October	70	146	86	86	116	**116**
November	66	97	94	94	96	**96**
December	67	73		73	70	**70**
Annual				**1,022**	**1,051**	**1,051**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	23,460	24,840	23,040	23,040	23,940	**23,940**
February	27,240	18,900	19,980	19,980	19,440	**19,440**
March	22,140	18,660	20,820	20,820	19,740	**19,740**
April	26,820	24,360	22,020	22,020	23,190	**23,190**
May	30,120	23,520	23,340	23,340	23,430	**23,430**
June	30,660	28,740	25,560	25,560	27,150	**27,150**
July	36,120	33,960	32,040	32,040	33,000	**33,000**
August	36,480	35,520	29,460	29,460	32,490	**32,490**
September	28,500	39,000	29,880	29,880	34,440	**34,440**
October	23,880	31,140	26,280	26,280	28,710	**28,710**
November	24,720	26,340	23,700	23,700	25,020	**25,020**
December	23,100	22,620		22,620	22,860	**22,860**
Annual				**298,740**	**313,410**	**313,410**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$2,222	$2,104	$2,123	$2,123	$2,113	**$ 2,113**
February	$2,529	$1,601	$1,882	$1,882	$1,742	**$ 1,742**
March	$2,128	$1,690	$2,258	$2,258	$1,974	**$ 1,974**
April	$2,456	$2,130	$2,270	$2,270	$2,200	**$ 2,200**
May	$2,584	$2,110	$2,278	$2,278	$2,194	**$ 2,194**
June	$2,675	$2,438	$2,951	$2,951	$2,695	**$ 2,695**
July	$3,229	$2,799	$2,892	$2,892	$2,845	**$ 2,845**
August	$3,446	$3,174	$2,764	$2,764	$2,969	**$ 2,969**
September	$2,680	$3,812	$2,800	$2,800	$3,306	**$ 3,306**
October	$2,187	$3,282	$2,555	$2,555	$2,918	**$ 2,918**
November	$2,188	$2,479	$2,496	$2,496	$2,488	**$ 2,488**
December	$2,108	$2,015		$2,015	$2,062	**$ 2,062**
Annual				**$29,284**	**$29,505**	**$ 29,505**

Site Name: Stirling Road Library
Service Address: 3151 STIRLING RD FORT LAUDERDALE FL, 33312
Square Feet: 20,000

Electric History

Account: 2921100182
Meter: DNL710A
Rate: SDTR-1A
Baseline: Average of Last Two Years

	High Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		77	72	72	75	**75**
February		84	72	72	78	**78**
March		84	73	73	79	**79**
April		74	83	83	79	**79**
May		0	0	0	0	**0**
June		76	97	97	87	**87**
July		87	119	119	103	**103**
August		86	118	118	102	**102**
September		84	127	127	106	**106**
October		83	113	113	98	**98**
November		72	104	104	88	**88**
December	108	83		83	96	**96**
Annual				**1,061**	**988**	**988**

	On-Peak Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		76	97	97	87	**87**
July		87	119	119	103	**103**
August		86	118	118	102	**102**
September		79	105	105	92	**92**
October		0	0	0	0	**0**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**439**	**384**	**384**

	On-Peak Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		4,215	4,947	4,947	4,581	**4,581**
July		4,377	5,047	5,047	4,712	**4,712**
August		4,789	5,324	5,324	5,057	**5,057**
September		4,262	4,016	4,016	4,139	**4,139**
October		0	0	0	0	**0**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**19,334**	**18,489**	**18,489**

	Off-Peak Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		26,714	28,326	28,326	27,520	**27,520**
February		23,867	27,221	27,221	25,544	**25,544**
March		28,582	29,790	29,790	29,186	**29,186**
April		28,547	31,172	31,172	29,860	**29,860**
May		28,636	35,494	35,494	32,065	**32,065**
June		27,733	42,167	42,167	34,950	**34,950**
July		35,149	41,489	41,489	38,319	**38,319**
August		33,527	37,798	37,798	35,663	**35,663**
September		34,612	33,250	33,250	33,931	**33,931**
October		32,450	34,214	34,214	33,332	**33,332**
November		29,827	31,878	31,878	30,853	**30,853**
December	36,839	34,424		34,424	35,632	**35,632**
Annual				**407,223**	**386,853**	**386,853**

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	0	26,714	28,326	28,326	27,520	**27,520**
February	0	23,867	27,221	27,221	25,544	**25,544**
March	0	28,582	29,790	29,790	29,186	**29,186**
April	0	28,547	31,172	31,172	29,860	**29,860**
May	0	28,636	35,494	35,494	32,065	**32,065**
June	0	31,948	47,114	47,114	39,531	**39,531**
July	0	39,526	46,536	46,536	43,031	**43,031**
August	0	38,316	43,122	43,122	40,719	**40,719**
September	0	38,874	37,266	37,266	38,070	**38,070**
October	0	32,450	34,214	34,214	33,332	**33,332**
November	0	29,827	31,878	31,878	30,853	**30,853**
December	36,839	34,424	0	34,424	35,632	**35,632**
Annual				**426,557**	**405,342**	**405,342**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		$2,318	$2,420	$2,420	$2,369	**$ 2,369**
February		$2,241	$2,426	$2,426	$2,334	**$ 2,334**
March		$2,427	$2,588	$2,588	$2,507	**$ 2,507**
April		$2,315	$2,781	$2,781	$2,548	**$ 2,548**
May		$1,250	$1,821	$1,821	$1,536	**$ 1,536**
June		$2,743	$4,053	$4,053	$3,398	**$ 3,398**
July		$3,221	$4,308	$4,308	$3,765	**$ 3,765**
August		$3,187	$4,146	$4,146	$3,667	**$ 3,667**
September		$2,954	$3,631	$3,631	$3,293	**$ 3,293**
October		$2,612	$3,296	$3,296	$2,954	**$ 2,954**
November		$2,356	$3,058	$3,058	$2,707	**$ 2,707**
December	$3,206	$2,882		$2,882	$3,044	**$ 3,044**
Annual				**$37,411**	**$34,121**	**$ 34,121**

Site Name: North Lauderdale Library
Service Address:
Square Feet: 20,000

Electric History

Account: 1182111235
Meter: KV31114
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	103	84	101	101	93	**93**
February	93	92	109	109	101	**101**
March	104	113	128	128	121	**121**
April	117	113	105	105	109	**109**
May	128	121	130	130	126	**126**
June	118	100	145	145	123	**123**
July	130	108	148	148	128	**128**
August	125	124	154	154	139	**139**
September	119	108	145	145	127	**127**
October	118	109	129	129	119	**119**
November	115	105	138	138	122	**122**
December	106	108		108	107	**107**
Annual				**1,540**	**1,412**	**1,412**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	22,140	27,720	54,720	54,720	41,220	**41,220**
February	19,920	22,020	52,860	52,860	37,440	**37,440**
March	21,360	29,640	42,420	42,420	36,030	**36,030**
April	24,480	35,280	35,520	35,520	35,400	**35,400**
May	26,940	38,340	37,260	37,260	37,800	**37,800**
June	27,840	46,380	39,060	39,060	42,720	**42,720**
July	31,380	45,600	43,080	43,080	44,340	**44,340**
August	31,860	48,840	38,760	38,760	43,800	**43,800**
September	31,140	48,480	37,740	37,740	43,110	**43,110**
October	28,140	50,760	37,920	37,920	44,340	**44,340**
November	26,580	51,540	35,580	35,580	43,560	**43,560**
December	27,540	54,900		54,900	41,220	**41,220**
Annual				**509,820**	**490,980**	**490,980**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$2,538	$2,474	$4,256	$4,256	$3,365	**$ 3,365**
February	$2,289	$2,247	$4,244	$4,244	$3,246	**$ 3,246**
March	$2,510	$2,905	$3,985	$3,985	$3,445	**$ 3,445**
April	$2,849	$3,128	$3,316	$3,316	$3,222	**$ 3,222**
May	$3,040	$3,377	$3,706	$3,706	$3,542	**$ 3,542**
June	$2,978	$3,558	$3,982	$3,982	$3,770	**$ 3,770**
July	$3,319	$3,609	$4,252	$4,252	$3,930	**$ 3,930**
August	$3,289	$3,958	$4,069	$4,069	$4,013	**$ 4,013**
September	$3,168	$3,749	$3,904	$3,904	$3,827	**$ 3,827**
October	$2,985	$3,878	$3,730	$3,730	$3,804	**$ 3,804**
November	$2,862	$3,873	$3,697	$3,697	$3,785	**$ 3,785**
December	$2,813	$4,080		$4,080	$3,447	**$ 3,447**
Annual				**$47,222**	**$43,395**	**$ 43,395**

Site Name: Dan Pearl (Sunrise) Library
Service Address: 10500 W OAKLAND PARK BLVD SUNRISE FL
Square Feet: 19,500

Electric History

Account: 1803471430
Meter: RU391VV0
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	105	94	92	92	93	**93**
February	103	91	103	103	97	**97**
March	113	114	91	91	103	**103**
April	139	122	103	103	113	**113**
May	117	121	107	107	114	**114**
June	116	124	105	105	115	**115**
July	123	123	105	105	114	**114**
August	126	122	104	104	113	**113**
September	123	120	84	84	102	**102**
October	122	115	98	98	107	**107**
November	123	119	86	86	103	**103**
December	111	112		112	112	**112**
Annual				**1,190**	**1,283**	**1,283**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	37,560	25,980	33,060	33,060	29,520	**29,520**
February	31,860	23,700	36,120	36,120	29,910	**29,910**
March	39,780	34,440	39,960	39,960	37,200	**37,200**
April	44,820	35,820	37,680	37,680	36,750	**36,750**
May	41,340	33,240	40,620	40,620	36,930	**36,930**
June	39,720	35,820	30,600	30,600	33,210	**33,210**
July	44,880	40,500	32,700	32,700	36,600	**36,600**
August	46,140	36,240	40,620	40,620	38,430	**38,430**
September	43,080	37,140	30,600	30,600	33,870	**33,870**
October	40,260	28,800	32,700	32,700	30,750	**30,750**
November	37,800	27,780	23,940	23,940	25,860	**25,860**
December	37,920	33,420		33,420	35,670	**35,670**
Annual				**412,020**	**404,700**	**404,700**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$3,482	$2,485	$2,698	$2,698	$2,592	**$ 2,592**
February	$3,117	$2,327	$2,768	$2,768	$2,547	**$ 2,547**
March	$3,722	$3,179	$3,029	$3,029	$3,104	**$ 3,104**
April	$4,326	$3,255	$3,146	$3,146	$3,201	**$ 3,201**
May	$3,733	$3,110	$3,371	$3,371	$3,241	**$ 3,241**
June	$3,632	$3,280	$3,574	$3,574	$3,427	**$ 3,427**
July	$4,007	$3,511	$3,441	$3,441	$3,476	**$ 3,476**
August	$4,114	$3,466	$3,601	$3,601	$3,533	**$ 3,533**
September	$3,890	$3,696	$2,784	$2,784	$3,240	**$ 3,240**
October	$3,718	$3,101	$3,068	$3,068	$3,084	**$ 3,084**
November	$3,590	$3,239	$2,418	$2,418	$2,828	**$ 2,828**
December	$3,458	$3,206		$3,206	$3,332	**$ 3,332**
Annual				**$37,104**	**$37,605**	**$ 37,605**

Site Name: Margate Library
Service Address: 5810 PARK DR #LIBRARY MARGATE FL, 33063
Square Feet: 15,800

Electric History

Account: 8005354108
Meter: DU5916A
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	77	82	77	77	80	**80**
February	83	79	79	79	79	**79**
March	79	84	78	78	81	**81**
April	88	85	83	83	84	**84**
May	89	86	83	83	85	**85**
June	86	91	80	80	86	**86**
July	84	86	74	74	80	**80**
August	85	83	91	91	87	**87**
September	80	88	77	77	83	**83**
October	78	82	85	85	84	**84**
November	82	70	90	90	80	**80**
December	78	82		82	80	**80**
Annual				**979**	**987**	**987**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	48,000	40,680	40,800	40,800	40,740	**40,740**
February	38,880	40,200	34,080	34,080	37,140	**37,140**
March	40,560	42,600	34,200	34,200	38,400	**38,400**
April	37,320	39,840	36,120	36,120	37,980	**37,980**
May	39,480	38,760	39,120	39,120	38,940	**38,940**
June	37,200	39,120	34,920	34,920	37,020	**37,020**
July	36,600	38,040	37,080	37,080	37,560	**37,560**
August	35,160	36,840	39,720	39,720	38,280	**38,280**
September	33,960	33,240	39,000	39,000	36,120	**36,120**
October	29,760	29,400	42,720	42,720	36,060	**36,060**
November	29,640	27,120	39,120	39,120	33,120	**33,120**
December	35,520	37,680		37,680	36,600	**36,600**
Annual				**454,560**	**447,960**	**447,960**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$3,784	$3,163	$3,197	$3,197	$3,180	**$ 3,180**
February	$3,307	$3,104	$2,844	$2,844	$2,974	**$ 2,974**
March	$3,377	$3,300	$2,925	$2,925	$3,112	**$ 3,112**
April	$3,285	$3,044	$3,094	$3,094	$3,069	**$ 3,069**
May	$3,303	$2,999	$3,270	$3,270	$3,134	**$ 3,134**
June	$3,141	$3,077	$2,991	$2,991	$3,034	**$ 3,034**
July	$3,084	$2,965	$3,048	$3,048	$3,007	**$ 3,007**
August	$3,013	$2,869	$3,399	$3,399	$3,134	**$ 3,134**
September	$2,875	$2,733	$3,194	$3,194	$2,964	**$ 2,964**
October	$2,613	$2,467	$3,504	$3,504	$2,985	**$ 2,985**
November	$2,653	$2,213	$3,351	$3,351	$2,782	**$ 2,782**
December	$2,941	$2,894		$2,894	$2,917	**$ 2,917**
Annual				**$37,711**	**$36,293**	**$ 36,293**

Site Name: Hallandale Library
Service Address: 310 S FEDERAL HWY HALLANDALE BEACH FL, 33009
Square Feet: 14,700

Electric History

Account: 963359922
Meter: DU3162A
Rate: SDTR-1A
Baseline: Average of Last Two Years

	High Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		52	44	44	48	**48**
February		56	56	56	56	**56**
March		55	60	60	58	**58**
April		58	67	67	63	**63**
May		59	67	67	63	**63**
June		65	66	66	66	**66**
July		68	66	66	67	**67**
August		77	72	72	75	**75**
September		71	65	65	68	**68**
October		70	68	68	69	**69**
November	64	53		0	53	**53**
December	63	57		57	60	**60**
Annual				**688**	**744**	**744**

	On-Peak Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		59	67	67	63	**63**
June		65	66	66	66	**66**
July		68	66	66	67	**67**
August		77	72	72	75	**75**
September		71	65	65	68	**68**
October		0	0	0	0	**0**
November	0	0		0	0	**0**
December	0	0		0	0	**0**
Annual				**336**	**338**	**338**

	On-Peak Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		480	420	420	450	**450**
June		3,600	3,780	3,780	3,690	**3,690**
July		3,420	3,540	3,540	3,480	**3,480**
August		3,960	3,720	3,720	3,840	**3,840**
September		2,940	2,520	2,520	2,730	**2,730**
October		0	0	0	0	**0**
November	0	0		0	0	**0**
December	0	0		0	0	**0**
Annual				**13,980**	**14,190**	**14,190**

	Off-Peak Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		18,060	21,540	21,540	19,800	**19,800**
February		22,500	23,280	23,280	22,890	**22,890**
March		24,540	23,220	23,220	23,880	**23,880**
April		24,540	23,820	23,820	24,180	**24,180**
May		28,200	28,440	28,440	28,320	**28,320**
June		26,880	27,360	27,360	27,120	**27,120**
July		25,200	28,140	28,140	26,670	**26,670**
August		31,440	26,880	26,880	29,160	**29,160**
September		24,960	22,920	22,920	23,940	**23,940**
October		25,140	28,860	28,860	27,000	**27,000**
November	23,640	24,480		0	24,480	**24,480**
December	27,300	24,720		24,720	26,010	**26,010**
Annual				**279,180**	**303,450**	**303,450**

	Total Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	18,060	21,540	21,540	19,800	**19,800**
February	0	22,500	23,280	23,280	22,890	**22,890**
March	0	24,540	23,220	23,220	23,880	**23,880**
April	0	24,540	23,820	23,820	24,180	**24,180**
May	0	28,680	28,860	28,860	28,770	**28,770**
June	0	30,480	31,140	31,140	30,810	**30,810**
July	0	28,620	31,680	31,680	30,150	**30,150**
August	0	35,400	30,600	30,600	33,000	**33,000**
September	0	27,900	25,440	25,440	26,670	**26,670**
October	0	25,140	28,860	28,860	27,000	**27,000**
November	23,640	24,480	0	0	12,240	**12,240**
December	27,300	24,720	0	24,720	26,010	**26,010**
Annual				**293,160**	**305,400**	**305,400**

	Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$1,576	$1,725	$1,725	$1,650	**$ 1,650**
February		$1,868	$2,015	$2,015	$1,941	**$ 1,941**
March		$1,900	$2,056	$2,056	$1,978	**$ 1,978**
April		$1,933	$2,170	$2,170	$2,052	**$ 2,052**
May		$2,049	$2,360	$2,360	$2,205	**$ 2,205**
June		$2,484	$2,755	$2,755	$2,620	**$ 2,620**
July		$2,427	$2,761	$2,761	$2,594	**$ 2,594**
August		$2,873	$2,797	$2,797	$2,835	**$ 2,835**
September		$2,246	$2,243	$2,243	$2,245	**$ 2,245**
October		$2,093	$2,477	$2,477	$2,285	**$ 2,285**
November	$2,088	$1,872		$0	$1,872	**$ 1,872**
December	$2,202	$2,048		$2,048	$2,125	**$ 2,125**
Annual				**$25,407**	**$26,402**	**$ 26,402**

Site Name: Century Plaza Library
Service Address: 1856 W HILLSBORO BLVD DEERFIELD BEACH FL, 33442
Square Feet: 11,682

Electric History

Account: 4695737454
Meter: AC47082
Rate: GS-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	Not Applicable			0	0	**0**
February				0	0	**0**
March				0	0	**0**
April				0	0	**0**
May				0	0	**0**
June				0	0	**0**
July				0	0	**0**
August				0	0	**0**
September				0	0	**0**
October				0	0	**0**
November				0	0	**0**
December				0	0	**0**
Annual				**0**	**0**	**0**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	994	1,164	1,312	1,312	1,238	**1,238**
February	774	668	1,158	1,158	913	**913**
March	711	822	1,300	1,300	1,061	**1,061**
April	1,174	1,294	1,673	1,673	1,484	**1,484**
May	1,430	1,252	1,455	1,455	1,354	**1,354**
June	1,629	1,566	1,952	1,952	1,759	**1,759**
July	1,650	2,247	2,055	2,055	2,151	**2,151**
August	1,513	1,650	1,928	1,928	1,789	**1,789**
September	1,545	1,668	1,590	1,590	1,629	**1,629**
October	1,286	1,324	1,438	1,438	1,381	**1,381**
November	1,125	1,514	1,070	1,070	1,292	**1,292**
December	1,091	1,231		1,231	1,161	**1,161**
Annual				**18,162**	**17,211**	**17,211**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$112	$123	$139	$139	$131	**$ 131**
February	$89	$74	$124	$124	$99	**$ 99**
March	$83	$89	$143	$143	$116	**$ 116**
April	$132	$134	$180	$180	$157	**$ 157**
May	$154	$130	$158	$158	$144	**$ 144**
June	$175	$160	$209	$209	$184	**$ 184**
July	$177	$226	$219	$219	$223	**$ 223**
August	$163	$168	$206	$206	$187	**$ 187**
September	$165	$170	$172	$172	$171	**$ 171**
October	$139	$136	$157	$157	$146	**$ 146**
November	$122	$155	$119	$119	$137	**$ 137**
December	$119	$127		$127	$123	**$ 123**
Annual				**$1,954**	**$1,819**	**$ 1,819**

Account: 5728383133
Meter: KJ91114
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	38	40	42	42	41	**41**
February	37	35	39	39	37	**37**
March	40	36	40	40	38	**38**
April	41	44	41	41	43	**43**
May	41	41	41	41	41	**41**
June	37	41	44	44	43	**43**
July	42	42	45	45	44	**44**
August	47	50	45	45	48	**48**
September	46	47	46	46	47	**47**
October	40	48	46	46	47	**47**
November	43	44	43	43	44	**44**
December	42	43		43	43	**43**
Annual				**515**	**513**	**513**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	10,808	12,687	14,090	14,090	13,389	**13,389**
February	9,280	8,060	11,678	11,678	9,869	**9,869**
March	10,327	8,800	12,091	12,091	10,446	**10,446**
April	13,432	13,549	13,618	13,618	13,584	**13,584**
May	14,331	12,668	12,184	12,184	12,426	**12,426**
June	12,538	15,298	17,452	17,452	16,375	**16,375**
July	14,872	16,683	18,093	18,093	17,388	**17,388**
August	15,596	16,253	17,027	17,027	16,640	**16,640**
September	15,438	20,906	17,142	17,142	19,024	**19,024**
October	13,036	16,760	16,146	16,146	16,453	**16,453**
November	12,611	15,071	13,577	13,577	14,324	**14,324**
December	12,274	13,849		13,849	13,062	**13,062**
Annual				**176,947**	**172,978**	**172,978**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$1,108	$1,160	$1,299	$1,299	$1,229	**$ 1,229**
February	$1,005	$850	$1,130	$1,130	$990	**$ 990**
March	$1,106	$903	$1,195	$1,195	$1,049	**$ 1,049**
April	$1,305	$1,221	$1,295	$1,295	$1,258	**$ 1,258**
May	$1,314	$1,141	$1,211	$1,211	$1,176	**$ 1,176**
June	$1,166	$1,278	$1,554	$1,554	$1,416	**$ 1,416**
July	$1,356	$1,361	$1,603	$1,603	$1,482	**$ 1,482**
August	$1,456	$1,430	$1,541	$1,541	$1,485	**$ 1,485**
September	$1,430	$1,632	$1,559	$1,559	$1,596	**$ 1,596**
October	$1,224	$1,430	$1,500	$1,500	$1,465	**$ 1,465**
November	$1,234	$1,298	$1,316	$1,316	$1,307	**$ 1,307**
December	$1,204	$1,223		$1,223	$1,213	**$ 1,213**
Annual				**$16,426**	**$15,666**	**$ 15,666**

Site Name: Dania Beach Library
Service Address: 100 W DANIA BEACH BLVD #LIBRARY DANIA FL, 33004
Square Feet: 9,970

Electric History

Account: 5774970379
Meter: MLL786A
Rate: SDTR-1A
Baseline: Average of Last Two Years

	High Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		45	40	40	43	**43**
February		46	50	50	48	**48**
March		41	44	44	43	**43**
April		37	47	47	42	**42**
May		43	40	40	42	**42**
June		46	41	41	44	**44**
July		45	31	31	38	**38**
August		44	32	32	38	**38**
September		47	32	32	40	**40**
October		46	37	37	42	**42**
November	52	41		0	41	**41**
December	42	42		42	42	**42**
Annual				**436**	**500**	**500**

	On-Peak Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		43	40	40	42	**42**
June		46	41	41	44	**44**
July		45	31	31	38	**38**
August		44	32	32	38	**38**
September		47	31	31	39	**39**
October		0	0	0	0	**0**
November	0	0		0	0	**0**
December	0	0		0	0	**0**
Annual				**175**	**200**	**200**

	On-Peak Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		654	589	589	622	**622**
June		2,403	2,060	2,060	2,232	**2,232**
July		2,420	1,783	1,783	2,102	**2,102**
August		2,557	1,797	1,797	2,177	**2,177**
September		1,778	1,062	1,062	1,420	**1,420**
October		0	0	0	0	**0**
November	0	0		0	0	**0**
December	0	0		0	0	**0**
Annual				**7,291**	**8,552**	**8,552**

	Off-Peak Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		22,486	16,984	16,984	19,735	**19,735**
February		22,588	19,270	19,270	20,929	**20,929**
March		20,926	20,299	20,299	20,613	**20,613**
April		18,384	23,115	23,115	20,750	**20,750**
May		21,173	19,678	19,678	20,426	**20,426**
June		21,883	17,021	17,021	19,452	**19,452**
July		19,958	14,593	14,593	17,276	**17,276**
August		22,815	14,573	14,573	18,694	**18,694**
September		19,934	14,287	14,287	17,111	**17,111**
October		20,918	17,134	17,134	19,026	**19,026**
November	21,378	19,768		0	19,768	**19,768**
December	22,774	19,999		19,999	21,387	**21,387**
Annual				**196,953**	**235,164**	**235,164**

	Total Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	22,486	16,984	16,984	19,735	**19,735**
February	0	22,588	19,270	19,270	20,929	**20,929**
March	0	20,926	20,299	20,299	20,613	**20,613**
April	0	18,384	23,115	23,115	20,750	**20,750**
May	0	21,827	20,267	20,267	21,047	**21,047**
June	0	24,286	19,081	19,081	21,684	**21,684**
July	0	22,378	16,376	16,376	19,377	**19,377**
August	0	25,372	16,370	16,370	20,871	**20,871**
September	0	21,712	15,349	15,349	18,531	**18,531**
October	0	20,918	17,134	17,134	19,026	**19,026**
November	21,378	19,768	0	0	9,884	**9,884**
December	22,774	19,999	0	19,999	21,387	**21,387**
Annual				**204,244**	**233,832**	**233,832**

	Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$1,743	$1,425	$1,425	$1,584	**$ 1,584**
February		$1,765	$1,713	$1,713	$1,739	**$ 1,739**
March		$1,558	$1,706	$1,706	$1,632	**$ 1,632**
April		$1,383	$1,904	$1,904	$1,644	**$ 1,644**
May		$1,567	$1,602	$1,602	$1,584	**$ 1,584**
June		$1,868	$1,683	$1,683	$1,775	**$ 1,775**
July		$1,775	$1,397	$1,397	$1,586	**$ 1,586**
August		$1,898	$1,410	$1,410	$1,654	**$ 1,654**
September		$1,662	$1,283	$1,283	$1,473	**$ 1,473**
October		$1,611	$1,443	$1,443	$1,527	**$ 1,527**
November	$1,823	$1,497		$0	$1,497	**$ 1,497**
December	$1,727	$1,615		$1,615	$1,671	**$ 1,671**
Annual				**$17,180**	**$19,365**	**$ 19,365**

Site Name: Carver Ranches Library
Service Address: 4800 PEMBROKE RD, HOLLYW OOD FL, 33021
Square Feet: 16,700

Electric History

Account: 1421554864
Meter: KU31569
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	77	92	85	85	89	**89**
February	75	77	81	81	79	**79**
March	88	83	82	82	83	**83**
April	86	82	85	85	84	**84**
May	99	95	90	90	93	**93**
June	97	101	90	90	96	**96**
July	103	103	94	94	99	**99**
August	101	100	98	98	99	**99**
September	102	101	95	95	98	**98**
October	98	95	95	95	95	**95**
November	97	95	94	94	95	**95**
December	94	94		94	94	**94**
Annual				**1,083**	**1,101**	**1,101**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	20,400	23,040	22,740	22,740	22,890	**22,890**
February	18,180	16,500	19,260	19,260	17,880	**17,880**
March	17,760	20,880	21,300	21,300	21,090	**21,090**
April	22,800	22,440	22,320	22,320	22,380	**22,380**
May	24,540	23,520	24,360	24,360	23,940	**23,940**
June	25,620	28,560	27,660	27,660	28,110	**28,110**
July	28,980	31,020	29,340	29,340	30,180	**30,180**
August	27,900	31,440	31,020	31,020	31,230	**31,230**
September	28,560	29,520	25,860	25,860	27,690	**27,690**
October	25,740	25,020	24,900	24,900	24,960	**24,960**
November	24,660	25,320	23,880	23,880	24,600	**24,600**
December	22,200	24,780		24,780	23,490	**23,490**
Annual				**297,420**	**298,440**	**298,440**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$2,129	$2,300	$2,278	$2,278	$2,289	**$ 2,289**
February	$1,973	$1,775	$2,037	$2,037	$1,906	**$ 1,906**
March	$2,105	$2,087	$2,217	$2,217	$2,152	**$ 2,152**
April	$2,385	$2,110	$2,311	$2,311	$2,210	**$ 2,210**
May	$2,563	$2,313	$2,488	$2,488	$2,400	**$ 2,400**
June	$2,603	$2,643	$2,682	$2,682	$2,662	**$ 2,662**
July	$2,864	$2,793	$2,826	$2,826	$2,810	**$ 2,810**
August	$2,780	$2,781	$2,971	$2,971	$2,876	**$ 2,876**
September	$2,819	$2,687	$2,634	$2,634	$2,660	**$ 2,660**
October	$2,613	$2,387	$2,578	$2,578	$2,482	**$ 2,482**
November	$2,541	$2,403	$2,506	$2,506	$2,455	**$ 2,455**
December	$2,367	$2,364		$2,364	$2,365	**$ 2,365**
Annual				**$29,890**	**$29,268**	**$ 29,268**

Site Name: Pompano Branch Library
Service Address: 1580 NW 3RD AVE, POMPANO BEACH FL, 33060
Square Feet: 10,000

Electric History

Account: 4376940377
Meter: KV33766
Rate: GSD-1
Baseline: Average of Last Two Years

	Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	52	62	61	61	62	**62**
February	43	58	52	52	55	**55**
March	43	57	55	55	56	**56**
April	58	56	56	56	56	**56**
May	59	53	38	38	46	**46**
June	58	58	52	52	55	**55**
July	74	69	60	60	65	**65**
August	71	68	59	59	64	**64**
September	71	69	57	57	63	**63**
October	59	52	59	59	56	**56**
November	59	55	41	41	48	**48**
December	62	57		57	60	**60**
Annual				**647**	**683**	**683**

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	12,060	19,500	19,620	19,620	19,560	**19,560**
February	11,880	15,060	16,920	16,920	15,990	**15,990**
March	11,280	16,440	16,800	16,800	16,620	**16,620**
April	13,200	17,700	18,780	18,780	18,240	**18,240**
May	15,780	16,080	16,680	16,680	16,380	**16,380**
June	19,860	18,120	17,220	17,220	17,670	**17,670**
July	22,140	23,400	19,920	19,920	21,660	**21,660**
August	24,660	21,240	17,520	17,520	19,380	**19,380**
September	18,300	23,160	18,300	18,300	20,730	**20,730**
October	18,420	16,980	14,880	14,880	15,930	**15,930**
November	17,520	17,580	15,000	15,000	16,290	**16,290**
December	17,760	17,880		17,880	17,820	**17,820**
Annual				**209,520**	**216,270**	**216,270**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	$1,344	$1,777	$1,828	$1,828	$1,802	**$ 1,802**
February	$1,229	$1,488	$1,572	$1,572	$1,530	**$ 1,530**
March	$1,198	$1,557	$1,642	$1,642	$1,599	**$ 1,599**
April	$1,486	$1,571	$1,769	$1,769	$1,670	**$ 1,670**
May	$1,604	$1,453	$1,439	$1,439	$1,446	**$ 1,446**
June	$1,827	$1,617	$1,633	$1,633	$1,625	**$ 1,625**
July	$2,141	$2,015	$1,883	$1,883	$1,949	**$ 1,949**
August	$2,251	$1,892	$1,731	$1,731	$1,811	**$ 1,811**
September	$1,881	$1,998	$1,753	$1,753	$1,875	**$ 1,875**
October	$1,749	$1,487	$1,576	$1,576	$1,531	**$ 1,531**
November	$1,698	$1,552	$1,376	$1,376	$1,464	**$ 1,464**
December	$1,746	$1,590		$1,590	$1,668	**$ 1,668**
Annual				**$19,791**	**$19,971**	**$ 19,971**

Site Name: Public Safety Complex - Public Safety Building
Service Address:
Square Feet: 253,076

Electric History

Account:
Meter:
Rate: CILC-1D
Baseline: Average of Last Two Years

Month	On-Peak Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		878	893	893	886	**886**
February		913	862	862	888	**888**
March		939	862	862	901	**901**
April		895	886	886	891	**891**
May		990	1,000	1,000	995	**995**
June		1,039	1,004	1,004	1,022	**1,022**
July		882	997	997	940	**940**
August		973	1,039	1,039	1,006	**1,006**
September		998	1,039	1,039	1,019	**1,019**
October	989	881	1,039	1,039	960	**960**
November	917	949	1,039	1,039	994	**994**
December	972	917		917	945	**945**
Annual				**11,577**	**11,443**	**11,443**

Month	On-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		116,001	121,055	121,055	118,528	**118,528**
February		121,086	111,621	111,621	116,354	**116,354**
March		133,290	123,780	123,780	128,535	**128,535**
April		139,849	135,275	135,275	137,562	**137,562**
May		147,875	154,022	154,022	150,949	**150,949**
June		151,666	154,274	154,274	152,970	**152,970**
July		149,646	140,534	140,534	145,090	**145,090**
August		167,319	161,517	161,517	164,418	**164,418**
September		148,145	152,681	152,681	150,413	**150,413**
October	151,867	145,047	159,621	159,621	152,334	**152,334**
November	129,389	119,390	121,481	121,481	120,436	**120,436**
December	136,999	133,266		133,266	135,133	**135,133**
Annual				**1,669,127**	**1,672,720**	**1,672,720**

Month	Off-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		373,959	385,465	385,465	379,712	**379,712**
February		366,954	346,059	346,059	356,507	**356,507**
March		427,590	397,740	397,740	412,665	**412,665**
April		355,511	346,045	346,045	350,778	**350,778**
May		358,525	361,978	361,978	360,252	**360,252**
June		381,374	406,126	406,126	393,750	**393,750**
July		412,074	363,946	363,946	388,010	**388,010**
August		390,681	383,763	383,763	387,222	**387,222**
September		407,935	423,799	423,799	415,867	**415,867**
October	400,373	353,553	378,339	378,339	365,946	**365,946**
November	381,931	354,490	405,799	405,799	380,145	**380,145**
December	466,241	464,334		464,334	465,288	**465,288**
Annual				**4,663,393**	**4,656,140**	**4,656,140**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	489,960	506,520	506,520	498,240	**498,240**
February	0	488,040	457,680	457,680	472,860	**472,860**
March	0	560,880	521,520	521,520	541,200	**541,200**
April	0	495,360	481,320	481,320	488,340	**488,340**
May	0	506,400	516,000	516,000	511,200	**511,200**
June	0	533,040	560,400	560,400	546,720	**546,720**
July	0	561,720	504,480	504,480	533,100	**533,100**
August	0	558,000	545,280	545,280	551,640	**551,640**
September	0	556,080	576,480	576,480	566,280	**566,280**
October	552,240	498,600	537,960	537,960	518,280	**518,280**
November	511,320	473,880	527,280	527,280	500,580	**500,580**
December	603,240	597,600	0	597,600	600,420	**600,420**
Annual				**6,332,520**	**6,328,860**	**6,328,860**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$28,057	$30,521	$30,521	$29,289	**$ 29,289**
February		$28,347	$28,130	$28,130	$28,238	**$ 28,238**
March		$31,110	$31,873	$31,873	$31,492	**$ 31,492**
April		$27,225	$30,528	$30,528	$28,877	**$ 28,877**
May		$28,225	$32,448	$32,448	$30,337	**$ 30,337**
June		$28,922	$34,570	$34,570	$31,746	**$ 31,746**
July		$29,708	$31,629	$31,629	$30,668	**$ 30,668**
August		$29,952	$33,562	$33,562	$31,757	**$ 31,757**
September		$30,022	$35,047	$35,047	$32,535	**$ 32,535**
October	$33,014	$27,416	$33,395	$33,395	$30,406	**$ 30,406**
November	$30,553	$26,610	$32,248	$32,248	$29,429	**$ 29,429**
December	$34,112	$30,869		$30,869	$32,491	**$ 32,491**
Annual				**$384,822**	**$367,264**	**$ 367,264**

Site Name: Public Safety Complex - BSO District 5 Office
Service Address:
Square Feet: 20,250

Electric History

Account:
Meter:
Rate: GSDT-1
Baseline: Average of Last Two Years

Month	On-Peak Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		90	88	88	89	**89**
February		91	100	100	96	**96**
March		97	102	102	100	**100**
April		97	98	98	98	**98**
May		99	109	109	104	**104**
June		103	111	111	107	**107**
July		111	115	115	113	**113**
August		112	120	120	116	**116**
September		108	115	115	112	**112**
October	110	102	107	107	105	**105**
November	105	98	88	88	93	**93**
December	98	98		98	98	**98**
Annual				**1,251**	**1,229**	**1,229**

Month	On-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		8,838	10,168	10,168	9,503	**9,503**
February		9,692	9,536	9,536	9,614	**9,614**
March		11,567	10,550	10,550	11,059	**11,059**
April		13,551	14,512	14,512	14,032	**14,032**
May		15,372	18,599	18,599	16,986	**16,986**
June		16,545	18,903	18,903	17,724	**17,724**
July		17,935	17,977	17,977	17,956	**17,956**
August		19,873	20,055	20,055	19,964	**19,964**
September		17,049	15,781	15,781	16,415	**16,415**
October	17,333	15,814	17,600	17,600	16,707	**16,707**
November	13,895	11,037	11,915	11,915	11,476	**11,476**
December	13,364	12,034		12,034	12,699	**12,699**
Annual				**177,630**	**174,134**	**174,134**

Month	Off-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		30,822	35,012	35,012	32,917	**32,917**
February		30,028	31,384	31,384	30,706	**30,706**
March		38,773	36,370	36,370	37,572	**37,572**
April		33,009	36,248	36,248	34,629	**34,629**
May		36,288	42,001	42,001	39,145	**39,145**
June		42,135	50,817	50,817	46,476	**46,476**
July		49,265	47,123	47,123	48,194	**48,194**
August		45,947	47,625	47,625	46,786	**46,786**
September		46,671	43,139	43,139	44,905	**44,905**
October	43,567	37,106	42,400	42,400	39,753	**39,753**
November	40,885	34,083	40,525	40,525	37,304	**37,304**
December	47,476	44,006		44,006	45,741	**45,741**
Annual				**496,650**	**484,127**	**484,127**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	39,660	45,180	45,180	42,420	**42,420**
February	0	39,720	40,920	40,920	40,320	**40,320**
March	0	50,340	46,920	46,920	48,630	**48,630**
April	0	46,560	50,760	50,760	48,660	**48,660**
May	0	51,660	60,600	60,600	56,130	**56,130**
June	0	58,680	69,720	69,720	64,200	**64,200**
July	0	67,200	65,100	65,100	66,150	**66,150**
August	0	65,820	67,680	67,680	66,750	**66,750**
September	0	63,720	58,920	58,920	61,320	**61,320**
October	60,900	52,920	60,000	60,000	56,460	**56,460**
November	54,780	45,120	52,440	52,440	48,780	**48,780**
December	60,840	56,040	0	56,040	58,440	**58,440**
Annual				**674,280**	**658,260**	**658,260**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$2,962	$3,337	$3,337	$3,150	**$ 3,150**
February		$2,995	$3,139	$3,139	$3,067	**$ 3,067**
March		$3,595	$3,563	$3,563	$3,579	**$ 3,579**
April		$3,465	$4,002	$4,002	$3,734	**$ 3,734**
May		$3,761	$4,731	$4,731	$4,246	**$ 4,246**
June		$4,127	$5,184	$5,184	$4,656	**$ 4,656**
July		$4,600	$4,983	$4,983	$4,791	**$ 4,791**
August		$4,645	$5,237	$5,237	$4,941	**$ 4,941**
September		$4,384	$4,616	$4,616	$4,500	**$ 4,500**
October	$4,617	$3,856	$4,645	$4,645	$4,250	**$ 4,250**
November	$4,088	$3,272	$3,868	$3,868	$3,570	**$ 3,570**
December	$4,195	$3,639		$3,639	$3,917	**$ 3,917**
Annual				**$50,943**	**$48,401**	**$ 48,401**

Site Name: Public Safety Complex - BSO Inventory and Evidence Warehouse
Service Address:
Square Feet: 20,704

Electric History

Account:
Meter:
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		47	52	52	50	**50**
February		58	49	49	54	**54**
March		63	61	61	62	**62**
April		62	62	62	62	**62**
May		70	62	62	66	**66**
June		72	67	67	70	**70**
July		73	68	68	71	**71**
August		70	73	73	72	**72**
September		69	71	71	70	**70**
October	64	67	65	65	66	**66**
November	67	56	54	54	55	**55**
December	62	66		66	64	**64**
Annual				**750**	**760**	**760**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		16,740	15,900	15,900	16,320	**16,320**
February		16,920	15,420	15,420	16,170	**16,170**
March		24,120	19,320	19,320	21,720	**21,720**
April		22,560	19,260	19,260	20,910	**20,910**
May		24,660	23,280	23,280	23,970	**23,970**
June		29,340	28,380	28,380	28,860	**28,860**
July		34,920	25,740	25,740	30,330	**30,330**
August		33,120	28,320	28,320	30,720	**30,720**
September		32,760	23,580	23,580	28,170	**28,170**
October	25,920	24,840	27,000	27,000	25,920	**25,920**
November	22,920	18,240	19,860	19,860	19,050	**19,050**
December	24,900	21,060		21,060	22,980	**22,980**
Annual				**267,120**	**285,120**	**285,120**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$1,431	$1,486	$1,486	$1,458	**$ 1,458**
February		$1,559	$1,425	$1,425	$1,492	**$ 1,492**
March		$2,007	$1,821	$1,821	$1,914	**$ 1,914**
April		$1,853	$1,829	$1,829	$1,841	**$ 1,841**
May		$2,048	$2,059	$2,059	$2,054	**$ 2,054**
June		$2,309	$2,409	$2,409	$2,359	**$ 2,359**
July		$2,603	$2,269	$2,269	$2,436	**$ 2,436**
August		$2,479	$2,473	$2,473	$2,476	**$ 2,476**
September		$2,444	$2,179	$2,179	$2,311	**$ 2,311**
October	$2,191	$2,021	$2,307	$2,307	$2,164	**$ 2,164**
November	$2,056	$1,565	$1,774	$1,774	$1,670	**$ 1,670**
December	$2,110	$1,819		$1,819	$1,964	**$ 1,964**
Annual				**$23,851**	**$24,139**	**$ 24,139**

Site Name: Public Safety Complex - Logistics Warehouse
Service Address:
Square Feet: 6,690

Electric History

Account:
Meter:
Rate: SDTR-1A
Baseline: Average of Last Two Years

High Demand (kW)						
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January				0	#DIV/0!	**#DIV/0!**
February				0	#DIV/0!	**#DIV/0!**
March				0	#DIV/0!	**#DIV/0!**
April				0	#DIV/0!	**#DIV/0!**
May				0	#DIV/0!	**#DIV/0!**
June				0	#DIV/0!	**#DIV/0!**
July				0	#DIV/0!	**#DIV/0!**
August				0	#DIV/0!	**#DIV/0!**
September				0	#DIV/0!	**#DIV/0!**
October				0	#DIV/0!	**#DIV/0!**
November				0	#DIV/0!	**#DIV/0!**
December				0	#DIV/0!	**#DIV/0!**
Annual				**0**	**#DIV/0!**	**#DIV/0!**

On-Peak Demand (kW)						
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		14	16	16	15	**15**
February		13	16	16	15	**15**
March		19	15	15	17	**17**
April		20	14	14	17	**17**
May		20	14	14	17	**17**
June		22	13	13	18	**18**
July		22	16	16	19	**19**
August		23	22	22	23	**23**
September		21	22	22	22	**22**
October	22	16	22	22	19	**19**
November	18	15	17	17	16	**16**
December	20	16		16	18	**18**
Annual				**203**	**214**	**214**

On-Peak Consumption (kWh)						
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		840	660	660	750	**750**
July		1,140	840	840	990	**990**
August		1,140	1,260	1,260	1,200	**1,200**
September		900	1,320	1,320	1,110	**1,110**
October	180	120	240	240	180	**180**
November	0	0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**4,320**	**4,230**	**4,230**

Off-Peak Consumption (kWh)						
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		6,360	8,640	8,640	7,500	**7,500**
February		5,460	7,620	7,620	6,540	**6,540**
March		8,100	8,520	8,520	8,310	**8,310**
April		9,060	7,680	7,680	8,370	**8,370**
May		9,720	8,220	8,220	8,970	**8,970**
June		10,080	8,520	8,520	9,300	**9,300**
July		11,160	9,300	9,300	10,230	**10,230**
August		9,720	12,180	12,180	10,950	**10,950**
September		9,480	14,400	14,400	11,940	**11,940**
October	9,900	8,400	12,780	12,780	10,590	**10,590**
November	9,180	7,680	8,100	8,100	7,890	**7,890**
December	10,200	9,840		9,840	10,020	**10,020**
Annual				**115,800**	**110,610**	**110,610**

Total Consumption (kWh)						
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	6,360	8,640	8,640	7,500	**7,500**
February	0	5,460	7,620	7,620	6,540	**6,540**
March	0	8,100	8,520	8,520	8,310	**8,310**
April	0	9,060	7,680	7,680	8,370	**8,370**
May	0	9,720	8,220	8,220	8,970	**8,970**
June	0	10,920	9,180	9,180	10,050	**10,050**
July	0	12,300	10,140	10,140	11,220	**11,220**
August	0	10,860	13,440	13,440	12,150	**12,150**
September	0	10,380	15,720	15,720	13,050	**13,050**
October	10,080	8,520	13,020	13,020	10,770	**10,770**
November	9,180	7,680	8,100	8,100	7,890	**7,890**
December	10,200	9,840	0	9,840	10,020	**10,020**
Annual				**120,120**	**114,840**	**114,840**

Dollars						
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$517	$676	$676	$596	**$ 596**
February		$458	$620	$620	$539	**$ 539**
March		$665	$679	$679	$672	**$ 672**
April		$702	$620	$620	$661	**$ 661**
May		$736	$651	$651	$693	**$ 693**
June		$835	$696	$696	$766	**$ 766**
July		$919	$796	$796	$858	**$ 858**
August		$859	$1,068	$1,068	$964	**$ 964**
September		$803	$1,186	$1,186	$995	**$ 995**
October	$831	$631	$1,014	$1,014	$822	**$ 822**
November	$737	$578	$677	$677	$628	**$ 628**
December	$815	$698		$698	$757	**$ 757**
Annual				**$9,381**	**$8,950**	**$ 8,950**

Site Name: North Regional Courthouse
Service Address: 1600 W HILLSBORO BLVD
Square Feet: 200,000

Electric History

Account: 6588856242
Meter: RV850V0
Rate: GSLD-1
Baseline: Average of Last Two Years

	Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		392	386	386	389	**389**
February		494	401	401	448	**448**
March		382	400	400	391	**391**
April		387	399	399	393	**393**
May		396	402	402	399	**399**
June		414	407	407	411	**411**
July	420	415	518	518	467	**467**
August	416	422	437	437	430	**430**
September	463	466	426	426	446	**446**
October	460	409	420	420	415	**415**
November	411	414	404	404	409	**409**
December	428	392		392	410	**410**
Annual				**4,992**	**5,006**	**5,006**

	Total Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		216,400	196,800	196,800	206,600	**206,600**
February		182,000	184,400	184,400	183,200	**183,200**
March		191,600	181,600	181,600	186,600	**186,600**
April		209,200	197,200	197,200	203,200	**203,200**
May		191,600	200,400	200,400	196,000	**196,000**
June		208,800	222,000	222,000	215,400	**215,400**
July	225,600	225,200	217,600	217,600	221,400	**221,400**
August	211,200	216,400	216,000	216,000	216,200	**216,200**
September	218,400	235,200	222,400	222,400	228,800	**228,800**
October	228,000	199,200	203,600	203,600	201,400	**201,400**
November	203,200	189,200	200,000	200,000	194,600	**194,600**
December	200,800	188,800		188,800	194,800	**194,800**
Annual				**2,430,800**	**2,448,200**	**2,448,200**

	Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$16,248	$15,484	$15,484	$15,866	**$ 15,866**
February		$15,475	$14,963	$14,963	$15,219	**$ 15,219**
March		$14,814	$15,249	$15,249	$15,031	**$ 15,031**
April		$15,216	$16,141	$16,141	$15,679	**$ 15,679**
May		$14,409	$16,363	$16,363	$15,386	**$ 15,386**
June		$15,517	$17,692	$17,692	$16,604	**$ 16,604**
July	$17,772	$16,377	$18,828	$18,828	$17,603	**$ 17,603**
August	$16,902	$16,001	$17,636	$17,636	$16,819	**$ 16,819**
September	$17,782	$17,429	17827l24	17827l24	$17,429	**$ 17,429**
October	$18,294	$14,927	$16,737	$16,737	$15,832	**$ 15,832**
November	$16,318	$14,468	$16,325	$16,325	$15,397	**$ 15,397**
December	$16,378	$14,198		$14,198	$15,288	**$ 15,288**
Annual				**$179,615**	**$192,152**	**$ 192,152**

Site Name: Government Center West
Service Address: 1 N UNIVERSITY DR PLANTATION FL
Square Feet: 184,820

Electric History

Account: 2516236441
Meter: RV755V0
Rate: GSLDT-1
Baseline: Average of Last Two Years

	On-Peak Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		551	558	558	555	**555**
February		594	547	547	571	**571**
March		539	578	578	559	**559**
April		558	607	607	583	**583**
May		575	574	574	575	**575**
June		584	582	582	583	**583**
July		673	575	575	624	**624**
August		638	590	590	614	**614**
September		683	614	614	649	**649**
October	627	589	619	619	604	**604**
November	563	563	591	591	577	**577**
December	556	542		542	549	**549**
Annual				**6,977**	**7,040**	**7,040**

	On-Peak Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		74,764	63,923	63,923	69,344	**69,344**
February		62,675	61,577	61,577	62,126	**62,126**
March		67,583	60,922	60,922	64,253	**64,253**
April		83,467	77,614	77,614	80,541	**80,541**
May		90,246	91,455	91,455	90,851	**90,851**
June		93,159	96,969	96,969	95,064	**95,064**
July		98,714	93,956	93,956	96,335	**96,335**
August		99,621	94,180	94,180	96,901	**96,901**
September		95,871	88,861	88,861	92,366	**92,366**
October	93,830	88,997	94,625	94,625	91,811	**91,811**
November	76,983	72,234	80,847	80,847	76,541	**76,541**
December	67,571	64,272		64,272	65,922	**65,922**
Annual				**969,201**	**982,052**	**982,052**

	Off-Peak Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		244,916	196,957	196,957	220,937	**220,937**
February		185,005	179,623	179,623	182,314	**182,314**
March		207,217	195,398	195,398	201,308	**201,308**
April		193,493	185,426	185,426	189,460	**189,460**
May		186,234	182,625	182,625	184,430	**184,430**
June		218,601	199,431	199,431	209,016	**209,016**
July		210,406	197,404	197,404	203,905	**203,905**
August		220,779	206,780	206,780	213,780	**213,780**
September		203,889	194,579	194,579	199,234	**199,234**
October	185,290	189,163	207,535	207,535	198,349	**198,349**
November	190,857	188,406	211,953	211,953	200,180	**200,180**
December	200,989	208,368		208,368	204,679	**204,679**
Annual				**2,366,079**	**2,407,589**	**2,407,589**

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January	0	319,680	260,880	260,880	290,280	**290,280**
February	0	247,680	241,200	241,200	244,440	**244,440**
March	0	274,800	256,320	256,320	265,560	**265,560**
April	0	276,960	263,040	263,040	270,000	**270,000**
May	0	276,480	274,080	274,080	275,280	**275,280**
June	0	311,760	296,400	296,400	304,080	**304,080**
July	0	309,120	291,360	291,360	300,240	**300,240**
August	0	320,400	300,960	300,960	310,680	**310,680**
September	0	299,760	283,440	283,440	291,600	**291,600**
October	279,120	278,160	302,160	302,160	290,160	**290,160**
November	267,840	260,640	292,800	292,800	276,720	**276,720**
December	268,560	272,640	0	272,640	270,600	**270,600**
Annual				**3,335,280**	**3,389,640**	**3,389,640**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		$18,632	$17,369	$17,369	$18,001	**$ 18,001**
February		$16,173	$16,268	$16,268	$16,221	**$ 16,221**
March		$16,875	$18,205	$18,205	$17,540	**$ 17,540**
April		$16,171	$18,836	$18,836	$17,504	**$ 17,504**
May		$16,215	$18,601	$18,601	$17,408	**$ 17,408**
June		$17,606	$19,662	$19,662	$18,634	**$ 18,634**
July		$18,718	$19,237	$19,237	$18,977	**$ 18,977**
August		$18,721	$19,908	$19,908	$19,314	**$ 19,314**
September		$18,289	$19,612	$19,612	$18,950	**$ 18,950**
October	$18,447	$16,489	$20,376	$20,376	$18,433	**$ 18,433**
November	$17,285	$15,420	$19,680	$19,680	$17,550	**$ 17,550**
December	$17,257	$15,760		$15,760	$16,509	**$ 16,509**
Annual				**$223,514**	**$215,041**	**$ 215,041**

Site Name: Traffic Engineering Admin North
(Continued)

Account: 7389896072
Meter: MV54711
Rate: GSDT-1
Baseline: Average of Last Two Years

Month	On-Peak Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		235	217	217	226	**226**
February		217	212	212	215	**215**
March		223	218	218	221	**221**
April		244	238	238	241	**241**
May		257	263	263	260	**260**
June		288	250	250	269	**269**
July		282	259	259	271	**271**
August		318	260	260	289	**289**
September		254	259	259	257	**257**
October		257	239	239	248	**248**
November		233	220	220	227	**227**
December	248	260		260	254	**254**
Annual				**2,895**	**2,976**	**2,976**

Month	Total On-Peak Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		308	299	299	304	**304**
February		303	301	301	302	**302**
March		314	289	289	302	**302**
April		336	351	351	344	**344**
May		351	370	370	361	**361**
June		401	356	356	379	**379**
July		396	369	369	383	**383**
August		427	351	351	389	**389**
September		355	342	342	349	**349**
October		366	312	312	339	**339**
November		321	297	297	309	**309**
December	339	351		351	345	**345**
Annual				**3,988**	**4,103**	**4,103**

Month	On-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		31,560	30,840	30,840	31,200	**31,200**
February		33,000	28,920	28,920	30,960	**30,960**
March		37,200	33,960	33,960	35,580	**35,580**
April		39,480	35,640	35,640	37,560	**37,560**
May		41,520	41,760	41,760	41,640	**41,640**
June		45,840	42,240	42,240	44,040	**44,040**
July		47,880	39,240	39,240	43,560	**43,560**
August		50,280	45,720	45,720	48,000	**48,000**
September		41,400	38,400	38,400	39,900	**39,900**
October		40,560	41,160	41,160	40,860	**40,860**
November		33,480	33,120	33,120	33,300	**33,300**
December	38,880	33,480		33,480	36,180	**36,180**
Annual				**444,480**	**462,780**	**462,780**

Month	Off-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		106,200	106,200	106,200	106,200	**106,200**
February		111,720	111,720	111,720	111,720	**111,720**
March		111,960	111,960	111,960	111,960	**111,960**
April		100,440	100,440	100,440	100,440	**100,440**
May		116,400	116,400	116,400	116,400	**116,400**
June		113,400	113,400	113,400	113,400	**113,400**
July		123,720	123,720	123,720	123,720	**123,720**
August		128,880	128,880	128,880	128,880	**128,880**
September		106,800	106,800	106,800	106,800	**106,800**
October		110,520	110,520	110,520	110,520	**110,520**
November		107,640	107,640	107,640	107,640	**107,640**
December	124,080	108,120		108,120	116,100	**116,100**
Annual				**1,345,800**	**1,353,780**	**1,353,780**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		172,980	177,540	177,540	175,260	**175,260**
February		182,220	178,200	178,200	180,210	**180,210**
March		194,820	172,860	172,860	183,840	**183,840**
April		184,620	165,780	165,780	175,200	**175,200**
May		211,740	218,160	218,160	214,950	**214,950**
June		218,040	210,120	210,120	214,080	**214,080**
July		236,100	217,680	217,680	226,890	**226,890**
August		246,600	217,320	217,320	231,960	**231,960**
September		205,080	178,440	178,440	191,760	**191,760**
October		204,360	183,540	183,540	193,950	**193,950**
November		184,260	171,840	171,840	178,050	**178,050**
December	211,140	185,880		185,880	198,510	**198,510**
Annual				**2,277,360**	**2,364,660**	**2,364,660**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$9,899	$10,010	$10,010	$9,954	**$ 9,954**
February		$9,925	$9,122	$9,122	$9,524	**$ 9,524**
March		$10,365	$10,213	$10,213	$10,289	**$ 10,289**
April		$9,888	$10,108	$10,108	$9,998	**$ 9,998**
May		$10,819	$11,829	$11,829	$11,324	**$ 11,324**
June		$11,516	$11,222	$11,222	$11,369	**$ 11,369**
July		$11,859	$11,566	$11,566	$11,712	**$ 11,712**
August		$12,843	$11,897	$11,897	$12,370	**$ 12,370**
September		$10,380	$11,021	$11,021	$10,700	**$ 10,700**
October		$10,521	$11,339	$11,339	$10,930	**$ 10,930**
November		$9,653	$10,364	$10,364	$10,008	**$ 10,008**
December	$11,645	$10,079		$10,079	$10,862	**$ 10,862**
Annual				**$128,769**	**$129,041**	**$ 129,041**

Month	Total Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$12,645	$13,223	$13,223	$12,934	**$ 12,934**
February		$12,935	$12,250	$12,250	$12,592	**$ 12,592**
March		$13,887	$12,612	$12,612	$13,249	**$ 13,249**
April		$13,237	$13,140	$13,140	$13,189	**$ 13,189**
May		$14,661	$16,566	$16,566	$15,613	**$ 15,613**
June		$15,996	$15,791	$15,791	$15,893	**$ 15,893**
July		$16,649	$16,181	$16,181	$16,415	**$ 16,415**
August		$17,717	$15,609	$15,609	$16,663	**$ 16,663**
September		$14,609	$14,075	$14,075	$14,342	**$ 14,342**
October		$14,494	$14,049	$14,049	$14,272	**$ 14,272**
November		$12,874	$13,073	$13,073	$12,973	**$ 12,973**
December	$15,432	$13,392		$13,392	$14,412	**$ 14,412**
Annual				**$169,961**	**$172,549**	**$ 172,549**

Site Name: Park Administration Complex
Service Address:
Square Feet: 35,296
Site: Park Administrative Complex

Electric History

Account: 1176649273
Meter: KU33665
Rate: GSD-1
Baseline: Average of Last Two Years

	Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		25	25	25	25	**25**
February		19	23	23	21	**21**
March		23	20	20	22	**22**
April		20	25	25	23	**23**
May		21	22	22	22	**22**
June		22	22	22	22	**22**
July		28	28	28	28	**28**
August	28	28	28	28	28	**28**
September	28	22	31	31	27	**27**
October	20	26	22	22	24	**24**
November	21	26	19	19	23	**23**
December	18	27		27	23	**23**
Annual				**292**	**285**	**285**

	Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		3,420	13,200	13,200	8,310	**8,310**
February		3,240	11,820	11,820	7,530	**7,530**
March		3,540	12,960	12,960	8,250	**8,250**
April		3,480	10,320	10,320	6,900	**6,900**
May		4,800	14,640	14,640	9,720	**9,720**
June		6,360	13,740	13,740	10,050	**10,050**
July		9,420	13,140	13,140	11,280	**11,280**
August	6,360	13,800	14,160	14,160	13,980	**13,980**
September	5,460	12,660	12,780	12,780	12,720	**12,720**
October	5,460	13,980	13,920	13,920	13,950	**13,950**
November	4,500	13,020	11,940	11,940	12,480	**12,480**
December	3,840	12,900		12,900	8,370	**8,370**
Annual				**155,520**	**123,540**	**123,540**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		$484	$1,054	$1,054	$769	**$ 769**
February		$408	$953	$953	$681	**$ 681**
March		$470	$1,015	$1,015	$742	**$ 742**
April		$428	$918	$918	$673	**$ 673**
May		$508	$1,136	$1,136	$822	**$ 822**
June		$600	$1,084	$1,084	$842	**$ 842**
July		$827	$1,118	$1,118	$972	**$ 972**
August	$708	$1,053	$1,178	$1,178	$1,116	**$ 1,116**
September	$655	$924	$1,132	$1,132	$1,028	**$ 1,028**
October	$562	$1,037	$1,094	$1,094	$1,066	**$ 1,066**
November	$519	$988	$944	$944	$966	**$ 966**
December	$447	$993		$993	$720	**$ 720**
Annual				**$12,620**	**$10,398**	**$ 10,398**

Account: 1172640276
Meter: KU33593
Rate: GSD-1
Baseline: Average of Last Two Years

	Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		24	22	22	23	**23**
February		25	23	23	24	**24**
March		26	26	26	26	**26**
April		26	29	29	28	**28**
May		26	29	29	28	**28**
June		30	29	29	30	**30**
July		31	31	31	31	**31**
August	31	30	31	31	31	**31**
September	32	28	29	29	29	**29**
October	26	28	30	30	29	**29**
November	26	24	28	28	26	**26**
December	28	26		26	27	**27**
Annual				**333**	**330**	**330**

	Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		6,720	6,900	6,900	6,810	**6,810**
February		7,020	6,600	6,600	6,810	**6,810**
March		8,400	7,860	7,860	8,130	**8,130**
April		8,160	7,440	7,440	7,800	**7,800**
May		9,300	9,960	9,960	9,630	**9,630**
June		10,320	9,000	9,000	9,660	**9,660**
July		10,740	10,140	10,140	10,440	**10,440**
August	11,100	11,340	10,980	10,980	11,160	**11,160**
September	9,900	9,360	8,400	8,400	8,880	**8,880**
October	8,580	9,660	9,960	9,960	9,810	**9,810**
November	8,640	8,100	7,980	7,980	8,040	**8,040**
December	8,280	8,040		8,040	8,160	**8,160**
Annual				**103,260**	**105,330**	**105,330**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		$655	$667	$667	$661	**$ 661**
February		$683	$661	$661	$672	**$ 672**
March		$771	$786	$786	$779	**$ 779**
April		$738	$796	$796	$767	**$ 767**
May		$797	$943	$943	$870	**$ 870**
June		$896	$888	$888	$892	**$ 892**
July		$929	$977	$977	$953	**$ 953**
August	$1,014	$949	$1,027	$1,027	$988	**$ 988**
September	$953	$822	$852	$852	$837	**$ 837**
October	$809	$837	$955	$955	$896	**$ 896**
November	$812	$712	$816	$816	$764	**$ 764**
December	$815	$731		$731	$773	**$ 773**
Annual				**$10,100**	**$9,852**	**$ 9,852**

Site Name: Park Administration Complex
(Continued)

Account: 1178643225
Meter: KU53643
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		20	22	22	21	**21**
February		22	24	24	23	**23**
March		24	24	24	24	**24**
April		24	25	25	25	**25**
May		25	26	26	26	**26**
June		26	26	26	26	**26**
July		26	28	28	27	**27**
August	26	28	28	28	28	**28**
September	26	26	29	29	28	**28**
October	25	26	28	28	27	**27**
November	25	24	24	24	24	**24**
December	24	24		24	24	**24**
Annual				**308**	**302**	**302**

Month	Total Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		69	69	69	69	**69**
February		66	70	70	68	**68**
March		73	70	70	72	**72**
April		70	79	79	75	**75**
May		72	77	77	75	**75**
June		78	77	77	78	**78**
July		85	87	87	86	**86**
August	85	86	87	87	87	**87**
September	86	76	89	89	83	**83**
October	71	80	80	80	80	**80**
November	72	74	71	71	73	**73**
December	70	77		77	74	**74**
Annual				**933**	**916**	**916**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		5,040	6,120	6,120	5,580	**5,580**
February		5,160	6,600	6,600	5,880	**5,880**
March		6,720	8,040	8,040	7,380	**7,380**
April		7,320	8,400	8,400	7,860	**7,860**
May		8,280	10,680	10,680	9,480	**9,480**
June		8,160	9,240	9,240	8,700	**8,700**
July		9,480	9,960	9,960	9,720	**9,720**
August	9,600	10,080	10,320	10,320	10,200	**10,200**
September	8,400	8,880	8,040	8,040	8,460	**8,460**
October	7,680	9,720	9,120	9,120	9,420	**9,420**
November	7,440	7,200	6,840	6,840	7,020	**7,020**
December	6,840	7,080		7,080	6,960	**6,960**
Annual				**100,440**	**96,660**	**96,660**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		15,180	26,220	26,220	20,700	**20,700**
February		15,420	25,020	25,020	20,220	**20,220**
March		18,660	28,860	28,860	23,760	**23,760**
April		18,960	26,160	26,160	22,560	**22,560**
May		22,380	35,280	35,280	28,830	**28,830**
June		24,840	31,980	31,980	28,410	**28,410**
July		29,640	33,240	33,240	31,440	**31,440**
August	27,060	35,220	35,460	35,460	35,340	**35,340**
September	23,760	30,900	29,220	29,220	30,060	**30,060**
October	21,720	33,360	33,000	33,000	33,180	**33,180**
November	20,580	28,320	26,760	26,760	27,540	**27,540**
December	18,960	28,020		28,020	23,490	**23,490**
Annual				**359,220**	**325,530**	**325,530**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$519	$623	$623	$571	**$ 571**
February		$547	$673	$673	$610	**$ 610**
March		$657	$774	$774	$715	**$ 715**
April		$672	$806	$806	$739	**$ 739**
May		$733	$951	$951	$842	**$ 842**
June		$739	$867	$867	$803	**$ 803**
July		$807	$932	$932	$870	**$ 870**
August	$870	$861	$953	$953	$907	**$ 907**
September	$799	$774	$831	$831	$803	**$ 803**
October	$746	$818	$883	$883	$850	**$ 850**
November	$733	$665	$704	$704	$684	**$ 684**
December	$687	$659		$659	$673	**$ 673**
Annual				**$9,656**	**$9,067**	**$ 9,067**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$1,658	$2,343	$2,343	$2,001	**$ 2,001**
February		$1,638	$2,288	$2,288	$1,963	**$ 1,963**
March		$1,898	$2,575	$2,575	$2,236	**$ 2,236**
April		$1,839	$2,521	$2,521	$2,180	**$ 2,180**
May		$2,038	$3,031	$3,031	$2,534	**$ 2,534**
June		$2,235	$2,839	$2,839	$2,537	**$ 2,537**
July		$2,563	$3,028	$3,028	$2,795	**$ 2,795**
August	$2,592	$2,863	$3,158	$3,158	$3,010	**$ 3,010**
September	$2,407	$2,520	$2,815	$2,815	$2,668	**$ 2,668**
October	$2,118	$2,692	$2,933	$2,933	$2,813	**$ 2,813**
November	$2,064	$2,365	$2,464	$2,464	$2,414	**$ 2,414**
December	$1,949	$2,383		$2,383	$2,166	**$ 2,166**
Annual				**$32,377**	**$29,317**	**$ 29,317**

Site Name: Integ Waste South Landfill
Service Address: 7101 SW 205TH AVE SOUTHWEST RANCHES FL, 33332
Square Feet: 17,847

Electric History

Account: 8985734287
Meter: MNL8190
Rate: GSDT-1
Baseline: Average of Last Two Years

	Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		92	98	98	95	**95**
February		92	96	96	94	**94**
March		93	97	97	95	**95**
April		86	94	94	90	**90**
May		86	91	91	89	**89**
June		95	83	83	89	**89**
July		93	81	81	87	**87**
August		110	80	80	95	**95**
September		96	78	78	87	**87**
October		94	75	75	85	**85**
November		91	74	74	83	**83**
December	93	92		92	93	**93**
Annual				**1,039**	**1,080**	**1,080**

	On-Peak Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		12,631	15,232	15,232	13,932	**13,932**
February		11,155	13,630	13,630	12,393	**12,393**
March		13,015	14,082	14,082	13,549	**13,549**
April		13,618	14,739	14,739	14,179	**14,179**
May		14,208	14,979	14,979	14,594	**14,594**
June		14,008	14,140	14,140	14,074	**14,074**
July		15,489	13,112	13,112	14,301	**14,301**
August		15,781	12,871	12,871	14,326	**14,326**
September		15,049	12,803	12,803	13,926	**13,926**
October		14,917	12,339	12,339	13,628	**13,628**
November		13,875	11,726	11,726	12,801	**12,801**
December	11,762	13,381		13,381	12,572	**12,572**
Annual				**163,034**	**164,271**	**164,271**

	Off-Peak Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		42,950	54,339	54,339	48,645	**48,645**
February		35,865	43,834	43,834	39,850	**39,850**
March		36,502	44,255	44,255	40,379	**40,379**
April		38,452	47,466	47,466	42,959	**42,959**
May		32,843	42,291	42,291	37,567	**37,567**
June		38,551	44,318	44,318	41,435	**41,435**
July		47,572	37,502	37,502	42,537	**42,537**
August		42,477	34,418	34,418	38,448	**38,448**
September		47,187	38,698	38,698	42,943	**42,943**
October		41,193	33,155	33,155	37,174	**37,174**
November		39,780	33,822	33,822	36,801	**36,801**
December	35,479	43,734		43,734	39,607	**39,607**
Annual				**497,832**	**488,342**	**488,342**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		$3,922	$4,814	$4,814	$4,368	**$ 4,368**
February		$3,502	$4,194	$4,194	$3,848	**$ 3,848**
March		$3,717	$4,407	$4,407	$4,062	**$ 4,062**
April		$3,626	$4,578	$4,578	$4,102	**$ 4,102**
May		$3,460	$4,324	$4,324	$3,892	**$ 3,892**
June		$3,769	$4,256	$4,256	$4,012	**$ 4,012**
July		$4,218	$3,828	$3,828	$4,023	**$ 4,023**
August		$4,239	$3,652	$3,652	$3,946	**$ 3,946**
September		$4,189	$3,822	$3,822	$4,005	**$ 4,005**
October		$3,925	$3,489	$3,489	$3,707	**$ 3,707**
November		$3,750	$3,457	$3,457	$3,603	**$ 3,603**
December	$3,669	$3,871		$3,871	$3,770	**$ 3,770**
Annual				**$48,693**	**$47,339**	**$ 47,339**

Site Name: Integ Waste South Landfill
(Continued)

Account: 3279652519
Meter: KJ87663
Rate: GS-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January				0	0	0
February				0	0	0
March				0	0	0
April				0	0	0
May		NOT		0	0	0
June		APPLICABLE		0	0	0
July				0	0	0
August				0	0	0
September				0	0	0
October				0	0	0
November				0	0	0
December				0	0	0
Annual				**0**	**0**	**0**

Month	Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		353	254	254	304	**304**
February		673	201	201	437	**437**
March		382	215	215	299	**299**
April		205	192	192	199	**199**
May		194	222	222	208	**208**
June		437	769	769	603	**603**
July		200	501	501	351	**351**
August		215	394	394	305	**305**
September		653	649	649	651	**651**
October		484	689	689	587	**587**
November		347	568	568	458	**458**
December	629	301		301	465	**465**
Annual				**4,955**	**4,864**	**4,864**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$42	$35	$35	$39	**$ 39**
February		$73	$30	$30	$51	**$ 51**
March		$45	$32	$32	$38	**$ 38**
April		$28	$30	$30	$29	**$ 29**
May		$27	$33	$33	$30	**$ 30**
June		$50	$87	$87	$68	**$ 68**
July		$27	$60	$60	$44	**$ 44**
August		$29	$50	$50	$39	**$ 39**
September		$70	$75	$75	$73	**$ 73**
October		$54	$79	$79	$67	**$ 67**
November		$41	$67	$67	$54	**$ 54**
December	$71	$37		$37	$54	**$ 54**
Annual				**$615**	**$585**	**$ 585**

Site Name: Integ Waste South Landfill
(Continued)

Account: 3285657577
Meter: KJ87662
Rate: GS-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January				0	0	0
February				0	0	0
March				0	0	0
April	NOT APPLICABLE			0	0	0
May				0	0	0
June				0	0	0
July				0	0	0
August				0	0	0
September				0	0	0
October				0	0	0
November				0	0	0
December				0	0	0
Annual				**0**	**0**	**0**

Month	Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		424	155	155	290	**290**
February		363	107	107	235	**235**
March		52	177	177	115	**115**
April		158	105	105	132	**132**
May		241	134	134	188	**188**
June		222	459	459	341	**341**
July		125	425	425	275	**275**
August		131	384	384	258	**258**
September		692	562	562	627	**627**
October		697	543	543	620	**620**
November		227	499	499	363	**363**
December	713	112		112	413	**413**
Annual				**3,662**	**3,854**	**3,854**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$49	$26	$26	$37	**$ 37**
February		$43	$21	$21	$32	**$ 32**
March		$13	$28	$28	$21	**$ 21**
April		$23	$21	$21	$22	**$ 22**
May		$31	$24	$24	$28	**$ 28**
June		$29	$56	$56	$43	**$ 43**
July		$20	$53	$53	$37	**$ 37**
August		$21	$49	$49	$35	**$ 35**
September		$74	$66	$66	$70	**$ 70**
October		$74	$65	$65	$69	**$ 69**
November		$30	$60	$60	$45	**$ 45**
December	$79	$19		$19	$49	**$ 49**
Annual				**$488**	**$487**	**$ 487**

Site Name: Integ Waste South Landfill
(Continued)

Account: 3280650544
Meter: MJ5365A
Rate: SDTR-1A
Baseline: Average of Last Two Years

Month	High Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		22	19	19	21	**21**
February		27	21	21	24	**24**
March		21	19	19	20	**20**
April		21	18	18	20	**20**
May		22	19	19	21	**21**
June		6	0	0	3	**3**
July		11	11	11	11	**11**
August		9	4	4	7	**7**
September		17	18	18	18	**18**
October		14	13	13	14	**14**
November		14	15	15	15	**15**
December	0	17		17	9	**9**
Annual				**174**	**179**	**179**

Month	On-Peak Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		6	0	0	3	**3**
July		11	11	11	11	**11**
August		9	4	4	7	**7**
September		17	18	18	18	**18**
October		0	1	1	1	**1**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**34**	**39**	**39**

Month	On-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		6	0	0	3	**3**
July		6	8	8	7	**7**
August		9	10	10	10	**10**
September		10	42	42	26	**26**
October		0	0	0	0	**0**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**60**	**46**	**46**

Month	Off-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		70	120	120	95	**95**
February		128	153	153	141	**141**
March		329	173	173	251	**251**
April		260	190	190	225	**225**
May		150	191	191	171	**171**
June		66	80	80	73	**73**
July		106	84	84	95	**95**
August		82	74	74	78	**78**
September		24	129	129	77	**77**
October		91	128	128	110	**110**
November		209	90	90	150	**150**
December	0	118		118	59	**59**
Annual				**1,530**	**1,523**	**1,523**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$261	$242	$242	$251	**$ 251**
February		$316	$265	$265	$291	**$ 291**
March		$264	$245	$245	$255	**$ 255**
April		$267	$235	$235	$251	**$ 251**
May		$273	$246	$246	$259	**$ 259**
June		$107	$31	$31	$69	**$ 69**
July		$172	$167	$167	$169	**$ 169**
August		$146	$81	$81	$113	**$ 113**
September		$244	$259	$259	$252	**$ 252**
October		$184	$177	$177	$180	**$ 180**
November		$190	$196	$196	$193	**$ 193**
December	$28	$217		$217	$122	**$ 122**
Annual				**$2,360**	**$2,406**	**$ 2,406**

Site Name: Integ Waste South Landfill
(Continued)

Account: 9839231363
Meter: KJ87664
Rate: GS-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January				0	0	0
February				0	0	0
March				0	0	0
April				0	0	0
May		NOT		0	0	0
June		APPLICABLE		0	0	0
July				0	0	0
August				0	0	0
September				0	0	0
October				0	0	0
November				0	0	0
December				0	0	0
Annual				**0**	**0**	**0**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		1,929	1,537	1,537	1,733	**1,733**
February		2,303	733	733	1,518	**1,518**
March		2,661	373	373	1,517	**1,517**
April		2,292	111	111	1,202	**1,202**
May		1,498	1,338	1,338	1,418	**1,418**
June		2,427	2,288	2,288	2,358	**2,358**
July		712	1,788	1,788	1,250	**1,250**
August		2,488	2,141	2,141	2,315	**2,315**
September		1,740	2,151	2,151	1,946	**1,946**
October		1,807	1,261	1,261	1,534	**1,534**
November		1,427	1,263	1,263	1,345	**1,345**
December	2,627	1,132		1,132	1,880	**1,880**
Annual				**16,116**	**20,014**	**20,014**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$194	$158	$158	$176	**$ 176**
February		$231	$81	$81	$156	**$ 156**
March		$266	$48	$48	$157	**$ 157**
April		$226	$22	$22	$124	**$ 124**
May		$150	$143	$143	$147	**$ 147**
June		$239	$238	$238	$238	**$ 238**
July		$76	$188	$188	$132	**$ 132**
August		$244	$223	$223	$234	**$ 234**
September		$173	$224	$224	$199	**$ 199**
October		$179	$136	$136	$158	**$ 158**
November		$143	$136	$136	$140	**$ 140**
December	$270	$115		$115	$193	**$ 193**
Annual				**$1,713**	**$2,052**	**$ 2,052**

Account: 8680108357
Meter: AC16781
Rate: GS-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January				0	0	0
February				0	0	0
March				0	0	0
April				0	0	0
May		NOT		0	0	0
June		APPLICABLE		0	0	0
July				0	0	0
August				0	0	0
September				0	0	0
October				0	0	0
November				0	0	0
December				0	0	0
Annual				**0**	**0**	**0**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		111	123	123	117	**117**
February		111	106	106	109	**109**
March		125	115	115	120	**120**
April		110	110	110	110	**110**
May		109	125	125	117	**117**
June		121	114	114	118	**118**
July		113	110	110	112	**112**
August		124	121	121	123	**123**
September		113	114	114	114	**114**
October		110	121	121	116	**116**
November		122	115	115	119	**119**
December	132	114		114	123	**123**
Annual				**1,388**	**1,395**	**1,395**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$19	$22	$22	$21	**$ 21**
February		$19	$21	$21	$20	**$ 20**
March		$20	$22	$22	$21	**$ 21**
April		$19	$22	$22	$20	**$ 20**
May		$19	$23	$23	$21	**$ 21**
June		$20	$22	$22	$21	**$ 21**
July		$19	$22	$22	$20	**$ 20**
August		$20	$23	$23	$21	**$ 21**
September		$19	$22	$22	$20	**$ 20**
October		$19	$23	$23	$21	**$ 21**
November		$20	$22	$22	$21	**$ 21**
December	$21	$19		$19	$20	**$ 20**
Annual				**$262**	**$247**	**$ 247**

Account: 3292658550
Meter: MV3710A
Rate: SDTR-1A
Baseline: Average of Last Two Years

Month	High Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		64	62	62	63	**63**
February		59	59	59	59	**59**
March		64	63	63	64	**64**
April		61	63	63	62	**62**
May		67	70	70	69	**69**
June		51	49	49	50	**50**
July		51	52	52	52	**52**
August		55	56	56	56	**56**
September		56	53	53	55	**55**
October		71	70	70	71	**71**
November		66	64	64	65	**65**
December	66	65		65	66	**66**
Annual				**726**	**729**	**729**

Month	On-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		2,400	2,460	2,460	2,430	**2,430**
July		2,640	2,520	2,520	2,580	**2,580**
August		3,000	2,880	2,880	2,940	**2,940**
September		2,820	2,700	2,700	2,760	**2,760**
October		240	240	240	240	**240**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**10,800**	**10,950**	**10,950**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$1,705	$1,954	$1,954	$1,830	**$ 1,830**
February		$1,721	$1,769	$1,769	$1,745	**$ 1,745**
March		$2,028	$1,961	$1,961	$1,995	**$ 1,995**
April		$1,833	$2,006	$2,006	$1,919	**$ 1,919**
May		$2,034	$2,457	$2,457	$2,246	**$ 2,246**
June		$2,158	$2,220	$2,220	$2,189	**$ 2,189**
July		$2,140	$2,297	$2,297	$2,218	**$ 2,218**
August		$2,357	$2,534	$2,534	$2,446	**$ 2,446**
September		$2,278	$2,354	$2,354	$2,316	**$ 2,316**
October		$2,186	$2,423	$2,423	$2,305	**$ 2,305**
November		$2,002	$2,021	$2,021	$2,012	**$ 2,012**
December	$2,503	$1,967		$1,967	$2,235	**$ 2,235**
Annual				**$25,964**	**$25,455**	**$ 25,455**

Site Name: Integ Waste South Landfill
(Continued)

Month	On-Peak Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		51	49	49	50	**50**
July		51	52	52	52	**52**
August		55	56	56	56	**56**
September		56	53	53	55	**55**
October		49	52	52	51	**51**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**262**	**262**	**262**

Month	Total Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		178	179	179	179	**179**
February		178	176	176	177	**177**
March		178	179	179	179	**179**
April		168	175	175	172	**172**
May		175	180	180	178	**178**
June		152	132	132	142	**142**
July		155	144	144	150	**150**
August		174	140	140	157	**157**
September		169	149	149	159	**159**
October		179	158	158	169	**169**
November		171	153	153	162	**162**
December	159	174		174	167	**167**
Annual				**1,939**	**1,988**	**1,988**

Month	Off-Peak Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		18,720	22,740	22,740	20,730	**20,730**
February		19,980	19,980	19,980	19,980	**19,980**
March		24,600	21,720	21,720	23,160	**23,160**
April		22,680	22,500	22,500	22,590	**22,590**
May		25,380	29,040	29,040	27,210	**27,210**
June		28,200	25,500	25,500	26,850	**26,850**
July		27,000	26,160	26,160	26,580	**26,580**
August		29,880	28,980	28,980	29,430	**29,430**
September		28,380	26,580	26,580	27,480	**27,480**
October		27,360	28,200	28,200	27,780	**27,780**
November		25,020	22,560	22,560	23,790	**23,790**
December	31,440	24,540		24,540	27,990	**27,990**
Annual				**298,500**	**303,570**	**303,570**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		77,188	94,500	94,500	85,844	**85,844**
February		70,578	78,744	78,744	74,661	**74,661**
March		77,666	81,110	81,110	79,388	**79,388**
April		77,775	85,413	85,413	81,594	**81,594**
May		74,623	88,320	88,320	81,472	**81,472**
June		86,438	90,128	90,128	88,283	**88,283**
July		93,963	82,210	82,210	88,087	**88,087**
August		94,187	82,273	82,273	88,230	**88,230**
September		96,668	84,428	84,428	90,548	**90,548**
October		86,899	76,676	76,676	81,788	**81,788**
November		81,007	70,643	70,643	75,825	**75,825**
December	82,782	83,432		83,432	83,107	**83,107**
Annual				**997,877**	**998,826**	**998,826**

Month	Total Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$6,193	$7,251	$7,251	$6,722	**$ 6,722**
February		$5,904	$6,381	$6,381	$6,142	**$ 6,142**
March		$6,354	$6,743	$6,743	$6,549	**$ 6,549**
April		$6,022	$6,913	$6,913	$6,467	**$ 6,467**
May		$5,993	$7,250	$7,250	$6,621	**$ 6,621**
June		$6,372	$6,910	$6,910	$6,641	**$ 6,641**
July		$6,672	$6,615	$6,615	$6,643	**$ 6,643**
August		$7,056	$6,612	$6,612	$6,834	**$ 6,834**
September		$7,046	$6,822	$6,822	$6,934	**$ 6,934**
October		$6,622	$6,392	$6,392	$6,507	**$ 6,507**
November		$6,176	$5,959	$5,959	$6,067	**$ 6,067**
December	$6,640	$6,246		$6,246	$6,443	**$ 6,443**
Annual				**$80,094**	**$78,571**	**$ 78,571**

Site Name: Booher Building
Service Address: 3275 NW 99TH WAY
Square Feet: 53,060

Electric History

Account: 1789736053
Meter: DV37593
Rate: GSDT-1
Baseline: Average of Last Two Years

Month	On-Peak Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		230	242	242	236	**236**
February		224	241	241	233	**233**
March		222	250	250	236	**236**
April		248	256	256	252	**252**
May		293	265	265	279	**279**
June		278	272	272	275	**275**
July	285	287	284	284	286	**286**
August	298	301	285	285	293	**293**
September	296	260	285	285	273	**273**
October	293	278	265	265	272	**272**
November	262	248	227	227	238	**238**
December	233	246		246	240	**240**
Annual				**3,118**	**3,110**	**3,110**

Month	On-Peak Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		23,040	26,580	26,580	24,810	**24,810**
February		25,140	25,800	25,800	25,470	**25,470**
March		29,460	29,280	29,280	29,370	**29,370**
April		35,580	37,740	37,740	36,660	**36,660**
May		40,260	42,420	42,420	41,340	**41,340**
June		42,720	42,960	42,960	42,840	**42,840**
July	43,440	45,480	43,560	43,560	44,520	**44,520**
August	47,520	48,780	49,260	49,260	49,020	**49,020**
September	44,580	43,080	47,040	47,040	45,060	**45,060**
October	41,400	41,340	44,160	44,160	42,750	**42,750**
November	32,820	29,700	31,320	31,320	30,510	**30,510**
December	34,200	31,320		31,320	32,760	**32,760**
Annual				**451,440**	**445,110**	**445,110**

Month	Off-Peak Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		78,780	93,540	93,540	86,160	**86,160**
February		75,120	85,320	85,320	80,220	**80,220**
March		95,760	89,400	89,400	92,580	**92,580**
April		83,280	91,200	91,200	87,240	**87,240**
May		93,360	112,380	112,380	102,870	**102,870**
June		118,260	105,360	105,360	111,810	**111,810**
July	104,280	115,140	114,840	114,840	114,990	**114,990**
August	107,280	124,200	129,900	129,900	127,050	**127,050**
September	118,500	109,260	117,780	117,780	113,520	**113,520**
October	94,980	95,580	115,860	115,860	105,720	**105,720**
November	99,180	103,260	101,340	101,340	102,300	**102,300**
December	118,620	103,380		103,380	111,000	**111,000**
Annual				**1,260,300**	**1,235,460**	**1,235,460**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	101,820	120,120	120,120	110,970	**110,970**
February	0	100,260	111,120	111,120	105,690	**105,690**
March	0	125,220	118,680	118,680	121,950	**121,950**
April	0	118,860	128,940	128,940	123,900	**123,900**
May	0	133,620	154,800	154,800	144,210	**144,210**
June	0	160,980	148,320	148,320	154,650	**154,650**
July	147,720	160,620	158,400	158,400	159,510	**159,510**
August	154,800	172,980	179,160	179,160	176,070	**176,070**
September	163,080	152,340	164,820	164,820	158,580	**158,580**
October	136,380	136,920	160,020	160,020	148,470	**148,470**
November	132,000	132,960	132,660	132,660	132,810	**132,810**
December	152,820	134,700	0	134,700	143,760	**143,760**
Annual				**1,711,740**	**1,680,570**	**1,680,570**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$7,833	$9,143	$9,143	$8,488	**$ 8,488**
February		$7,808	$8,704	$8,704	$8,256	**$ 8,256**
March		$9,040	$9,574	$9,574	$9,307	**$ 9,307**
April		$9,029	$10,446	$10,446	$9,737	**$ 9,737**
May		$10,319	$11,935	$11,935	$11,127	**$ 11,127**
June		$11,327	$11,742	$11,742	$11,534	**$ 11,534**
July	$11,698	$11,540	$12,372	$12,372	$11,956	**$ 11,956**
August	$12,341	$12,325	$13,573	$13,573	$12,949	**$ 12,949**
September	$12,488	$10,778	$12,815	$12,815	$11,796	**$ 11,796**
October	$11,160	$10,310	$12,249	$12,249	$11,280	**$ 11,280**
November	$10,107	$9,291	$10,037	$10,037	$9,664	**$ 9,664**
December	$10,846	$9,408		$9,408	$10,127	**$ 10,127**
Annual				**$131,997**	**$126,221**	**$ 126,221**

Site Name: Family Success Center, North
Service Address: 2011 NW 3rd Avenue Pampano Beach FL 33060
Square Feet: 11,929

Electric History

Account: 5656364956
Meter: KJ39709
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		21	0	0	11	**11**
February		19	0	0	10	**10**
March		18	0	0	9	**9**
April		19	0	0	10	**10**
May		17	0	0	9	**9**
June		18	0	0	9	**9**
July		18	0	0	9	**9**
August		17	0	0	9	**9**
September		17	0	0	9	**9**
October		16	0	0	8	**8**
November		17	0	0	9	**9**
December	21	17		17	19	**19**
Annual				**17**	**118**	**118**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		7,967	6,208	6,208	7,088	**7,088**
February		5,627	5,277	5,277	5,452	**5,452**
March		5,712	5,136	5,136	5,424	**5,424**
April		6,058	4,488	4,488	5,273	**5,273**
May		5,240	4,482	4,482	4,861	**4,861**
June		6,861	5,308	5,308	6,085	**6,085**
July		8,284	6,581	6,581	7,433	**7,433**
August		7,574	6,154	6,154	6,864	**6,864**
September		8,422	5,860	5,860	7,141	**7,141**
October		7,140	4,416	4,416	5,778	**5,778**
November		6,174	4,845	4,845	5,510	**5,510**
December	6,989	5,757		5,757	6,373	**6,373**
Annual				**64,512**	**73,280**	**73,280**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$691	$619	$619	$655	**$ 655**
February		$540	$528	$528	$534	**$ 534**
March		$535	$531	$531	$533	**$ 533**
April		$550	$465	$465	$508	**$ 508**
May		$485	$465	$465	$475	**$ 475**
June		$581	$549	$549	$565	**$ 565**
July		$655	$678	$678	$666	**$ 666**
August		$607	$635	$635	$621	**$ 621**
September		$649	$604	$604	$627	**$ 627**
October		$571	$458	$458	$515	**$ 515**
November		$533	$502	$502	$517	**$ 517**
December	$661	$511		$511	$586	**$ 586**
Annual				**$6,545**	**$6,801**	**$ 6,801**

Account: 5657362983
Meter: KJ39744
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		23	23	23	23	**23**
February		22	20	20	21	**21**
March		22	21	21	22	**22**
April		23	22	22	23	**23**
May		23	23	23	23	**23**
June		26	24	24	25	**25**
July		25	24	24	25	**25**
August		25	25	25	25	**25**
September		25	25	25	25	**25**
October		25	25	25	25	**25**
November		23	25	25	24	**24**
December	24	24		24	24	**24**
Annual				**281**	**284**	**284**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		7,002	7,117	7,117	7,060	**7,060**
February		5,264	6,070	6,070	5,667	**5,667**
March		5,767	6,757	6,757	6,262	**6,262**
April		7,113	7,245	7,245	7,179	**7,179**
May		6,530	7,269	7,269	6,900	**6,900**
June		7,701	7,592	7,592	7,647	**7,647**
July		9,325	8,989	8,989	9,157	**9,157**
August		8,525	8,149	8,149	8,337	**8,337**
September		9,592	8,195	8,195	8,894	**8,894**
October		8,564	7,325	7,325	7,945	**7,945**
November		7,835	7,237	7,237	7,536	**7,536**
December	6,725	7,405		7,405	7,065	**7,065**
Annual				**89,350**	**89,647**	**89,647**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$660	$690	$690	$675	**$ 675**
February		$553	$597	$597	$575	**$ 575**
March		$582	$664	$664	$623	**$ 623**
April		$650	$704	$704	$677	**$ 677**
May		$620	$717	$717	$668	**$ 668**
June		$715	$747	$747	$731	**$ 731**
July		$788	$829	$829	$808	**$ 808**
August		$746	$791	$791	$769	**$ 769**
September		$800	$794	$794	$797	**$ 797**
October		$747	$743	$743	$745	**$ 745**
November		$687	$738	$738	$712	**$ 712**
December	$680	$676		$676	$678	**$ 678**
Annual				**$8,690**	**$8,459**	**$ 8,459**

Site Name: Family Success Center, North
(Continued)

Account: 5662367902
Meter: KJ39745
Rate: GS-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January				0	0	0
February				0	0	0
March				0	0	0
April				0	0	0
May		NOT		0	0	0
June		APPLICABLE		0	0	0
July				0	0	0
August				0	0	0
September				0	0	0
October				0	0	0
November				0	0	0
December				0	0	0
Annual				**0**	**0**	**0**

Month	Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		2,055	1,364	1,364	1,710	**1,710**
February		2,608	1,760	1,760	2,184	**2,184**
March		2,435	1,681	1,681	2,058	**2,058**
April		2,884	1,719	1,719	2,302	**2,302**
May		1,960	1,364	1,364	1,662	**1,662**
June		1,950	1,102	1,102	1,526	**1,526**
July		1,522	1,113	1,113	1,318	**1,318**
August		1,217	943	943	1,080	**1,080**
September		945	894	894	920	**920**
October		1,024	1,206	1,206	1,115	**1,115**
November		1,022	1,273	1,273	1,148	**1,148**
December	1,462	1,128		1,128	1,295	**1,295**
Annual				**15,547**	**18,316**	**18,316**

Month	Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$219	$140	$140	$180	**$ 180**
February		$275	$178	$178	$227	**$ 227**
March		$258	$171	$171	$214	**$ 214**
April		$303	$175	$175	$239	**$ 239**
May		$209	$141	$141	$175	**$ 175**
June		$208	$115	$115	$162	**$ 162**
July		$165	$116	$116	$141	**$ 141**
August		$134	$101	$101	$118	**$ 118**
September		$103	$96	$96	$100	**$ 100**
October		$111	$127	$127	$119	**$ 119**
November		$107	$137	$137	$122	**$ 122**
December	$159	$117		$117	$138	**$ 138**
Annual				**$1,616**	**$1,934**	**$ 1,934**

Account: 5663365939
Meter: KJ39743
Rate: GS-1
Baseline:

Month	Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January				0	0	0
February				0	0	0
March				0	0	0
April				0	0	0
May		NOT		0	0	0
June		APPLICABLE		0	0	0
July				0	0	0
August				0	0	0
September				0	0	0
October				0	0	0
November				0	0	0
December				0	0	0
Annual				**0**	**0**	**0**

Month	Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		2,176	1,849	1,849	2,013	**2,013**
February		1,408	1,446	1,446	1,427	**1,427**
March		1,526	1,603	1,603	1,565	**1,565**
April		2,044	1,800	1,800	1,922	**1,922**
May		2,093	2,052	2,052	2,073	**2,073**
June		2,658	2,504	2,504	2,581	**2,581**
July		3,359	2,988	2,988	3,174	**3,174**
August		3,096	2,850	2,850	2,973	**2,973**
September		3,125	2,913	2,913	3,019	**3,019**
October		2,594	2,381	2,381	2,488	**2,488**
November		2,090	2,173	2,173	2,132	**2,132**
December	1,916	1,849		1,849	1,883	**1,883**
Annual				**26,408**	**27,247**	**27,247**

Month	Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$223	$192	$192	$207	**$ 207**
February		$147	$152	$152	$150	**$ 150**
March		$159	$173	$173	$166	**$ 166**
April		$206	$193	$193	$200	**$ 200**
May		$211	$219	$219	$215	**$ 215**
June		$266	$265	$265	$265	**$ 265**
July		$334	$314	$314	$324	**$ 324**
August		$308	$300	$300	$304	**$ 304**
September		$310	$306	$306	$308	**$ 308**
October		$259	$252	$252	$256	**$ 256**
November		$210	$231	$231	$221	**$ 221**
December	$203	$187		$187	$195	**$ 195**
Annual				**$2,784**	**$2,810**	**$ 2,810**

Site Name: Family Success Center, North
(Continued)

Account: 5664363966
Meter: KJ39746
Rate: GS-1
Baseline:

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January				0	0	0
February				0	0	0
March				0	0	0
April				0	0	0
May		NOT		0	0	0
June		APPLICABLE		0	0	0
July				0	0	0
August				0	0	0
September				0	0	0
October				0	0	0
November				0	0	0
December				0	0	0
Annual				**0**	**0**	**0**

Month	Total Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	44	23	23	34	**34**
February	0	41	20	20	31	**31**
March	0	40	21	21	31	**31**
April	0	42	22	22	32	**32**
May	0	40	23	23	32	**32**
June	0	44	24	24	34	**34**
July	0	43	24	24	34	**34**
August	0	42	25	25	34	**34**
September	0	42	25	25	34	**34**
October	0	41	25	25	33	**33**
November	0	40	25	25	33	**33**
December	45	41	0	41	43	**43**
Annual				**298**	**401**	**401**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		2,735	2,278	2,278	2,507	**2,507**
February		1,585	2,030	2,030	1,808	**1,808**
March		1,876	2,015	2,015	1,946	**1,946**
April		2,768	2,130	2,130	2,449	**2,449**
May		2,837	2,585	2,585	2,711	**2,711**
June		3,802	3,298	3,298	3,550	**3,550**
July		4,618	4,084	4,084	4,351	**4,351**
August		4,523	3,506	3,506	4,015	**4,015**
September		4,715	3,497	3,497	4,106	**4,106**
October		3,639	2,870	2,870	3,255	**3,255**
November		2,909	2,253	2,253	2,581	**2,581**
December	2,838	2,271		2,271	2,555	**2,555**
Annual				**32,817**	**35,831**	**35,831**

Month	Total Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	21,935	18,816	18,816	20,376	**20,376**
February	0	16,492	16,583	16,583	16,538	**16,538**
March	0	17,316	17,192	17,192	17,254	**17,254**
April	0	20,867	17,382	17,382	19,125	**19,125**
May	0	18,660	17,752	17,752	18,206	**18,206**
June	0	22,972	19,804	19,804	21,388	**21,388**
July	0	27,108	23,755	23,755	25,432	**25,432**
August	0	24,935	21,602	21,602	23,269	**23,269**
September	0	26,799	21,359	21,359	24,079	**24,079**
October	0	22,961	18,198	18,198	20,580	**20,580**
November	0	20,030	17,781	17,781	18,906	**18,906**
December	19,930	18,410	0	18,410	19,170	**19,170**
Annual				**228,634**	**244,320**	**244,320**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$278	$234	$234	$256	**$ 256**
February		$164	$210	$210	$187	**$ 187**
March		$194	$215	$215	$204	**$ 204**
April		$276	$227	$227	$251	**$ 251**
May		$283	$273	$273	$278	**$ 278**
June		$377	$345	$345	$361	**$ 361**
July		$456	$425	$425	$440	**$ 440**
August		$447	$366	$366	$406	**$ 406**
September		$464	$365	$365	$414	**$ 414**
October		$360	$302	$302	$331	**$ 331**
November		$289	$239	$239	$264	**$ 264**
December	$297	$228		$228	$262	**$ 262**
Annual				**$3,427**	**$3,656**	**$ 3,656**

Month	Total Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$0	$2,070	$1,876	$1,876	$1,973	**$ 1,973**
February	$0	$1,679	$1,665	$1,665	$1,672	**$ 1,672**
March	$0	$1,727	$1,754	$1,754	$1,741	**$ 1,741**
April	$0	$1,986	$1,764	$1,764	$1,875	**$ 1,875**
May	$0	$1,809	$1,813	$1,813	$1,811	**$ 1,811**
June	$0	$2,147	$2,021	$2,021	$2,084	**$ 2,084**
July	$0	$2,397	$2,361	$2,361	$2,379	**$ 2,379**
August	$0	$2,242	$2,193	$2,193	$2,218	**$ 2,218**
September	$0	$2,326	$2,166	$2,166	$2,246	**$ 2,246**
October	$0	$2,048	$1,882	$1,882	$1,965	**$ 1,965**
November	$0	$1,826	$1,847	$1,847	$1,837	**$ 1,837**
December	$2,000	$1,719	$0	$1,719	$1,859	**$ 1,859**
Annual				**$23,062**	**$23,660**	**$ 23,660**

Site Name: Sexual Assault Treatment Center
Service Address: 400 NE 4TH ST FORT LAUDERDALE FL, 33301
Square Feet: 10,643

Electric History

Account: 8203046332
Meter: KU35317
Rate: GSD-1
Baseline: Average of Last Two Years

	Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		43	41	41	42	**42**
February	32	37	32	32	35	**35**
March	35	37	44	44	41	**41**
April	37	40	45	45	43	**43**
May	36	44	46	46	45	**45**
June	40	47	50	50	49	**49**
July	37	50	52	52	51	**51**
August	43	45	52	52	49	**49**
September	47	47	51	51	49	**49**
October	41	49	44	44	47	**47**
November	40	44	41	41	43	**43**
December	38	44		44	41	**41**
Annual				**542**	**532**	**532**

	Total Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		16,080	13,680	13,680	14,880	**14,880**
February	10,860	9,540	11,760	11,760	10,650	**10,650**
March	9,840	11,100	12,480	12,480	11,790	**11,790**
April	13,260	12,780	13,620	13,620	13,200	**13,200**
May	13,080	13,860	15,120	15,120	14,490	**14,490**
June	14,100	17,040	16,560	16,560	16,800	**16,800**
July	14,100	18,300	19,860	19,860	19,080	**19,080**
August	14,100	19,020	18,540	18,540	18,780	**18,780**
September	19,860	18,960	17,760	17,760	18,360	**18,360**
October	15,420	16,860	14,700	14,700	15,780	**15,780**
November	14,760	15,120	14,700	14,700	14,910	**14,910**
December	14,820	13,200		13,200	14,010	**14,010**
Annual				**181,980**	**182,730**	**182,730**

	Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$1,380	$1,266	$1,266	$1,323	**$ 1,323**
February	$1,042	$954	$1,055	$1,055	$1,004	**$ 1,004**
March	$1,019	$1,042	$1,265	$1,265	$1,154	**$ 1,154**
April	$1,248	$1,136	$1,343	$1,343	$1,240	**$ 1,240**
May	$1,185	$1,237	$1,443	$1,443	$1,340	**$ 1,340**
June	$1,290	$1,437	$1,574	$1,574	$1,505	**$ 1,505**
July	$1,256	$1,536	$1,790	$1,790	$1,663	**$ 1,663**
August	$1,325	$1,517	$1,713	$1,713	$1,615	**$ 1,615**
September	$1,694	$1,533	$1,655	$1,655	$1,594	**$ 1,594**
October	$1,372	$1,447	$1,395	$1,395	$1,421	**$ 1,421**
November	$1,323	$1,301	$1,361	$1,361	$1,331	**$ 1,331**
December	$1,303	$1,202		$1,202	$1,253	**$ 1,253**
Annual				**$17,061**	**$16,442**	**$ 16,442**

Site Name: EPD Environmental Facility & Testing
Service Address: 3211 College Avenue Davie FL
Square Feet: 9,694

Electric History

Account: 3194057505
Meter: MU5747A
Rate: SDTR-1A
Baseline: Average of Last Two Years

	High Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		139	156	156	148	**148**
February		142	158	158	150	**150**
March		122	157	157	140	**140**
April		132	148	148	140	**140**
May		126	139	139	133	**133**
June		122	161	161	142	**142**
July		118	160	160	139	**139**
August		187	108	108	148	**148**
September		185	133	133	159	**159**
October		197	160	160	179	**179**
November		176	188	188	182	**182**
December	140	170		170	155	**155**
Annual				**1,838**	**1,812**	**1,812**

	On-Peak Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		122	161	161	142	**142**
July		118	160	160	139	**139**
August		187	108	108	148	**148**
September		185	133	133	159	**159**
October		193	156	156	175	**175**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**718**	**762**	**762**

	On-Peak Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	0	0	0	**0**
May		0	0	0	0	**0**
June		3,720	6,360	6,360	5,040	**5,040**
July		6,720	7,920	7,920	7,320	**7,320**
August		10,080	4,680	4,680	7,380	**7,380**
September		10,080	4,200	4,200	7,140	**7,140**
October		3,360	2,280	2,280	2,820	**2,820**
November		0	0	0	0	**0**
December	0	0		0	0	**0**
Annual				**25,440**	**29,700**	**29,700**

	Off-Peak Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		78,720	94,920	94,920	86,820	**86,820**
February		60,960	78,960	78,960	69,960	**69,960**
March		67,680	80,640	80,640	74,160	**74,160**
April		64,560	87,480	87,480	76,020	**76,020**
May		59,280	84,360	84,360	71,820	**71,820**
June		67,080	99,360	99,360	83,220	**83,220**
July		64,440	83,280	83,280	73,860	**73,860**
August		103,200	45,960	45,960	74,580	**74,580**
September		99,960	41,280	41,280	70,620	**70,620**
October		100,320	85,560	85,560	92,940	**92,940**
November		90,000	93,240	93,240	91,620	**91,620**
December	83,400	99,840		99,840	91,620	**91,620**
Annual				**974,880**	**957,240**	**957,240**

	Total Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	0	78,720	94,920	94,920	86,820	**86,820**
February	0	60,960	78,960	78,960	69,960	**69,960**
March	0	67,680	80,640	80,640	74,160	**74,160**
April	0	64,560	87,480	87,480	76,020	**76,020**
May	0	59,280	84,360	84,360	71,820	**71,820**
June	0	70,800	105,720	105,720	88,260	**88,260**
July	0	71,160	91,200	91,200	81,180	**81,180**
August	0	113,280	50,640	50,640	81,960	**81,960**
September	0	110,040	45,480	45,480	77,760	**77,760**
October	0	103,680	87,840	87,840	95,760	**95,760**
November	0	90,000	93,240	93,240	91,620	**91,620**
December	83,400	99,840	0	99,840	91,620	**91,620**
Annual				**1,000,320**	**986,940**	**986,940**

	Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$5,842	$7,083	$7,083	$6,463	**$ 6,463**
February		$4,896	$6,213	$6,213	$5,554	**$ 5,554**
March		$5,068	$6,498	$6,498	$5,783	**$ 5,783**
April		$4,812	$6,796	$6,796	$5,804	**$ 5,804**
May		$4,473	$6,513	$6,513	$5,493	**$ 5,493**
June		$4,942	$7,932	$7,932	$6,437	**$ 6,437**
July		$5,177	$7,322	$7,322	$6,250	**$ 6,250**
August		$8,158	$4,342	$4,342	$6,250	**$ 6,250**
September		$7,974	$4,351	$4,351	$6,162	**$ 6,162**
October		$7,534	$6,954	$6,954	$7,244	**$ 7,244**
November		$6,599	$7,583	$7,583	$7,091	**$ 7,091**
December	$6,336	$7,041		$7,041	$6,688	**$ 6,688**
Annual				**$78,628**	**$75,219**	**$ 75,219**

Site Name: EAP Our House
Service Address: 408 NE 4TH ST FORT LAUDERDALE FL, 33301
Square Feet: 1,127

Electric History

Account: 8673629534
Meter: AC41715
Rate: GS-1
Baseline: Average of Last Two Years

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		832	1,181	1,181	1,007	**1,007**
February		652	875	875	764	**764**
March		938	923	923	931	**931**
April		1,258	972	972	1,115	**1,115**
May		1,343	1,151	1,151	1,247	**1,247**
June		1,565	1,361	1,361	1,463	**1,463**
July		1,758	1,685	1,685	1,722	**1,722**
August		1,895	1,550	1,550	1,723	**1,723**
September		1,811	1,695	1,695	1,753	**1,753**
October		1,615	1,446	1,446	1,531	**1,531**
November		1,454	1,321	1,321	1,388	**1,388**
December	814	1,257		1,257	1,036	**1,036**
Annual				**15,417**	**15,676**	**15,676**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		$90	$127	$127	$108	**$ 108**
February		$72	$97	$97	$85	**$ 85**
March		$101	$105	$105	$103	**$ 103**
April		$130	$110	$110	$120	**$ 120**
May		$138	$128	$128	$133	**$ 133**
June		$160	$149	$149	$155	**$ 155**
July		$179	$182	$182	$180	**$ 180**
August		$192	$168	$168	$180	**$ 180**
September		$183	$183	$183	$183	**$ 183**
October		$164	$158	$158	$161	**$ 161**
November		$149	$145	$145	$147	**$ 147**
December	$91	$130		$130	$110	**$ 110**
Annual				**$1,680**	**$1,665**	**$ 1,665**

Site Name: MASS TRAN, North Maintenance
Service Address: 3201 W COPANS RD POMPANO BEACH FL, 33069
Square Feet: 195,189

Electric History

Account: 689855393
Meter: MV87032
Rate: GSDT-1
Baseline: Average of Last Two Years

Month	On-Peak Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		388	384	384	386	**386**
February		348	352	352	350	**350**
March		344	360	360	352	**352**
April		372	368	368	370	**370**
May		388	400	400	394	**394**
June		392	408	408	400	**400**
July		408	400	400	404	**404**
August		412	408	408	410	**410**
September		412	436	436	424	**424**
October		436	444	444	440	**440**
November		368	404	404	386	**386**
December	396	360		360	378	**378**
Annual				**4,724**	**4,694**	**4,694**

Month	On-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		56,800	56,000	56,000	56,400	**56,400**
February		48,400	49,200	49,200	48,800	**48,800**
March		53,200	50,000	50,000	51,600	**51,600**
April		58,800	56,400	56,400	57,600	**57,600**
May		57,200	62,000	62,000	59,600	**59,600**
June		62,000	64,400	64,400	63,200	**63,200**
July		66,400	62,400	62,400	64,400	**64,400**
August		69,600	64,400	64,400	67,000	**67,000**
September		65,200	68,400	68,400	66,800	**66,800**
October		66,000	68,000	68,000	67,000	**67,000**
November		56,000	58,400	58,400	57,200	**57,200**
December	55,600	53,600		53,600	54,600	**54,600**
Annual				**713,200**	**714,200**	**714,200**

Month	Off-Peak Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		195,200	189,200	189,200	192,200	**192,200**
February		146,800	145,200	145,200	146,000	**146,000**
March		157,600	147,600	147,600	152,600	**152,600**
April		176,800	170,000	170,000	173,400	**173,400**
May		153,200	160,000	160,000	156,600	**156,600**
June		170,000	186,000	186,000	178,000	**178,000**
July		195,600	172,800	172,800	184,200	**184,200**
August		182,000	168,000	168,000	175,000	**175,000**
September		193,600	196,400	196,400	195,000	**195,000**
October		174,800	174,400	174,400	174,600	**174,600**
November		158,800	162,400	162,400	160,600	**160,600**
December	172,400	166,800		166,800	169,600	**169,600**
Annual				**2,038,800**	**2,057,800**	**2,057,800**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$17,340	$17,435	$17,435	$17,388	**$ 17,388**
February		$14,179	$14,557	$14,557	$14,368	**$ 14,368**
March		$15,052	$15,315	$15,315	$15,184	**$ 15,184**
April		$15,982	$16,997	$16,997	$16,489	**$ 16,489**
May		$15,120	$17,379	$17,379	$16,250	**$ 16,250**
June		$16,232	$18,897	$18,897	$17,565	**$ 17,565**
July		$17,771	$18,019	$18,019	$17,895	**$ 17,895**
August		$17,560	$18,059	$18,059	$17,809	**$ 17,809**
September		$17,590	$20,040	$20,040	$18,815	**$ 18,815**
October		$17,207	$19,074	$19,074	$18,141	**$ 18,141**
November		$14,985	$17,234	$17,234	$16,109	**$ 16,109**
December	$16,935	$15,001		$15,001	$15,968	**$ 15,968**
Annual				**$208,007**	**$201,980**	**$ 201,980**

Site Name: MASS TRAN, North Maintenance
(Continued)

Account: 8985734287
Meter: MNL8190
Rate: GSDT-1
Baseline: Average of Last Two Years

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
On-Peak Demand (kW)						
January		92	98	98	95	**95**
February		92	96	96	94	**94**
March		93	97	97	95	**95**
April		86	94	94	90	**90**
May		86	91	91	89	**89**
June		95	83	83	89	**89**
July		93	81	81	87	**87**
August		110	80	80	95	**95**
September		96	78	78	87	**87**
October		94	75	75	85	**85**
November		91	74	74	83	**83**
December	93	92		92	93	**93**
Annual				**1,039**	**1,080**	**1,080**

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
Total On-Peak Demand (kW)						
January		480	482	482	481	**481**
February		440	448	448	444	**444**
March		437	457	457	447	**447**
April		458	462	462	460	**460**
May		474	491	491	483	**483**
June		487	491	491	489	**489**
July		501	481	481	491	**491**
August		522	488	488	505	**505**
September		508	514	514	511	**511**
October		530	519	519	525	**525**
November		459	478	478	469	**469**
December	489	452		452	471	**471**
Annual				**5,763**	**5,774**	**5,774**

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
On-Peak Consumption (kWh)						
January		12,631	15,232	15,232	13,932	**13,932**
February		11,155	13,630	13,630	12,393	**12,393**
March		13,015	14,082	14,082	13,549	**13,549**
April		13,618	14,739	14,739	14,179	**14,179**
May		14,208	14,979	14,979	14,594	**14,594**
June		14,008	14,140	14,140	14,074	**14,074**
July		15,489	13,112	13,112	14,301	**14,301**
August		15,781	12,871	12,871	14,326	**14,326**
September		15,049	12,803	12,803	13,926	**13,926**
October		14,917	12,339	12,339	13,628	**13,628**
November		13,875	11,726	11,726	12,801	**12,801**
December	11,762	13,381		13,381	12,572	**12,572**
Annual				**163,034**	**164,271**	**164,271**

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
Off-Peak Consumption (kWh)						
January		42,950	54,339	54,339	48,645	**48,645**
February		35,865	43,834	43,834	39,850	**39,850**
March		36,502	44,255	44,255	40,379	**40,379**
April		38,452	47,466	47,466	42,959	**42,959**
May		32,843	42,291	42,291	37,567	**37,567**
June		38,551	44,318	44,318	41,435	**41,435**
July		47,572	37,502	37,502	42,537	**42,537**
August		42,477	34,418	34,418	38,448	**38,448**
September		47,187	38,698	38,698	42,943	**42,943**
October		41,193	33,155	33,155	37,174	**37,174**
November		39,780	33,822	33,822	36,801	**36,801**
December	35,479	43,734		43,734	39,607	**39,607**
Annual				**497,832**	**488,342**	**488,342**

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
Total Consumption (kWh)						
January		307,581	314,771	314,771	311,176	**311,176**
February		242,220	251,864	251,864	247,042	**247,042**
March		260,317	255,937	255,937	258,127	**258,127**
April		287,670	288,605	288,605	288,138	**288,138**
May		257,451	279,270	279,270	268,361	**268,361**
June		284,559	308,858	308,858	296,709	**296,709**
July		325,061	285,814	285,814	305,438	**305,438**
August		309,858	279,689	279,689	294,774	**294,774**
September		321,036	316,301	316,301	318,669	**318,669**
October		296,910	287,894	287,894	292,402	**292,402**
November		268,455	266,348	266,348	267,402	**267,402**
December	275,241	277,515		277,515	276,378	**276,378**
Annual				**3,412,866**	**3,424,613**	**3,424,613**

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
Dollars						
January		$3,922	$4,814	$4,814	$4,368	**$ 4,368**
February		$3,502	$4,194	$4,194	$3,848	**$ 3,848**
March		$3,717	$4,407	$4,407	$4,062	**$ 4,062**
April		$3,626	$4,578	$4,578	$4,102	**$ 4,102**
May		$3,460	$4,324	$4,324	$3,892	**$ 3,892**
June		$3,769	$4,256	$4,256	$4,012	**$ 4,012**
July		$4,218	$3,828	$3,828	$4,023	**$ 4,023**
August		$4,239	$3,652	$3,652	$3,946	**$ 3,946**
September		$4,189	$3,822	$3,822	$4,005	**$ 4,005**
October		$3,925	$3,489	$3,489	$3,707	**$ 3,707**
November		$3,750	$3,457	$3,457	$3,603	**$ 3,603**
December	$3,669	$3,871		$3,871	$3,770	**$ 3,770**
Annual				**$48,693**	**$47,339**	**$ 47,339**

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
Total Dollars						
January		$21,263	$22,249	$22,249	$21,756	**$ 21,756**
February		$17,681	$18,751	$18,751	$18,216	**$ 18,216**
March		$18,770	$19,722	$19,722	$19,246	**$ 19,246**
April		$19,608	$21,575	$21,575	$20,591	**$ 20,591**
May		$18,580	$21,703	$21,703	$20,141	**$ 20,141**
June		$20,001	$23,153	$23,153	$21,577	**$ 21,577**
July		$21,989	$21,847	$21,847	$21,918	**$ 21,918**
August		$21,798	$21,711	$21,711	$21,755	**$ 21,755**
September		$21,779	$23,862	$23,862	$22,820	**$ 22,820**
October		$21,132	$22,564	$22,564	$21,848	**$ 21,848**
November		$18,735	$20,690	$20,690	$19,712	**$ 19,712**
December	$20,603	$18,872		$18,872	$19,738	**$ 19,738**
Annual				**$256,700**	**$249,319**	**$ 249,319**

Site Name: MASS TRAN, North Maintenance
(Continued)

Site Name: BSO Maintenance Facility
Service Address: 2027 NW 31ST AVE LAUDERDALE LAKES FL, 33311
Square Feet: 14,800

Electric History

Account: 670063593
Meter: KT38452
Rate: GSD-1
Baseline: Average of Last Two Years

	Demand (kW)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		40	37	37	39	**39**
February		41	40	40	41	**41**
March		41	37	37	39	**39**
April		43	41	41	42	**42**
May		41	41	41	41	**41**
June		44	40	40	42	**42**
July		43	41	41	42	**42**
August		44	42	42	43	**43**
September		41	41	41	41	**41**
October		41	41	41	41	**41**
November		34	38	38	36	**36**
December	40	38		38	39	**39**
Annual				**477**	**485**	**485**

	Total Consumption (kWh)					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		16,740	17,580	17,580	17,160	**17,160**
February		18,480	15,960	15,960	17,220	**17,220**
March		21,060	17,640	17,640	19,350	**19,350**
April		19,740	16,320	16,320	18,030	**18,030**
May		22,320	18,720	18,720	20,520	**20,520**
June		21,720	19,860	19,860	20,790	**20,790**
July		22,560	21,300	21,300	21,930	**21,930**
August		25,140	23,040	23,040	24,090	**24,090**
September		22,500	11,760	11,760	17,130	**17,130**
October		20,220	21,180	21,180	20,700	**20,700**
November		16,860	16,800	16,800	16,830	**16,830**
December	20,520	18,300		18,300	19,410	**19,410**
Annual				**218,460**	**233,160**	**233,160**

	Dollars					
Month	**2015**	**2016**	**2017**	**Most Recent 12 Months**	**Average of Last Two Years**	**Baseline Selected**
January		$1,383	$1,437	$1,437	$1,410	**$ 1,410**
February		$1,490	$1,381	$1,381	$1,435	**$ 1,435**
March		$1,636	$1,484	$1,484	$1,560	**$ 1,560**
April		$1,529	$1,453	$1,453	$1,491	**$ 1,491**
May		$1,640	$1,594	$1,594	$1,617	**$ 1,617**
June		$1,644	$1,650	$1,650	$1,647	**$ 1,647**
July		$1,677	$1,745	$1,745	$1,711	**$ 1,711**
August		$1,821	$1,859	$1,859	$1,840	**$ 1,840**
September		$1,647	$1,187	$1,187	$1,417	**$ 1,417**
October		$1,529	$1,738	$1,738	$1,633	**$ 1,633**
November		$1,277	$1,447	$1,447	$1,362	**$ 1,362**
December	$1,650	$1,396		$1,396	$1,523	**$ 1,523**
Annual				**$18,371**	**$18,646**	**$ 18,646**

Site Name: Broward County Justice Center Garage
Service Address: 612 S ANDREWS AVE #GARAGE FORT LAUDERDALE FL, 33301
Square Feet: 14,397

Electric History

Account: 9691881024
Meter: KNL7786
Rate: GSD-1
Baseline: Most Recent 12 Months

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January			48	48	48	**48**
February			48	48	48	**48**
March			48	48	48	**48**
April			48	48	48	**48**
May			48	48	48	**48**
June			47	47	47	**47**
July			49	49	49	**49**
August			53	53	53	**53**
September			46	46	46	**46**
October			47	47	47	**47**
November			47	47	47	**47**
December		48		48	48	**48**
Annual				**578**	**578**	**578**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January			22,282	22,282	22,282	**22,282**
February			22,282	22,282	22,282	**22,282**
March			22,282	22,282	22,282	**22,282**
April			22,282	22,282	22,282	**22,282**
May			22,282	22,282	22,282	**22,282**
June			20,037	20,037	20,037	**20,037**
July			25,562	25,562	25,562	**25,562**
August			22,289	22,289	22,289	**22,289**
September			23,206	23,206	23,206	**23,206**
October			18,583	18,583	18,583	**18,583**
November			24,015	24,015	24,015	**24,015**
December		22,282		22,282	22,282	**22,282**
Annual				**267,384**	**267,384**	**267,384**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January			$1,862	$1,862	$1,862	**$ 1,862**
February			$1,862	$1,862	$1,862	**$ 1,862**
March			$1,862	$1,862	$1,862	**$ 1,862**
April			$1,862	$1,862	$1,862	**$ 1,862**
May			$1,862	$1,862	$1,862	**$ 1,862**
June			$1,591	$1,591	$1,591	**$ 1,591**
July			$2,089	$2,089	$2,089	**$ 2,089**
August			$1,944	$1,944	$1,944	**$ 1,944**
September			$1,916	$1,916	$1,916	**$ 1,916**
October			$1,657	$1,657	$1,657	**$ 1,657**
November			$1,975	$1,975	$1,975	**$ 1,975**
December		$1,862		$1,862	$1,862	**$ 1,862**
Annual				**$22,344**	**$22,344**	**$ 22,344**

Account: 470263435
Meter: KV52580
Rate: GSD-1
Baseline: Most Recent 12 Months

Month	Demand (kW) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		0	0	0	0	**0**
February		0	0	0	0	**0**
March		0	0	0	0	**0**
April		0	79	79	40	**79**
May		0	79	79	40	**79**
June		0	76	76	38	**76**
July		0	73	73	37	**73**
August		0	74	74	37	**74**
September		0	74	74	37	**74**
October		0	77	77	39	**77**
November		0	77	77	39	**77**
December	0	0		0	0	**0**
Annual				**609**	**305**	**609**

Month	Consumption (kWh) 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		77,760	75,360	75,360	76,560	**75,360**
February		68,040	72,960	72,960	70,500	**72,960**
March		77,760	67,440	67,440	72,600	**67,440**
April		72,960	46,680	46,680	59,820	**46,680**
May		70,560	48,840	48,840	59,700	**48,840**
June		77,760	44,520	44,520	61,140	**44,520**
July		75,360	48,600	48,600	61,980	**48,600**
August		75,360	43,080	43,080	59,220	**43,080**
September		75,360	45,000	45,000	60,180	**45,000**
October		70,560	40,920	40,920	55,740	**40,920**
November		75,360	47,760	47,760	61,560	**47,760**
December	75,360	72,960		72,960	74,160	**72,960**
Annual				**654,120**	**773,160**	**654,120**

Month	Dollars 2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$5,417	$5,412	$5,412	$5,414	**$ 5,412**
February		$4,881	$5,277	$5,277	$5,079	**$ 5,277**
March		$5,434	$5,092	$5,092	$5,263	**$ 5,092**
April		$4,939	$3,670	$3,670	$4,304	**$ 3,670**
May		$4,815	$3,796	$3,796	$4,305	**$ 3,796**
June		$5,193	$3,511	$3,511	$4,352	**$ 3,511**
July		$5,068	$3,715	$3,715	$4,392	**$ 3,715**
August		$5,068	$3,403	$3,403	$4,236	**$ 3,403**
September		$5,054	$3,515	$3,515	$4,285	**$ 3,515**
October		$4,807	$3,311	$3,311	$4,059	**$ 3,311**
November		$5,057	$3,711	$3,711	$4,384	**$ 3,711**
December	$5,475	$4,933		$4,933	$5,204	**$ 4,933**
Annual				**$49,344**	**$55,275**	**$ 49,344**

Site Name: Broward County Justice Center Garage
(Continued)

Account: 6941462357
Meter: KNL7428
Rate: GSD-1
Baseline: Most Recent 12 Months

	Demand (kW)							Total Demand (kW)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected	Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		13	0	0	7	**0**	January		13	48	48	31	**48**
February		13	22	22	18	**22**	February		13	70	70	42	**70**
March		13	12	12	13	**12**	March		13	60	60	37	**60**
April		13	12	12	13	**12**	April		13	139	139	76	**139**
May		13	12	12	13	**12**	May		13	139	139	76	**139**
June		13	12	12	13	**12**	June		13	135	135	74	**135**
July		12	19	19	16	**19**	July		12	141	141	77	**141**
August		1	12	12	7	**12**	August	0	1	139	139	70	**139**
September		12	12	12	12	**12**	September	0	12	132	132	72	**132**
October		26	12	12	19	**12**	October	0	26	136	136	81	**136**
November		29	12	12	21	**12**	November	0	29	136	136	83	**136**
December	12	0		0	6	**0**	December	12	48		48	30	**48**
Annual				**137**	**154**	**137**	**Annual**				**1,324**	**747**	**1,324**

	Consumption (kWh)							Total Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected	Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		25	7	7	16	**7**	January		77,785	97,649	97,649	87,717	**97,649**
February		17	28	28	23	**28**	February		68,057	95,270	95,270	81,664	**95,270**
March		32	11	11	22	**11**	March		77,792	89,733	89,733	83,763	**89,733**
April		12	23	23	18	**23**	April		72,972	68,985	68,985	70,979	**68,985**
May		11	18	18	15	**18**	May		70,571	71,140	71,140	70,856	**71,140**
June		18	12	12	15	**12**	June		77,778	64,569	64,569	71,174	**64,569**
July		13	38	38	26	**38**	July		75,373	74,200	74,200	74,787	**74,200**
August		7	21	21	14	**21**	August	0	75,367	65,390	65,390	70,379	**65,390**
September		14	14	14	14	**14**	September	0	75,374	68,220	68,220	71,797	**68,220**
October		157	12	12	85	**12**	October	0	70,717	59,515	59,515	65,116	**59,515**
November		192	24	24	108	**24**	November	0	75,552	71,799	71,799	73,676	**71,799**
December	20	5		5	13	**5**	December	75,380	95,247		95,247	85,314	**95,247**
Annual				**213**	**366**	**213**	**Annual**				**921,717**	**907,218**	**921,717**

	Dollars							Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected	Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$166	$28	$28	$97	**$ 28**	January		$5,582	$7,301	$7,301	$6,442	**$ 7,301**
February		$165	$283	$283	$224	**$ 283**	February		$5,046	$7,422	$7,422	$6,234	**$ 7,422**
March		$166	$166	$166	$166	**$ 166**	March		$5,599	$7,120	$7,120	$6,360	**$ 7,120**
April		$170	$167	$167	$168	**$ 167**	April		$5,109	$5,699	$5,699	$5,404	**$ 5,699**
May		$170	$167	$167	$168	**$ 167**	May		$4,984	$5,825	$5,825	$5,405	**$ 5,825**
June		$170	$166	$166	$168	**$ 166**	June		$5,363	$5,268	$5,268	$5,315	**$ 5,268**
July		$159	$249	$249	$204	**$ 249**	July		$5,227	$6,053	$6,053	$5,640	**$ 6,053**
August		$34	$167	$167	$100	**$ 167**	August	$0	$5,102	$5,514	$5,514	$5,308	**$ 5,514**
September		$159	$166	$166	$163	**$ 166**	September	$0	$5,213	$5,597	$5,597	$5,405	**$ 5,597**
October		$325	$166	$166	$246	**$ 166**	October	$0	$5,132	$5,134	$5,134	$5,133	**$ 5,134**
November		$361	$167	$167	$264	**$ 167**	November	$0	$5,418	$5,853	$5,853	$5,635	**$ 5,853**
December	$161	$22		$22	$92	**$ 22**	December	$5,635	$6,817		$6,817	$6,226	**$ 6,817**
Annual				**$1,914**	**$2,059**	**$ 1,914**	**Annual**				**$73,602**	**$68,506**	**$ 73,602**

Site Name: HIGH & BRDG Mosquito Control, Pembroke
Service Address: 1501 S UNIVERSITY DR # FPM PEMBROKE PINES FL, 33025
Square Feet: 9,865

Electric History

Account: 7872455758
Meter: KJ66140
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	22	18	21	21	20	**20**
February	17	18	23	23	21	**21**
March	18	22	21	21	22	**22**
April	20	18	24	24	21	**21**
May	23	21	25	25	23	**23**
June	24	20	25	25	23	**23**
July	24	22	30	30	26	**26**
August	24	27	32	32	30	**30**
September	22	26	30	30	28	**28**
October	24	24	28	28	26	**26**
November	24	24	24	24	24	**24**
December	18	24		24	21	**21**
Annual				**307**	**283**	**283**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	6,722	6,330	8,520	8,520	7,425	**7,425**
February	6,379	5,800	6,615	6,615	6,208	**6,208**
March	6,508	6,640	7,172	7,172	6,906	**6,906**
April	7,171	7,021	7,674	7,674	7,348	**7,348**
May	7,661	7,596	10,183	10,183	8,890	**8,890**
June	8,617	8,206	11,327	11,327	9,767	**9,767**
July	8,918	9,487	13,452	13,452	11,470	**11,470**
August	8,947	10,976	12,985	12,985	11,981	**11,981**
September	8,474	12,251	11,739	11,739	11,995	**11,995**
October	8,352	11,233	10,731	10,731	10,982	**10,982**
November	7,613	8,501	8,753	8,753	8,627	**8,627**
December	7,079	7,822		7,822	7,451	**7,451**
Annual				**116,973**	**109,047**	**109,047**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$677	$568	$746	$746	$657	**$ 657**
February	$599	$539	$663	$663	$601	**$ 601**
March	$620	$630	$689	$689	$660	**$ 660**
April	$683	$589	$753	$753	$671	**$ 671**
May	$723	$653	$911	$911	$782	**$ 782**
June	$790	$674	$978	$978	$826	**$ 826**
July	$808	$763	$1,160	$1,160	$961	**$ 961**
August	$810	$896	$1,156	$1,156	$1,026	**$ 1,026**
September	$757	$949	$1,060	$1,060	$1,004	**$ 1,004**
October	$773	$874	$978	$978	$926	**$ 926**
November	$731	$733	$816	$816	$774	**$ 774**
December	$632	$698		$698	$665	**$ 665**
Annual				**$10,605**	**$9,552**	**$ 9,552**

Site Name: South Maintenance Shop
Service Address: 8500 GRIFFIN RD DAVIE FL, 33328
Square Feet: 6,024

Electric History

Account: 703725325
Meter: KLL5443
Rate: GS-1
Baseline: Average of Last Two Years

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
	Consumption (kWh)					
January	3,208	4,739	3,854	3,854	4,297	**4,297**
February	2,767	3,760	2,881	2,881	3,321	**3,321**
March	2,912	4,117	3,075	3,075	3,596	**3,596**
April	3,515	5,007	3,670	3,670	4,339	**4,339**
May	4,082	4,426	3,828	3,828	4,127	**4,127**
June	4,432	4,750	4,583	4,583	4,667	**4,667**
July	4,907	5,664	4,440	4,440	5,052	**5,052**
August	5,012	5,222	4,400	4,400	4,811	**4,811**
September	4,972	5,081	4,714	4,714	4,898	**4,898**
October	4,908	4,588	4,027	4,027	4,308	**4,308**
November	5,753	3,631	4,488	4,488	4,060	**4,060**
December	4,856	4,106		4,106	4,481	**4,481**
Annual				**48,066**	**51,954**	**51,954**

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
	Dollars					
January	$344	$476	$388	$388	$432	**$ 432**
February	$298	$379	$293	$293	$336	**$ 336**
March	$314	$416	$322	$322	$369	**$ 369**
April	$378	$493	$383	$383	$438	**$ 438**
May	$424	$437	$399	$399	$418	**$ 418**
June	$461	$469	$476	$476	$472	**$ 472**
July	$509	$557	$461	$461	$509	**$ 509**
August	$520	$514	$457	$457	$486	**$ 486**
September	$513	$499	$489	$489	$494	**$ 494**
October	$507	$452	$419	$419	$435	**$ 435**
November	$593	$359	$466	$466	$412	**$ 412**
December	$502	$405		$405	$453	**$ 453**
Annual				**$4,957**	**$5,254**	**$ 5,254**

Account: **Account:** 8435159408
Meter: **Meter:** KLL54365436
Rate: **Rate:** GS-1
Baseline: **Baseline:** Average of last Two Years

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
	Consumption (kWh)					
January	2,022	1,866	548	548	1,207	**1,207**
February	1,746	912	539	539	726	**726**
March	1,692	691	549	549	620	**620**
April	1,232	1,676	585	585	1,131	**1,131**
May	1,590	1,892	568	568	1,230	**1,230**
June	2,083	1,372	978	978	1,175	**1,175**
July	2,123	1,810	734	734	1,272	**1,272**
August	2,065	1,758	875	875	1,317	**1,317**
September	1,781	985	779	779	882	**882**
October	1,626	570	861	861	716	**716**
November	1,722	524	1,171	1,171	848	**848**
December	1,466	720		720	1,093	**1,093**
Annual				**8,907**	**12,215**	**12,215**

Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
	Dollars					
January	$220	$192	$65	$65	$128	**$ 128**
February	$191	$98	$64	$64	$81	**$ 81**
March	$186	$76	$67	$67	$71	**$ 71**
April	$138	$171	$70	$70	$120	**$ 120**
May	$170	$192	$68	$68	$130	**$ 130**
June	$221	$141	$110	$110	$126	**$ 126**
July	$225	$184	$85	$85	$135	**$ 135**
August	$219	$179	$100	$100	$139	**$ 139**
September	$189	$104	$90	$90	$97	**$ 97**
October	$173	$63	$98	$98	$81	**$ 81**
November	$183	$59	$130	$130	$94	**$ 94**
December	$157	$78		$78	$118	**$ 118**
Annual				**$1,024**	**$1,320**	**$ 1,320**

Site Name: South Maintenance Shop
(Continued)

Account: 8851792385
Meter: ACD2572
Rate: GS-1
Baseline: Average of Last Two Years

	Consumption (kWh)							Total Consumption (kWh)					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected	Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	215	774	438	438	606	**606**	January	5,445	7,379	4,840	4,840	6,110	**6,110**
February	114	383	385	385	384	**384**	February	4,627	5,055	3,805	3,805	4,430	**4,430**
March	388	442	465	465	454	**454**	March	4,992	5,250	4,089	4,089	4,670	**4,670**
April	715	726	571	571	649	**649**	April	5,462	7,409	4,826	4,826	6,118	**6,118**
May	902	958	1,087	1,087	1,023	**1,023**	May	6,574	7,276	5,483	5,483	6,380	**6,380**
June	1,204	1,235	1,509	1,509	1,372	**1,372**	June	7,719	7,357	7,070	7,070	7,214	**7,214**
July	1,489	1,667	1,536	1,536	1,602	**1,602**	July	8,519	9,141	6,710	6,710	7,926	**7,926**
August	1,422	1,564	1,499	1,499	1,532	**1,532**	August	8,499	8,544	6,774	6,774	7,659	**7,659**
September	1,317	1,472	1,444	1,444	1,458	**1,458**	September	8,070	7,538	6,937	6,937	7,238	**7,238**
October	1,230	1,040	1,252	1,252	1,146	**1,146**	October	7,764	6,198	6,140	6,140	6,169	**6,169**
November	1,395	569	652	652	611	**611**	November	8,870	4,724	6,311	6,311	5,518	**5,518**
December	838	500		500	669	**669**	December	7,160	5,326		5,326	6,243	**6,243**
Annual				**11,338**	**11,503**	**11,503**	**Annual**				**68,311**	**75,671**	**75,671**

	Dollars							Total Dollars					
Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected	Month	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January	$31	$84	$54	$54	$69	**$ 69**	January	$594	$752	$507	$507	$630	**$ 630**
February	$20	$46	$49	$49	$47	**$ 47**	February	$508	$523	$405	$405	$464	**$ 464**
March	$49	$52	$58	$58	$55	**$ 55**	March	$549	$544	$447	$447	$495	**$ 495**
April	$83	$79	$69	$69	$74	**$ 74**	April	$599	$742	$522	$522	$632	**$ 632**
May	$100	$101	$121	$121	$111	**$ 111**	May	$695	$729	$588	$588	$659	**$ 659**
June	$131	$128	$164	$164	$146	**$ 146**	June	$812	$738	$749	$749	$744	**$ 744**
July	$160	$170	$167	$167	$168	**$ 168**	July	$894	$911	$713	$713	$812	**$ 812**
August	$153	$160	$163	$163	$161	**$ 161**	August	$892	$853	$719	$719	$786	**$ 786**
September	$142	$151	$157	$157	$154	**$ 154**	September	$844	$753	$736	$736	$744	**$ 744**
October	$133	$109	$138	$138	$123	**$ 123**	October	$813	$624	$655	$655	$639	**$ 639**
November	$150	$63	$77	$77	$70	**$ 70**	November	$926	$482	$672	$672	$577	**$ 577**
December	$93	$57		$57	$75	**$ 75**	December	$752	$540		$540	$646	**$ 646**
Annual				**$1,272**	**$1,254**	**$ 1,254**	**Annual**				**$7,253**	**$7,828**	**$ 7,828**

Site Name: MASS TRAN Northeast Terminal
Service Address: 304 HAMMONDVILLE RD POMPANO BEACH FL, 33060
Square Feet: 2,000

Electric History

Account: 4362132062
Meter: KU35890
Rate: GSD-1
Baseline: Average of Last Two Years

Month	Demand (kW)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		23	23	23	23	**23**
February		19	21	21	20	**20**
March		20	23	23	22	**22**
April		19	21	21	20	**20**
May		20	20	20	20	**20**
June		21	22	22	22	**22**
July		23	23	23	23	**23**
August		25	23	23	24	**24**
September		25	22	22	24	**24**
October		24	25	25	25	**25**
November		23	22	22	23	**23**
December	23	22		22	23	**23**
Annual				**267**	**266**	**266**

Month	Total Consumption (kWh)					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		10,320	10,200	10,200	10,260	**10,260**
February		7,980	8,340	8,340	8,160	**8,160**
March		8,340	8,460	8,460	8,400	**8,400**
April		9,360	9,420	9,420	9,390	**9,390**
May		8,100	8,640	8,640	8,370	**8,370**
June		9,240	9,060	9,060	9,150	**9,150**
July		10,920	10,200	10,200	10,560	**10,560**
August		9,720	9,180	9,180	9,450	**9,450**
September		11,400	9,720	9,720	10,560	**10,560**
October		10,020	8,580	8,580	9,300	**9,300**
November		8,940	8,340	8,340	8,640	**8,640**
December	9,360	8,760		8,760	9,060	**9,060**
Annual				**108,900**	**111,300**	**111,300**

Month	Dollars					
	2015	2016	2017	Most Recent 12 Months	Average of Last Two Years	Baseline Selected
January		$842	$863	$863	$853	**$ 853**
February		$670	$735	$735	$702	**$ 702**
March		$702	$786	$786	$744	**$ 744**
April		$721	$819	$819	$770	**$ 770**
May		$667	$762	$762	$715	**$ 715**
June		$738	$810	$810	$774	**$ 774**
July		$848	$888	$888	$868	**$ 868**
August		$808	$829	$829	$818	**$ 818**
September		$893	$849	$849	$871	**$ 871**
October		$811	$816	$816	$814	**$ 814**
November		$744	$768	$768	$756	**$ 756**
December	$819	$723		$723	$771	**$ 771**
Annual				**$9,649**	**$9,455**	**$ 9,455**

BP03-Easterlin Park

Account #:	5066052002				
Acct Name:	Easterlin Park				
Site Address:	100 NW 38th St., Oakland Park, FL 33309 - (10th and 38th)				
Water Utility:	City of Oakland Park				
Meter #					
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
9/28/2017	82	$766.89	82	$718.92	$1,485.81
8/28/2017	143	$1,158.00	143	$1,041.00	$2,199.00
7/27/2017	133	$1,093.80	133	$988.20	$2,082.00
6/26/2017	121	$1,061.88	121	$924.84	$1,986.72
5/26/2017	163	$1,286.10	163	$1,146.60	$2,432.70
4/26/2017	109	$939.96	109	$861.48	$1,801.44
3/28/2017	96	$866.63	96	$792.84	$1,659.47
2/27/2017	75	$722.02	75	$681.96	$1,403.98
1/27/2017	162	$1,279.69	162	$1,141.32	$2,421.01
12/28/2016	51	$568.18	51	$555.24	$1,123.42
11/28/2016	32	$446.39	32	$454.92	$901.31
10/26/2016	45	$529.72	45	$523.56	$1,053.28
9/26/2016	75	$702.79	75	$670.89	$1,373.68
8/26/2016	45	$517.99	45	$516.69	$1,034.68
7/27/2016	27	$407.11	27	$424.17	$831.28
6/28/2016	135	$1,021.39	135	$1,021.39	$2,042.78
5/26/2016	11	$308.55	11	$341.93	$650.48
4/27/2016	17	$345.51	17	$373.77	$719.28
3/28/2016	21	$370.15	21	$393.33	$763.48
2/29/2016	15	$339.18	15	$362.49	$701.67
1/27/2016	16	$339.35	16	$367.63	$706.98
12/28/2015	18	$351.67	18	$377.91	$729.58
11/24/2015	14	$327.03	14	$357.34	$684.37
10/26/2015	18	$351.67	18	$377.91	$729.58

City of Oakland Park rates effective 10/1/17

$6.68 per kgal, volume cost of water
$5.34 per kgal, volume cost of sewer
$12.02 per kgal, total

BP05-Long Key Nature Center

Account #:	380891				
Acct Name:	Broward County Parks and Rec. Division				
Site Address:	2501 SW 130th Ave., Davie, FL 33330				
Water Utility:	City of Sunrise				
Meter #	203948				
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
9/21/2017	4	$63.29	4	$76.04	$139.33
8/11/2017	2	$53.19	2	$66.32	$119.51
7/19/2017	1	$48.14	1	$61.46	$109.60
6/21/2017	2	$53.19	2	$66.32	$119.51
5/18/2017	2	$53.19	2	$66.32	$119.51
4/19/2017	3	$58.24	3	$71.18	$129.42
3/20/2017	2	$68.34	2	$80.90	$149.24
2/22/2017	2	$68.34	2	$80.90	$149.24
1/20/2017	7	$78.44	7	$90.62	$169.06
12/15/2016	2	$53.19	2	$66.32	$119.51
11/16/2016	2	$53.19	2	$66.32	$119.51
10/21/2016	5	$68.34	5	$80.90	$149.24
9/20/2016	3	$56.03	3	$68.31	$124.34
8/17/2016	3	$56.03	3	$68.31	$124.34
7/15/2016	2	$51.20	2	$63.67	$114.87
6/15/2016	3	$56.03	3	$68.31	$124.34
5/13/2016	1	$46.37	1	$59.03	$105.40
4/14/2016	2	$51.20	2	$63.67	$114.87
3/15/2016	2	$51.20	2	$63.67	$114.87
2/16/2016	1	$46.37	1	$59.03	$105.40
1/19/2016	2	$51.20	2	$63.67	$114.87
12/17/2015	1	$46.37	1	$59.03	$105.40
11/16/2015	2	$51.20	2	$54.39	$105.59
10/19/2015	0	$41.54	0	$54.39	$95.93

City of Sunrise rates effective 10/1/17

$4.18 per kgal, volume cost of water
$4.03 per kgal, volume cost of sewer
$8.21 per kgal, total

BP04-TREE TOPS PARK

Account #:	50598		50600		50602		50604		50606		50608		TOTALS	
Acct Name:	Guard House		Canoe Rentals		Playground		Administration		Welcome Center		Maintenance			
Site Address:	3900 SW 100 AVE		3900 SW 100 AVE		3900 SW 100 AVE		3900 SW 100 AVE		3900 SW 100 AVE		3900 SW 100 AVE			
Water Utility:	Davie		Davie		Davie		Davie		Davie		Davie			
Meter #	783968		809883		963294		60404183		7021332		786175			
Read Date	W&S Cons. (kGal)	Total Bill Amount ($)	W&S Cons. (kGal)	Total Bill Amount ($)	W&S Cons. (kGal)	Total Bill Amount ($)	W&S Cons. (kGal)	Total Bill Amount ($)	W&S Cons. (kGal)	Total Bill Amount ($)	W&S Cons. (kGal)	Total Bill Amount ($)	W&S Cons. (kGal)	Total Bill Amount ($)
1/10/2018	0	$146.64	0	$469.22	2	$494.38	6	$544.70	5	$532.12	3	$506.96	16	$2,694.02
12/6/2017	0	$146.64	0	$469.22	3	$506.96	9	$582.44	9	$582.44	5	$532.12	26	$2,819.82
11/1/2017	0	$146.20	0	$467.82	2	$492.90	5	$530.53	4	$3,517.99	5	$530.53	16	$5,685.97
10/4/2017	0	$142.65	0	$456.44	6	$529.88	2	$480.92	2	$480.92	3	$493.16	13	$2,583.97
9/6/2017	0	$142.65	0	$456.44	9	$566.60	16	$652.28	5	$517.64	6	$529.88	36	$2,865.49
8/9/2017	0	$142.65	0	$456.44	10	$578.84	14	$627.80	3	$493.16	3	$493.16	30	$2,792.05
7/5/2017	0	$142.65	0	$456.44	12	$603.32	15	$640.04	6	$529.88	0	$456.44	33	$2,828.77
6/7/2017	0	$142.65	0	$456.44	14	$503.29	8	$554.36	7	$542.12	0	$456.44	29	$2,655.30
5/3/2017	0	$142.65	0	$456.44	13	$615.56	8	$554.36	5	$517.64	0	$456.44	26	$2,743.09
4/5/2017	0	$5,717.04	0	$18,062.07	17	$20,310.90	11	$22,134.75	5	$19,294.55	0	$19,675.38	33	$105,194.69
3/8/2017	0	$142.65	1	$468.68	12	$603.32	9	$566.60	6	$529.88	3	$574.70	31	$2,885.83
2/1/2017	0	$104.61	0	$333.80	7	$420.40	5	$395.92	3	$371.44	3	$371.44	18	$1,997.61
1/4/2017	0	$175.94	0	$562.94	8	$660.86	7	$648.62	1	$575.18	5	$624.14	21	$3,247.68
11/30/2016	0	$142.65	1	$468.68	7	$542.12	8	$554.36	0	$163.53	4	$505.40	20	$2,376.74
11/2/2016	0	$51.05	1	$168.98	5	$191.51	5	$191.51	0	$163.35	4	$185.89	15	$952.29
10/5/2016	1	$55.96	0	$161.27	6	$194.63	9	$211.31	0	$161.27	5	$189.07	21	$973.51
9/7/2016	0	$50.40	0	$161.27	4	$183.51	13	$233.55	0	$161.27	4	$183.51	21	$973.51
8/3/2016	0	$50.40	0	$161.27	5	$189.07	16	$250.23	0	$161.27	4	$183.51	25	$995.75
7/6/2016	0	$50.40	1	$166.83	4	$183.51	15	$244.67	0	$161.27	5	$189.07	25	$995.75
6/8/2016	0	$50.40	0	$161.27	0	$161.27	9	$211.31	4	$0.00	4	$183.51	17	$767.76
5/4/2016	0	$50.40	0	$161.27	0	$161.27	11	$222.43	2	$172.39	5	$189.07	18	$956.83
4/6/2016	0	$50.40	0	$161.27	0	$161.27	19	$266.91	4	$183.51	5	$189.07	28	$1,012.43
3/9/2016	0	$50.40	1	$166.83	2	$172.39	11	$222.43	1	$166.83	5	$189.07	20	$967.95
2/3/2016	0	$50.40	0	$161.27	2	$172.39	7	$200.19	0	$161.27	12	$227.99	21	$973.51

Note: Sewer charges added beginning Nov-16; catchup billing for previous unbilled sewer in Apr-17

Town of Davie rates effective 10/1/16

$5.64	per kgal, volume cost of water
$6.60	per kgal, volume cost of sewer
$12.24	per kgal, total

BP11-Hollywood North Beach Park (BB) **Hollywood North Park Beach (BBB)**

Account #:	151397-217532					151399-217534				
Acct Name:	South Broward Park District					South Broward Park District				
Site Address:	3601 N. Ocean Dr., Hollywood, FL 33330					3601 N. Ocean Dr., Hollywood, FL 33330				
Water Utility:	City of Hollywood					City of Hollywood				
Meter #	60224621 (Sheridan & A1A BB)					80202997 (Sheridan & A1A BBB)				
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
9/17/2017	27	$207.29	27	$289.77	$497.06	2	$21.22	2	$27.93	$49.15
8/18/2017	48	$342.50	48	$490.17	$832.67	1	$16.40	1	$20.78	$37.18
7/19/2017	52	$366.35	52	$525.72	$892.07	1	$16.40	1	$20.78	$37.18
6/19/2017	40	$294.05	40	$418.47	$712.52	4	$30.86	4	$42.23	$73.09
5/20/2017	42	$303.69	42	$440.17	$743.86	7	$50.14	7	$70.83	$120.97
4/20/2017	55	$309.45	55	$561.47	$870.92	1	$16.40	1	$20.78	$37.18
3/21/2017	268	$1,759.33	268	$889.41	$2,648.74	0.7	$11.58	0.7	$13.63	$25.21
2/19/2017	55	$390.45	55	$561.47	$951.92	0.7	$11.58	0.7	$13.63	$25.21
1/20/2017	49	$347.07	49	$517.12	$864.19	0.7	$11.58	0.7	$13.63	$25.21
12/21/2016	28	$216.93	28	$304.07	$521.00	0.7	$11.58	0.7	$13.63	$25.21
11/21/2016	29	$221.75	29	$311.22	$532.97	0.7	$11.58	0.7	$13.63	$25.21
10/22/2016	24	$188.01	24	$261.17	$449.18	0.7	$11.58	0.7	$13.63	$25.21
9/22/2016	28	$216.93	28	$304.07	$521.00	0.7	$11.58	0.7	$13.63	$25.21
8/23/2016	39	$284.41	39	$404.17	$688.58	0.7	$11.58	0.7	$13.63	$25.21
7/24/2016	56	$385.27	56	$570.62	$955.89	0.7	$11.58	0.7	$13.63	$25.21
6/24/2016	48	$342.25	48	$489.97	$832.22	0.7	$11.58	0.7	$13.63	$25.21
5/25/2016	44	$318.15	44	$454.22	$772.37	0.7	$11.58	0.7	$13.63	$25.21
4/25/2016	67	$462.75	67	$868.72	$1,331.47	0.7	$11.58	0.7	$13.63	$25.21
3/26/2016	74	$510.95	74	$830.23	$1,341.18	0.7	$11.58	0.7	$13.63	$25.21
2/25/2016	54	$380.81	54	$547.17	$927.98	0.7	$11.58	0.7	$13.63	$25.21
1/26/2016	49	$351.89	49	$504.27	$856.16	0	$6.76	0	$6.48	$13.24
12/27/2015	31	$231.59	31	$325.52	$557.11	0.7	$11.58	0.7	$13.63	$25.21
11/27/2015	25	$197.65	25	$275.47	$473.12	0.7	$11.58	0.7	$13.63	$25.21
10/28/2015	30	$226.57	30	$318.37	$544.94	0.7	$11.58	0.7	$13.63	$25.21

City of Hollywood rates effective 11/1/13

$6.43 per kgal, volume cost of water (Block 1)

$9.53 per kgal, volume cost of sewer

$15.96 per kgal, total

BL22-Margate Catherine Young Library

Customer#	29161				
Acct Name:	Catherine Young Library				
Site Address:	5810 Park Dr., Margate, FL				
Water Utility:	City of Margate				
Location	226414				
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
9/20/2017	42	$329.15	42	$421.54	$750.69
8/21/2017	49	$361.55	49	$461.59	$823.14
7/20/2017	52	$369.03	52	$470.31	$839.34
7/20/2017	46	$348.59	46	$445.57	$794.16
6/20/2017	53	$376.67	53	$480.28	$856.95
5/18/2017	37	$307.55	37	$394.84	$702.39
4/19/2017	24	$251.39	24	$251.39	$502.78
3/20/2017	42	$329.15	42	$329.15	$658.30
2/21/2017	47	$352.91	47	$450.91	$803.82
1/19/2017	38	$311.87	38	$400.18	$712.05
12/20/2016	46	$348.59	46	$447.57	$796.16
11/21/2016	58	$400.43	58	$509.65	$910.08
10/20/2016	60	$320.40	60	$520.33	$840.73
9/20/2016	55	$379.68	55	$483.46	$863.14
8/18/2016	62	$409.50	62	$520.28	$929.78
6/20/2016	64	$420.15	64	$533.43	$953.58
5/19/2016	47	$347.73	47	$444.01	$791.74
4/20/2016	56	$383.94	56	$488.72	$872.66
3/21/2016	51	$365.62	51	$466.10	$831.72
2/18/2016	65	$424.84	65	$539.22	$964.06
1/20/2016	69	$440.17	69	$558.15	$998.32
12/21/2015	53	$373.29	53	$475.57	$848.86
11/19/2015	73	$458.92	73	$581.33	$1,040.25
10/21/2015	58	$394.59	58	$501.87	$896.46

City of Margate rates

$4.41 per kgal, volume cost of water

$5.45 per kgal, volume cost of sewer

$9.86 per kgal, total

BL23-Hallandale Library

Account #:	838708				
Acct Name:	Hallandale Library				
Site Address:	300 S. Federal Hwy., Hallandale Beach, FL 33009				
Water Utility:	City of Hallandale Beach				
Meter #					
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
9/29/2017	9	$30.22	9	$50.14	$80.36
8/29/2017	13	$39.16	13	$67.65	$106.81
7/31/2017	12	$36.69	12	$63.08	$99.77
6/29/2017	11	$33.54	11	$57.25	$90.79
5/30/2017	13	$37.14	13	$63.91	$101.05
4/28/2017	13	$38.94	13	$67.24	$106.18
3/29/2017	13	$37.59	13	$64.74	$102.33
2/28/2017	15	$42.99	15	$74.73	$117.72
1/30/2017	13	$37.59	13	$64.74	$102.33
12/30/2016	11	$34.44	11	$58.92	$93.36
11/30/2016	13	$37.81	13	$65.16	$102.97
10/31/2016	13	$38.26	13	$65.99	$104.25
9/30/2016	14	$40.06	14	$69.32	$109.38
8/30/2016	12	$36.24	12	$62.25	$98.49
7/29/2016	10	$32.19	10	$54.76	$86.95
6/30/2016	10	$31.96	10	$54.34	$86.30
5/30/2016	10	$31.22	10	$52.76	$83.98
4/29/2016	10	$30.80	10	$51.64	$82.44
3/30/2016	9	$30.37	9	$50.51	$80.88
2/29/2016	11	$33.54	11	$57.25	$90.79
1/29/2016	9	$29.08	9	$49.76	$78.84
12/30/2015	12	$35.79	12	$61.41	$97.20
11/28/2015	12	$36.69	12	$63.08	$99.77
10/31/2015	55	$138.52	55	$247.17	$385.69

BL24-Century Plaza Library

Account #:	174971				
Acct Name:	Century Plaza Library - Century Plaza Assoc.				
Site Address:	1856 W Hillsboro Blvd - A				
Water Utility:	City of Deerfield Beach				
Meter #	154105				
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
12/21/2017	1	$18.67	1	$13.69	$32.36
11/21/2017	1	$18.67	1	$13.69	$32.36
10/24/2017	1	$18.67	1	$13.69	$32.36
9/26/2017	2	$22.34	2	$16.40	$38.74
8/24/2017	1	$18.67	1	$13.69	$32.36
7/24/2017	4	$29.68	4	$16.40	$46.08
6/23/2017	2	$22.34	2	$16.40	$38.74
5/23/2017	2	$22.34	2	$16.40	$38.74
4/24/2017	1	$18.67	1	$13.69	$32.36
3/23/2017	1	$18.67	1	$13.69	$32.36
2/23/2017	1	$18.67	1	$13.69	$32.36
1/24/2017	1	$18.67	1	$13.69	$32.36
12/20/2016	1	$18.67	1	$13.69	$32.36
11/21/2016	26	$115.46	26	$81.44	$196.90
10/24/2016	47	$200.09	47	$138.35	$338.44
9/26/2016	4	$171.88	4	$119.38	$291.26
8/25/2016	22	$99.34	22	$70.60	$169.94
7/25/2016	4	$29.68	4	$21.82	$51.50
6/23/2016	1	$18.67	1	$13.69	$32.36
5/23/2016	1	$18.67	1	$13.69	$32.36
4/25/2016	2	$22.34	2	$16.40	$38.74
1/25/2016	1	$18.67	1	$13.69	$32.36
12/22/2015	1	$18.67	1	$13.69	$32.36
11/19/2015	1	$18.67	1	$13.69	$32.36

BL26-Carver Ranches Library

Account #:	3013138				
Acct Name:	Carver Ranches Library				
Site Address:	4733 SW 18th St, Hollywood				
Water Utility:	Broward County WWS				
Meter #	63427734				
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
3/20/2017	8	$78.97	8	$97.77	$176.74
2/16/2017	7	$71.40	7	$93.91	$165.31
1/19/2017	8	$78.97	8	$97.77	$176.74
12/16/2016	8	$78.97	8	$97.77	$176.74
11/17/2016	9	$86.54	9	$101.63	$188.17
10/18/2016	7	$70.61	7	$93.55	$164.16
9/19/2016	9	$84.10	9	$100.44	$184.54
8/16/2016	8	$76.65	8	$96.70	$173.35
7/19/2016	9	$84.10	9	$100.44	$184.54
6/16/2016	10	$91.35	10	$104.18	$195.53
5/17/2016	10	$91.35	10	$104.18	$195.53
4/18/2016	11	$98.70	11	$107.92	$206.62
3/16/2016	8	$76.65	8	$96.70	$173.35
2/17/2016	9	$84.10	9	$100.44	$184.54
1/19/2016	9	$84.10	9	$100.44	$184.54
12/16/2015	8	$76.65	8	$96.70	$173.35
11/17/2015	8	$76.65	8	$96.70	$173.35
10/15/2015	9	$81.64	9	$99.47	$181.11
9/18/2015	10	$85.12	10	$101.59	$186.71
8/18/2015	8	$70.70	8	$94.27	$164.97
7/20/2015	9	$77.91	9	$97.93	$175.84
6/17/2015	8	$70.70	8	$94.27	$164.97
5/18/2015	9	$77.91	9	$97.93	$175.84
4/17/2015	8	$70.70	8	$94.27	$164.97

Broward County Water & Wastewater Services rates effective 10/1/17

$4.90 per kgal, volume cost of water

$3.98 per kgal, volume cost of sewer

$8.88 per kgal, total

BO28-Public Safety Complex (Broward Co Board) **Public Safety Complex (Broward Cty S/C)** **BO29-North Regional Courthouse**

Account #:	2041788					2042312					Account #:	4070				
Acct Name:	Public Safety Complex - Broward Cty Board					Public Safety Complex - Broward Cty Public S/C					Acct Name:	North Regional Courthouse				
Site Address:	2601 West Broward Blvd, Ft. Lauderdale, FL 33312					2601 West Broward Blvd, Ft. Lauderdale, FL 33312					Site Address:	1600 W Hillsboro Blvd., Deerfield Beach, FL 33309				
Water Utility:	City of Ft. Lauderdale					City of Ft. Lauderdale					Water Utility:	City of Deerfield Beach				
Meter #	(Broward Cty. Board)					(Broward Cty Public S/C)					Meter #					
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)	Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
11/20/2017	15	$152.50	15	$221.76	$374.26	1,078	$3,272.76	1,078	$4,951.83	$8,224.59	10/13/2015	201	$1,187.72	201	$874.19	$2,061.91
10/23/2017	13	$137.67	13	$201.21	$338.88	1,318	$4,259.63	1,318	$5,897.46	$10,157.09	11/12/2015	139	$706.17	139	$960.18	$1,666.35
9/21/2017	13	$133.22	13	$194.77	$327.99	1,678	$5,201.04	1,678	$7,195.72	$12,396.76	12/10/2015	114	$868.43	114	$638.42	$1,506.85
8/22/2017	13	$133.22	13	$194.77	$327.99	1,176	$3,695.51	1,176	$5,123.56	$8,819.07	1/11/2016	92	$787.69	92	$578.80	$1,366.49
7/21/2017	12	$127.22	12	$186.52	$313.74	1,202	$3,773.49	1,202	$5,230.89	$9,004.38	2/11/2016	111	$857.42	111	$630.29	$1,487.71
6/22/2017	27	$217.19	27	$310.35	$527.54	1,206	$3,785.48	1,206	$5,247.40	$9,032.88	3/10/2016	122	$897.79	122	$660.10	$1,557.89
5/22/2017	13	$133.22	13	$194.77	$327.99	1,154	$3,629.53	1,154	$5,032.75	$8,662.28	4/11/2016	151	$1,004.22	151	$738.69	$1,742.91
4/20/2017	14	$139.21	14	$203.03	$342.24	944	$2,999.73	944	$4,165.91	$7,165.64	5/11/2016	166	$1,059.27	166	$779.34	$1,838.61
3/22/2017	22	$187.20	22	$269.07	$456.27	928	$2,951.75	928	$4,099.87	$7,051.62	6/13/2016	207	$1,209.74	207	$890.45	$2,100.19
2/20/2017	18	$163.21	18	$236.05	$399.26	830	$2,657.84	830	$3,695.34	$6,353.18	7/12/2016	863	$3,819.94	863	$2,668.21	$6,488.15
1/23/2017	35	$265.17	35	$376.40	$641.57	842	$2,693.83	842	$3,744.88	$6,438.71	8/11/2016	213	$1,231.76	213	$906.71	$2,138.47
12/21/2016	30	$235.18	30	$335.12	$570.30	1,010	$3,197.67	1,010	$4,438.35	$7,636.02	9/12/2016	234	$1,308.83	234	$963.62	$2,272.45
11/18/2016	9	$101.85	9	$150.09	$251.94	888	$2,831.79	888	$3,934.76	$6,766.55	10/12/2016	206	$1,206.07	206	$887.74	$2,093.81
10/24/2016	13	$131.31	13	$192.00	$323.31	1,056	$3,287.49	1,056	$4,562.02	$7,849.51	11/14/2016	188	$1,059.27	188	$779.34	$1,838.61
9/22/2016	16	$143.97	16	$209.08	$353.05	1,224	$3,654.75	1,224	$5,067.93	$8,722.68	1/11/2017	159	$1,033.58	159	$760.37	$1,793.95
8/22/2016	21	$172.52	21	$248.39	$420.91	1,208	$3,609.08	1,208	$5,005.04	$8,614.12	2/16/2017	138	$956.51	138	$703.46	$1,659.97
7/21/2016	14	$132.55	14	$193.36	$325.91	1,330	$3,957.35	1,330	$5,484.61	$9,441.96	3/15/2017	158	$1,029.91	158	$757.66	$1,787.57
6/21/2016	12	$121.13	12	$177.63	$298.76	728	$2,338.82	728	$3,118.18	$5,457.00	4/13/2017	178	$1,101.31	178	$811.86	$1,913.17
5/19/2016	21	$172.52	21	$248.39	$420.91	1,526	$4,516.87	1,526	$6,255.08	$10,771.95	5/10/2017	152	$1,007.89	152	$741.40	$1,749.29
4/21/2016	15	$138.26	15	$201.22	$339.48	1,042	$3,135.20	1,042	$4,352.50	$7,487.70	6/13/2017	199	$1,180.38	199	$868.77	$2,049.15
3/22/2016	17	$149.68	17	$216.94	$366.62	1,022	$3,078.10	1,022	$4,273.88	$7,351.98	7/13/2017	198	$1,176.71	198	$866.06	$2,042.77
2/19/2016	12	$121.13	12	$177.63	$298.76	760	$2,330.17	760	$3,243.97	$5,574.14	8/10/2017	216	$1,242.77	216	$914.84	$2,157.61
1/22/2016	35	$252.45	35	$358.46	$610.91	944	$2,855.44	944	$3,967.27	$6,822.71	9/14/2017	287	$1,503.34	287	$1,107.25	$2,610.59
12/22/2015	16	$143.97	16	$209.08	$353.05	1,270	$3,786.07	1,270	$5,248.76	$9,034.83	10/11/2017	139	$960.18	139	$706.17	$1,666.35

City of Fort Lauderdale rates effective 10/1/17

$5.04 per kgal, volume cost of water

$6.93 per kgal, volume cost of sewer

$11.97 per kgal, total

BO30-Govt. Center West Bldg #1 | **Govt. Center West Bldg. #2** | **Govt. Center West - Bank Drive-In**

Account #:	27112-07					86101-07					62100-00				
Acct Name:	Broward County Commission					Browward County Commission					Broward County Commission				
Site Address:	1 N. University Dr., Bldg. #1, Plantation, Fl 33317					1 N. University Dr., Bldg #2, Plantation, FL 33317					1 N. University Dr., Plantation, FL 33317 (Bank Drive-In)				
Water Utility:	City of Plantation					City of Plantation					City of Plantation				
Meter #															
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
9/21/2017	309	$1,926.26	309	$1,538.03	$3,464.29	30	$145.16	30	$254.60	$399.76	0.1	$13.10	0.1	$18.94	$32.04
8/21/2017	309	$1,929.94	309	$1,539.87	$3,469.81	33	$149.67	33	$275.65	$425.32	0.1	$13.10	0.1	$18.94	$32.04
7/21/2017	332	$2,138.55	332	$1,639.52	$3,778.07	35	$150.07	35	$274.44	$424.51	0.1	$13.10	0.1	$18.94	$32.04
6/20/2017	252	$1,403.35	252	$1,275.72	$2,679.07	32	148..1	32	$261.98	$261.98	0.1	$13.10	0.1	$18.94	$32.04
5/18/2017	221	$1,158.49	221	$1,135.57	$2,294.06	35	$154.73	35	$278.57	$433.30	0.4	$13.68	0.4	$20.32	$34.00
4/17/2017	189	$917.31	189	$985.36	$1,902.67	33	$150.86	33	$268.89	$419.75	0.5	$13.81	0.5	$22.18	$35.99
3/17/2017	189	$919.51	189	$985.75	$1,905.26	32	$148.10	32	$261.98	$410.08	0.1	1`3.1	0.1	$18.94	$18.94
2/16/2017	174	$807.79	174	$915.68	$1,723.47	37	$158.41	37	$287.77	$446.18	0.2	$13.31	0.2	$19.40	$32.71
1/18/2017	186	$898.19	186	$972.38	$1,870.57	45	$172.94	45	$324.19	$497.13	0.3	$14.32	0.3	$19.84	$34.16
12/14/2016	142	$609.57	142	$970.90	$1,580.47	33	$149.76	33	$226.10	$375.86	0	$12.94	0	$18.48	$31.42
11/18/2016	240	$1,294.36	240	$1,220.86	$2,515.22	48	$147.17	48	$334.82	$481.99	3	$18.09	3	$29.39	$47.48
10/18/2016	291	$1,780.90	291	$1,455.51	$3,236.41	40	$181.41	40	$279.48	$460.89	0.2	$17.17	0.2	$17.74	$34.91
9/19/2016	302	$1,797.19	302	$1,410.74	$3,207.93	45	$164.90	45	$299.62	$464.52	3.3	$18.25	3.3	$29.82	$48.07
8/18/2016	291	$1,700.84	291	$1,363.76	$3,064.60	42	$160.83	42	$289.71	$450.54	0	$12.44	0	$15.40	$27.84
7/19/2016	276	$1,564.70	276	$1,297.39	$2,862.09	45	$164.90	45	$299.62	$464.52	0	$12.44	0	$15.40	$27.84
6/20/2016	277	$1,573.54	277	$1,301.70	$2,875.24	40	$156.78	40	$279.80	$436.58	0	$12.44	0	$15.40	$27.84
5/19/2016	251	$1,344.58	251	$1,190.07	$2,534.65	47	$165.85	47	$304.37	$470.22	0	$12.44	0	$15.40	$27.84
4/19/2016	265	$1,464.81	265	$1,248.69	$2,713.50	46	$165.50	46	$303.60	$469.10	0.1	$12.97	0.1	$15.83	$28.80
3/18/2016	168	$736.71	168	$831.48	$1,568.19	43	$161.72	43	$291.87	$453.59	0.3	$12.97	0.3	$16.89	$29.86
2/19/2016	142	$584.75	142	$719.42	$1,304.17	48	$170.39	48	$312.99	$483.38	0.2	$12.79	0.2	$16.26	$29.05
1/19/2016	295	$1,730.89	295	$1,378.42	$3,109.31	38	$152.52	38	$208.46	$360.98	0	$12.44	0	$15.40	$27.84
12/17/2015	162	$695.00	162	$806.05	$1,501.05	35	$148.09	35	$268.68	$416.77	0.1	$12.62	0.1	$15.83	$28.45
11/19/2015	224	$1,132.63	224	$1,072.84	$2,205.47	44	$163.67	44	$296.61	$460.28	0.1	$12.62	0.1	$15.83	$28.45
10/19/2015	226	$1,147.48	226	$1,081.89	$2,229.37	40	$156.69	40	$279.37	$436.06	1	$14.21	1	$19.71	$33.92

City of Plantation rates effective 10/1/17

$5.74 per kgal, volume cost of water (multiple-tiered based on flow)

$4.93 per kgal, volume cost of sewer

$10.67 per kgal, total

BO31-Traffic Engineeering Administration North | **Broward Co Traffic Eng Irrigation**

Account #:	2060097					2060098				
Acct Name:	Broward Cty Traffic Eng					Broward Traffic Eng (Broward Co Comm Irrigation Meter)				
Site Address:	2300 W. Commercial Blvd, Ft. Lauderdale, FL 33309					2300 W. Commercial Blvd, Ft. Lauderdale, FL 33309				
Water Utility:	City of Ft. Lauderdale					City of Ft. Lauderdale				
Meter #	(Broward Cty Traffic Eng Meter)					(Broward Co Comm Irrigation Meter)				
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
11/29/2017	25	$267.65	25	$399.44	$667.09	0	$46.40	0		$46.40
10/30/2017	27	$276.41	27	$411.33	$687.74	0	$46.18	0		$46.18
9/28/2017	25	$254.90	25	$380.42	$635.32	31	$224.30	0		$224.30
8/29/2017	32	$288.50	32	$426.62	$715.12	104	$664.67	0		$664.67
7/28/2017	31	$283.70	31	$420.02	$703.72	35	$247.54	0		$247.54
6/29/2017	33	$293.30	33	$433.22	$726.52	44	$299.83	0		$299.83
5/30/2017	37	$312.50	37	$459.62	$772.12	46	$311.45	0		$311.45
4/27/2017	70	$490.70	70	$677.42	$1,168.12	43	$294.02	0		$294.02
3/29/2017	35	$302.90	35	$446.42	$749.32	47	$317.26	0		$317.26
2/27/2017	35	$302.90	35	$446.42	$749.32	53	$352.12	0		$352.12
1/30/2017	31	$283.70	31	$420.02	$703.72	46	$311.45	0		$311.45
12/29/2016	43	$341.30	43	$499.22	$840.52	59	$386.98	0		$386.98
11/29/2016	26	$258.84	26	$385.76	$644.60	39	$264.89	0		$264.89
10/28/2016	26	$258.84	26	$385.76	$644.60	51	$339.36	0		$339.36
9/29/2016	28	$256.44	28	$381.28	$637.72	47	$302.00	0		$302.00
8/29/2016	28	$256.44	28	$381.28	$637.72	53	$335.18	0		$335.18
7/28/2016	29	$261.01	29	$387.57	$648.58	47	$302.00	0		$302.00
6/28/2016	32	$274.72	32	$406.44	$681.16	50	$318.59	0		$318.59
5/26/2016	28	$256.44	28	$381.28	$637.72	40	$263.29	0		$263.29
4/28/2016	32	$274.72	32	$406.44	$681.16	45	$290.94	0		$290.94
3/29/2016	35	$288.43	35	$425.31	$713.74	42	$274.35	0		$274.35
2/26/2016	31	$270.15	31	$400.15	$670.30	38	$252.23	0		$252.23
1/29/2016	32	$274.72	32	$406.44	$681.16	72	$440.25	0		$440.25
12/30/2015	31	$270.15	31	$400.15	$670.30	86	$517.67	0		$517.67

City of Fort Lauderdale rates effective 10/1/17

$5.04	per kgal, volume cost of water
$6.93	per kgal, volume cost of sewer
$11.97	per kgal, total

BO32Park Admin Complex

Account #:	5066055001				
Acct Name:	6224 Broward County - District Maintenance Utilities				
Site Address:	950 NW 38th Street, Pompano Beach, FL				
Water Utility:	City of Oakland Park				
Meter #					
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bill Amount ($)
9/28/2017	31	$275.11	31	$253.04	$528.15
8/28/2017	54	$421.54	54	$374.48	$796.02
7/27/2017	52	$408.72	52	$363.92	$772.64
6/26/2017	45	$363.85	45	$326.96	$690.81
5/26/2017	46	$370.26	46	$332.24	$702.50
4/26/2017	57	$404.77	57	$390.32	$795.09
3/28/2017	51	$402.31	51	$358.64	$760.95
2/27/2017	44	$357.44	44	$321.68	$679.12
1/27/2017	57	$440.77	57	$390.32	$831.09
12/28/2016	85	$620.35	85	$390.32	$1,010.67
11/28/2016	40	$261.80	40	$300.56	$562.36
10/26/2016	50	$395.90	50	$353.36	$749.26

City of Oakland Park rates effective 10/1/17

$6.68	per kgal, volume cost of water
$5.34	per kgal, volume cost of sewer
$12.02	per kgal, total

BH40-EAP Our House

Account #:	2014815				
Acct Name:	Broward Co FL EAP Our House				
Site Address:	408 NE 4th Street, Ft. Lauderdale, FL 33301				
Water Utility:	City of Ft. Lauderdale				
Meter #	(5/8" meter)				
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bil Amount ($)
1/8/2016	2	$15.67	2	$22.16	$37.83
11/7/2017	0	$7.20	0	$10.56	$17.76
10/10/2017	1	$11.83	1	$16.89	$28.72
9/12/2017	0	$6.86	0	$10.06	$16.92
8/9/2017	1	$11.66	1	$16.66	$28.32
7/10/2017	0	$6.86	0	$10.06	$16.92
6/9/2017	18	$93.26	18	$128.86	$222.12
5/10/2017	1	$11.66	1	$16.66	$28.32
4/7/2017	0	$6.86	0	$10.06	$16.92
3/9/2017	1	$11.66	1	$16.66	$28.32
2/7/2017	0	$6.86	0	$10.06	$16.92
1/11/2017	1	$11.66	1	$16.66	$28.32
12/8/2016	1	$11.66	1	$16.66	$28.32
11/7/2016	1	$10.29	1	$14.65	$24.94
10/12/2016	0	$6.64	0	$9.74	$16.38
9/9/2016	1	$11.10	1	$15.87	$26.97
8/9/2016	1	$11.10	1	$15.87	$26.97
7/8/2016	1	$11.10	1	$15.87	$26.97
6/8/2016	0	$6.53	0	$9.58	$16.11
5/6/2016	1	$11.10	1	$15.87	$26.97
4/8/2016	1	$11.10	1	$15.87	$26.97
3/6/2016	1	$11.10	1	$15.87	$26.97
2/9/2016	1	$11.10	1	$15.87	$26.97
12/10/2015	1	$11.10	1	$15.87	$26.97

City of Fort Lauderdale rates effective 10/1/17

$5.04	per kgal, volume cost of water
$6.93	per kgal, volume cost of sewer
$11.97	per kgal, total

BH35-Booher Building

Account #:	26812				
Acct Name:	Broward County Barc/Unit #60174				
Site Address:	3275 NW 99 Way, Coral Springs, FL 33065				
Water Utility:	City of Coral Springs				
Meter #	N70007606				
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bil Amount ($)
10/4/2017	162	$645.79	162	$976.72	$1,622.51
9/5/2017	284	$975.19	284	$1,475.70	$2,450.89
8/3/2017	254	$894.19	254	$1,353.00	$2,247.19
7/5/2017	278	$958.99	278	$1,451.16	$2,410.15
6/2/2017	267	$929.29	267	$1,406.17	$2,335.46
5/4/2017	245	$869.89	245	$1,316.19	$2,186.08
4/5/2017	253	$891.49	253	$1,348.91	$2,240.40
3/6/2017	279	$961.69	279	$1,455.25	$2,416.94
2/3/2017	289	$988.69	289	$1,496.15	$2,484.84
1/5/2017	257	$902.29	257	$1,365.27	$2,267.56
12/6/2016	314	$1,020.63	314	$1,543.73	$2,564.36
11/3/2016	230	$801.39	230	$1,211.93	$2,013.32
10/5/2016	244	$837.93	244	$1,267.23	$2,105.16
9/6/2016	210	$749.19	210	$1,132.93	$1,882.12
8/8/2016	224	$785.73	224	$1,188.23	$1,973.96
7/8/2016	273	$913.62	273	$1,381.78	$2,295.40
6/9/2016	265	$892.74	265	$1,350.18	$2,242.92
5/10/2016	266	$895.35	266	$1,354.13	$2,249.48
4/11/2016	279	$929.28	279	$1,405.48	$2,334.76
3/10/2016	253	$861.42	253	$1,302.78	$2,164.20
2/9/2016	231	$804.00	231	$1,215.88	$2,019.88
1/11/2016	240	$827.49	240	$1,251.43	$2,078.92
12/10/2015	262	$884.91	262	$1,338.33	$2,223.24
11/9/2015	226	$790.95	226	$1,196.13	$1,987.08

Note: W&S consumption provided but costs are calculated

City of Coral Springs rates

$2.70 per kgal, volume cost of water

$4.09 per kgal, volume cost of sewer

$6.79 per kgal, total

BH35-Broward EPD Lab

Account #:	101962-001				
Acct Name:	Broward CO. EPD Lab				
Site Address:	3211 College Ave., Davie, FL 33314				
Water Utility:	City of Davie				
Meter #					
Read Date	Water Cons. (kGal)	Water Cost ($)	Sewer Cons. (kGal)	Sewer Cost ($)	Total Bil Amount ($)
12/20/2017	3	$172.48	3	$208.55	$381.03
11/15/2017	27	$311.68	27	$371.27	$682.95
10/18/2017	67	$535.39	67	$631.98	$1,167.37
9/20/2017	66	$524.46	66	$618.66	$1,143.12
8/23/2017	124	$851.58	124	$1,001.48	$1,853.06
7/19/2017	37	$360.90	37	$428.28	$789.18
6/21/2017	3	$169.14	3	$202.88	$372.02
5/17/2017	2	$162.50	2	$196.28	$358.78
4/19/2017	2	$163.50	2	$196.28	$359.78
3/22/2017	4	$174.78	4	$209.48	$384.26
2/15/2017	3	$169.14	3	$202.88	$372.02
1/18/2017	4	$174.78	4	$209.48	$384.26
12/21/2016	2	$163.50	2	$196.28	$359.78
11/16/2016	2	$163.50	2	$196.28	$359.78
10/19/2016	2	$162.60	2	$194.73	$357.33
9/21/2016	5	$178.61	5	$213.10	$391.71
8/17/2016	4	$173.05	4	$206.59	$379.64
7/20/2016	4	$173.05	4	$206.59	$379.64
6/22/2016	4	$173.05	4	$206.59	$379.64
5/18/2016	2	$161.93	2	$193.57	$355.50
4/20/2016	2	$161.93	2	$193.57	$355.50
3/23/2016	4	$173.05	4	$206.59	$379.64
2/17/2016	2	$161.93	2	$193.57	$355.50
1/20/2016	2	$161.93	2	$193.57	$355.50

Town of Davie rates effective 10/1/16

$5.64 per kgal, volume cost of water

$6.60 per kgal, volume cost of sewer

$12.24 per kgal, total