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OF COUNTY COMMISSIONERS
MIAMI-DADE COUNTY, FLORIDA

MEMORANDUM

MIAMI-DADE COUNTY

Agenda Item No. 8(F)(1)(A)

Resolution No. R-1147-09

Date: October 6, 2009

To: Honorable Chairman Dennis C. Moss
and Members, Board of County Commissioners

From: George M. Burgess
County Manager

Subject: Recommendation for Award of Energy Performance Contract at Miami International Airport's Main Terminal to FPL Services, LLC.

RECOMMENDATION

It is recommended that the Board approve the attached Energy Performance Contract in an amount not to exceed $6,046,925 to FPL Services, LLC (FPLS) for work to be performed at Miami International Airport's Main Terminal. This recommendation has been prepared by the General Services Administration (GSA) at the request of the Miami-Dade Aviation Department (MDAD).

BACKGROUND

On July 1, 2008, via Resolution R-740-08, the Board of County Commissioners approved the establishment of an Energy Performance Contracting (EPC) Program for Miami-Dade County. The EPC program enables the County to use private energy services companies, or ESCOs, to identify recommendations for reducing the energy consumption of County facilities and equipment. These projects – if approved by the County – are performed in a turn-key fashion by the ESCOs, who must guarantee that the projected savings in County utility and maintenance expense will meet or exceed all project costs, including any financing costs. As approved by the Board, the program utilizes the pool of ten ESCOs established by the State of Florida in State Contract 973-320-08-01.

The above-described contract replaces the County's previous EPC program, which was approved under Contract 168A by the Board in 1988 for a five-year term, with five one-year renewal option periods. That contract expired in June 2008. FPLS was one of three ESCOs performing services under Contract 168A. It is also one of the ten firms in the State pool utilized by the County in the current EPC program.

It was under Contract 168A that FPLS was first authorized to proceed with the energy audit of Terminal E, Concourse E, Satellite E, Terminal F, Concourse F, Terminal G, Terminal H and Concourse H at Miami International Airport (MIA). The size of area and number of building systems, equipment and fixtures to be assessed made the audit an extremely complex and lengthy process. In September 2006, the need to delay the audit of some areas due to ongoing construction projects, as well as lengthy delays incurred in securing appropriate federal security clearances for FPLS to enter some of the affected areas, led to a decision to separate the original scope of work into two parts. The first audit was completed and submitted to County staff in June 2007. Following a thorough review by staff and receipt of a revised audit, a work order to proceed with the approved project was issued August 30, 2007.

Following that approval, FPLS continued to work on the audit of the remaining areas in the original scope of services. Although diligent effort was made, FPLS was unable to complete the second audit prior to the end of the contract term in June 2008. The audit was ultimately submitted in September 2008.

Due to the expiration of Contract 168A, the second phase of the EPC project cannot be authorized under that contract; however, as stated above, FPLS is also one of ten ESCOs in the vendor pool for the County's current EPC program. Subsection (4)(d) of Chapter 489.145 Florida Statutes, which regulates guaranteed energy performance savings contracting, requires that performance savings contractors be selected competitively, in compliance with Chapter 287.055 F.S., unless it can be shown that fewer than

three firms are qualified to perform the required services. That is the case in this situation. No ESCO other than FPLS is in a position to implement (and guarantee the results of) any improvements without completing an investment grade energy audit. Such an audit, along with the securing of the requisite federal security clearances, cannot realistically be completed in less than 15 to 18 months.

The financial impact of the above delay would run into the tens of thousands of dollars in lost electrical and maintenance savings, as well as delay critically needed lighting improvements in the terminal and concourse areas. In addition, the County would immediately reap the benefits of the newer equipment, with manufacturer warrantees, improved reliability and reduced maintenance interruptions. As has been demonstrated by the lighting improvements already completed under the first phase of the Terminal project, lighting levels and aesthetics have significantly improved the customer experience. The improvements also bring the affected areas into compliance with the Energy Policy Act of 2005 (effective January 2008) by removing existing mercury vapor lighting fixtures. The recommended improvements, which not only save energy but remove mercury from the area, also increase our compliance with County Ordinance 07-65, approved by the Board on May 8, 2007, which established the Sustainable Buildings Program. Finally, use of the existing survey makes this a "shovel-ready" project and contributes immediately to the County's overall economical stimulus effort.

It is therefore recommended that the attached contract with FPL Services, LLC be approved. Pertinent information regarding the contract is summarized below.

COMMISSION DISTRICT:	District 6
COMMISSION DISTRICTS IMPACTED	Countywide
PROJECT NAME:	Energy Performance Contract for the Main Terminal and Concourses at Miami International Airport, Phase 2
CONTRACT AUTHORITY:	State of Florida Contract 973-320-08-01 Energy Performance Contracting Program, authorized by Resolution R-740-08
PROJECT DESCRIPTION:	The scope of work will include replacement of the lighting fixtures at all or portions of Terminals A, B, C, E, F, G and H, Concourses E, F, G and H and Satellite E of Miami International Airport. A total of 18,552 fixtures will be either completely replaced or retrofitted through this contract. The services will include energy auditing, design, specifications, permits, purchase, installation, commissioning, measuring and verification of the results, training, and annual reporting on the savings achieved.
USING/MANAGING DEPARTMENT:	The project will be performed in facilities operated by the Miami-Dade Aviation Department. The Energy Performance Contracting Program is administered by the General Services Administration. The GSA Project Manager is Reinaldo Abrahante, Engineer 3.
CONTRACT AMOUNT:	$6,046,925

DELEGATION OF AUTHORITY:

In addition to the authority to execute and implement this contract, which is consistent with those authorities granted under the Code of Miami-Dade County, the County Mayor or County Mayor's designee is also authorized to approve project financing terms, enter into leases or other financial arrangements with Third Parties, authorize escrow payments for completed project milestones, exercise termination provisions, and determine substantial completion of projects.

The County Mayor or designee is also authorized to approve modifications to the scope of work, so long as said changes will not cause forfeiture of this contract's compliance with § 489.145, Florida Statutes, or violate the terms of the Third Party Financing Agreement, Energy Savings Warranty, or any other applicable clause or schedule of this contract. This latter authority is required in order to provide staff with the flexibility to address material issues that may not become evident until after construction drawings are complete, or during the contracting process for third-party financing.

OPERATIONS COST IMPACT/FUNDING:

The implementation of this contract is expected to result in a reduction of electricity costs at this facility of $680,000 per year, averaged over the next eleven years.

MAINTENANCE COST IMPACT/FUNDING:

The implementation of this contract is expected to result in a reduction of maintenance costs at this facility of $77,000 a year, averaged over the next eleven years.

FUNDING SOURCE:

Operating Revenues. The costs of this contract are guaranteed by FPLS to be covered by the reduction in energy and maintenance costs. As a result, no increase in funding, either capital or operating, is required for this project.

PTP FUNDING:

No

GOB FUNDING:

No.

AGREEMENT PERIOD:

Eighteen months for construction, followed by an eleven-year "Energy Warranty Period" (during which savings are guaranteed).

PRIME CONTRACTOR:

FPL Services, LLC.

COMPANY PRINCIPAL:

Greg Hanlon, Vice President

COMPANY ADDRESS:

6001 Village Boulevard
West Palm Beach, Fla. 33407

Wendi J. Norris, Director
General Services Administration

MEMORANDUM
(Revised)

TO: Honorable Chairman Dennis C. Moss and Members, Board of County Commissioners

DATE: October 6, 2009

FROM: R. A. Cuevas, Jr. County Attorney

SUBJECT: Agenda Item No. 8(F)(1)(A)

Please note any items checked.

_____ **"3-Day Rule" for committees applicable if raised**

_____ **6 weeks required between first reading and public hearing**

_____ **4 weeks notification to municipal officials required prior to public hearing**

_____ **Decreases revenues or increases expenditures without balancing budget**

_____ **Budget required**

_____ **Statement of fiscal impact required**

_____ **Ordinance creating a new board requires detailed County Manager's report for public hearing**

_____ **No committee review**

_____ **Applicable legislation requires more than a majority vote (i.e., 2/3's ____, 3/5's ____, unanimous _____) to approve**

__✓__ **Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required**

Approved _____ Mayor

Veto _____

Override _____

Agenda Item No. 8(F)(1)(A)

10-6-09

RESOLUTION NO. **R-1147-09**

RESOLUTION AUTHORIZING EXECUTION OF AN ENERGY PERFORMANCE CONTRACT WITH FPL SERVICES, LLC, PURSUANT TO CHAPTER 489.145 (4)(d) OF THE FLORIDA STATUTES, IN AN AMOUNT NOT TO EXCEED $6,046,925, FOR WORK TO BE PERFORMED AT THE MIAMI INTERNATIONAL AIRPORT'S MAIN TERMINAL; AND AUTHORIZING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO EXERCISE ANY AND ALL OTHER RIGHTS CONFERRED THEREIN

WHEREAS, on July 1, 2008, via Resolution R-740-08, the Board of County Commissioners approved the establishment of an Energy Performance Contracting Program for Miami-Dade County; and

WHEREAS, under such Resolution the Board waived competitive bidding for the selection of qualified vendors; and

WHEREAS, the work to be performed by FPL Services, LLC meets all requirements of the County's Energy Performance Contracting Program, and FPL Services, LLC is an approved vendor for that program; and

WHEREAS, Chapter 489.145, Subsection (4)(d) Florida Statutes permits the Board to waive the requirement to select guaranteed energy, water, and wastewater performance savings contractors in compliance with Chapter 287.055 F.S., if fewer than three firms are qualified to perform the required services; and

WHEREAS, this Board desires to accomplish the purposes outlined in the accompanying memorandum, a copy of which is incorporated herein by reference,

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF DADE COUNTY, FLORIDA, that this Board hereby and approves the award of an Energy Performance Contract to FPL Services, LLC, pursuant to Chapter 489.145

(4)(d) of the Florida Statutes, in an amount not to exceed $6,046,925, for work to be performed at Miami International Airport's Main Terminal, in substantially the form attached hereto; and authorizes the County Mayor or County Mayor's designee to execute same for and on behalf of Miami-Dade County; and authorizes the County Mayor or County Mayor's designee to exercise any and all other rights conferred therein.

The foregoing resolution was offered by Commissioner Jose "Pepe" Diaz, who moved its adoption. The motion was seconded by Commissioner Sally A. Heyman and upon being put to a vote, the vote was as follows:

Dennis C. Moss, Chairman aye
Jose "Pepe" Diaz, Vice-Chairman aye

Bruno A. Barreiro	aye	Audrey M. Edmonson	aye
Carlos A. Gimenez	aye	Sally A. Heyman	aye
Barbara J. Jordan	aye	Joe A. Martinez	aye
Dorrin D. Rolle	aye	Natacha Seijas	absent
Katy Sorenson	aye	Rebeca Sosa	aye
Sen. Javier D. Souto	aye		

The Chairperson thereupon declared the resolution duly passed and adopted this 6th day of October, 2009. This resolution shall become effective ten (10) days after the date of its adoption unless vetoed by the Mayor, and if vetoed, shall become effective only upon an override by this Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

By: **DIANE COLLINS**
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.

Hugo Benitez

ENERGY PERFORMANCE CONTRACT

By and Between

MIAMI-DADE COUNTY

and

FPL SERVICES, LLC.

June 23rd, 2009

MIAMI INTERNATIONAL AIRPORT
TERMINALS/COUNCOURSES PHASE TWO PROJECT

7

GUARANTEED ENERGY PERFORMANCE SAVINGS CONTRACT
By and Between FPL Services and Miami-Dade County

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GUARANTEED ENERGY PERFORMANCE SAVINGS CONTRACT

This Guaranteed Energy Performance Savings Contract (this "Contract") is made and entered into as of the day last signed below, at 111 NW 1st Street, in the County of Miami-Dade, State of Florida, by and between FPL Services, LLC ("Company"), having its principal offices at 6001 Village Blvd., West Palm Beach, FL. 33407, and Miami-Dade County ("County") with its principal offices at 111 NW 1st Street, Miami, FL 33128, for the purpose of installing certain equipment, and providing other services designed to reduce energy consumption and energy related operating costs for the County.

RECITALS

WHEREAS, on January 1, 2008 , the Company and the Florida Department of Management Services entered into State Term Contract No. DMS 973-320-08-1, authorizing the Company to perform work for the State of Florida and other eligible users under the "Guaranteed Energy, Water, and Wastewater Performance Savings Contract Act" as set forth in § 489.145, Florida Statutes (the "Act"); and

WHEREAS, the Miami-Dade Board of County Commissioners approved Resolution R-740-08, authorizing contracting with the various firms in the vendor pool listed in the above mentioned State Contract.

WHEREAS, pursuant to the State Term Contract, the County obtained from Company an Audit that (i) recommends certain Conservation Measures at the Facilities, (ii) summarizes the costs of those Conservation Measures, and (iii) provides an estimate of the amount of cost savings resulting from those Conservation Measures; and

WHEREAS, the County finds that the amount it would spend on the Conservation Measures will not likely exceed the amount of the cost savings for up to twenty (20) years after the date of installation, based on the calculations required under the Act; and

WHEREAS, the qualified company gives a written guarantee that the cost savings will meet or exceed the costs of the system and the actual cost savings must meet or exceed the estimated cost savings provided in the executed contract; and

WHEREAS, all selection criteria, notice requirements, certifications and approvals set forth in the Act have been satisfied or obtained; and

WHEREAS, Company has made an assessment of the energy performance characteristics of the facilities and existing Equipment described in Schedule B, which the County has approved; and

WHEREAS, the Parties desire that Company install the Conservation Measures at the Facilities in accordance with and subject to the terms set forth in this Contract.

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, and intending to be legally bound hereby, the County and the Company agree as follows:

SECTION 1. DEFINITIONS.

SECTION 1.1 DEFINITIONS.

The following terms have the meanings specified below unless the context clearly requires otherwise:

"County" means Miami-Dade County, Florida.

"Annual Excess Savings" means the amount of any actual annual Cost Savings that exceeds total annual contract payments made by the County under this Contract for such calendar year pursuant to § 489.145(3)(d)(2).

"Annual Reconciliation" means a determination pursuant to § 489.145(5)(e), Florida Statutes, and Section 5.3 of this Contract, as to whether a shortfall in annual Cost Savings or an excess in annual Cost Savings exists based on the provisions of Company's written savings guarantee reflected in Schedule C (Savings Guarantee) with savings calculated according to Schedule F (Savings Calculation Formula).

"**Baseline**" means the County's energy consumption for each CM Group. The initial Baseline shall be for each month of the calendar year preceding the year this Contract is entered and is set forth in Schedule E (Baseline). To the extent the Baseline may be adjusted, it shall be adjusted in accordance with Schedule F.

"**Commencement Date**" means, with respect to each CM Group, the first day of the calendar month after which all of the following events have occurred: (i) all schedules are in final form and accepted by the County; (ii) the Company has delivered a notice to the County that it has completed all of the CMs in a CM Group in accordance with the provisions of Schedule G (Construction and Installation Schedule); and (iii) the County has inspected and accepted said installation and operation as evidenced by an executed Certificate of Acceptance as set forth in Exhibit III.

"**Company**" means the contractor identified in the first paragraph of this Contract. .

"**Conservation Measure**" or "**CM**" means each of the facility alterations or equipment purchases set forth in Schedule A, together with any training programs incidental to this Contract, which reduces energy consumption, or energy-related operating costs at the Facilities. CMs may only include, and this contract is void as to any other measures than, items listed in § 489.145 (3) (b) Florida Statutes. Also know as ECM (Energy Conservation Measure).

"**Cost Savings**" means the measured reduction in the cost of energy and stipulated operation and maintenance, if applicable, created from the implementation of one or more Conservation Measures when compared with the established Baseline. The Cost Savings shall be determined in accordance with the formulas and methodologies set forth in Schedule F, which will include a minimum real return on investment calculation and a specification of a benchmark cost of capital.

"Equipment" means all items of property described in the Schedule A (Conservation Measures to Be Installed by the Company) and any other items of property pursuant to § 489.145(3)(b) Florida Statutes.

"Facilities" means the County-owned facilities as described in the first paragraph of this Contract and reflected on Schedule B, Description of Facilities. A Facility must be a distinct auditable unit.

"Fiscal Year" means the annual period from October 1st to September 30th.

"CM Group" means each group of CMs or other deliverables as listed in Schedule A. A CM Group may not be smaller than an auditable unit or greater than a facility. With respect to each CM Group, this Contract, together with County Certificate of Acceptance, and the fully executed Description of Facilities relating thereto, shall constitute a separate contract relating to each CM Group. With respect to any CM Group, the payment due from the County to either Company, or a Lender under any Financing Agreement is shown in the Schedule D (Compensation to Company and Deliverables).

"**Guarantee**" means Company's guarantee reflected on Schedule C (Energy Savings Guarantee), whereby Company guarantees that the savings will meet or exceed the costs of the CMs and the estimated cost savings established under this Contract.

"Interim Period" means the period from the date the contract is signed until the Commencement Date.

"Investment Grade Energy Audit" or **"Audit"** means the detailed energy audit performed by the Company, along with an accompanying analysis of the Conservation Measures, and their costs, savings, and benefits prior to entry of this Contract. The Audit includes a narrative describing and justifying the need for the CMs. The Audit is attached as Appendix A and has been accepted by the County.

"Legally Available Funds" means funds duly appropriated or otherwise legally available for the purpose of making payments under this Contract.

"Non-Appropriation" means the failure of an appropriation or availability of the Board of County Commissioners to appropriate money for any Fiscal Year sufficient for the continued performance by the County of all of the County's obligations under this Contract as evidenced by the passage of a final budget which does not include funding sufficient to pay all payments due.

"Parties" means both the County and the Company collectively.

"Savings Calculation Formula" means the Company's Savings Calculation Formula reflected on Schedule F.

"Term" means the term of this Contract as set forth in *Section 3* of this Contract.

SECTION 2. INCORPORATION OF OTHER DOCUMENTS

Section 2.1.

This Contract incorporates and makes a part hereof the following documents, listed in their order of precedence in the event of a conflict between any of their terms and conditions:

1- This Contract
2- All Schedules and Appendixes listed in the Table of Contents
3- The Investment Grade (Technical) Energy Audit (Appendix A)
4- The State Term Contract [*currently 973-320-08-1*] (Appendix B)
5- The Model Financing Agreement (Appendix C).

Section 2.2. Investment Grade (Technical) Energy Audit.

The Company has, under separate agreement, submitted the complete Investment Grade Energy Audit and analysis of the Facilities attached as Appendix A and dated October 2008, which have been approved and accepted by the County. The Investment Grade Energy Audit includes all Conservation Measures agreed upon by the Parties.

SECTION 3. TERM OF CONTRACT

Section 3.1 Initial Term; Interim Period.

Each CM Group shall have its own individual Term. The Term shall begin on the date this Contract becomes fully executed and, subject to the renewal provision in Section 3.2 and the termination provisions in Section 7 shall expire at the end of Fiscal Year in which the Commencement Date occurred. The Contract shall be effective and binding upon the parties immediately upon the date it is last signed, and the period from such contract execution until the Commencement Date shall be known as the Interim Period.

Section 3.2 Renewals.

The Term shall automatically renew for each successive Fiscal Year subject to the County making sufficient annual appropriations based upon continued realized savings provided, however, the Term shall not extend beyond the earlier of (i) the effective date of termination under Section 7 of this Contract; or (ii) twenty (20) years after the Commencement Date.

SECTION 4. SCOPE OF WORK

Section 4.1 Installation of CMs

(a) The Company shall install the CMs in the Facilities pursuant to specifications in Schedule A and Appendix A. Construction and installation shall proceed in accordance with the Construction Schedule approved by County and attached hereto as Schedule G (Construction and Installation Schedule).

(b) The Company shall perform all tasks/phases under this Contract in such a manner so as not to harm the structural integrity of the buildings or their operating systems and so as to conform to common Engineering Practice and the Construction Schedule specified in Schedule G (Construction and Installation Schedule). The Company shall repair and restore to its original condition any area of damage caused by the Company's performance under this Contract. The County reserves the right to direct the Company to take certain corrective action if the structural integrity of the Facilities or its operating system is or will be harmed. All costs associated with such corrective action to damage caused by the Company's performance of the work shall be borne by the Company.

(c) The Company shall remain responsible for the professional and technical accuracy of all services performed, whether by Company or its subcontractors or others on its behalf, throughout the term of this Contract.

(d) The County may request, by written notification, changes altering or deducting from the work listed in Schedule A, provided that such changes are within the general scope of the contract. An equitable and mutually agreeable adjustment in the contract price and/or the work schedule may be made if the changes affect the cost or time of performance. Such equitable adjustments will require the written consent of the Company, which shall not be unreasonably withheld. Changes will not be effected if they are to cause forfeiture of this contract's compliance with § 489.145, Florida Statutes. Changes will not be effected if they are expected to violate the terms of the Third Party Financing Agreement, the Energy Savings Warranty, or any other applicable clause or schedule of this contract, unless the changes to these documents and/or clauses can be effected within § 489.145, Florida Statutes, and agreed upon by all applicable parties.

Section 4.2 Acceptance of CMs.

(a) When the Company considers the CM Group to have been substantially completed in accordance with all contractual requirements, the Company shall provide the County with a written request for a substantial completion inspection. Within ten (10) business days from receipt of the Company's written request, the County will make an inspection to determine whether the CM Group installation is complete. If the County determines the CM Group installation is not complete, the County will provide the Company with a specific material performance deficiency list of all items that must be corrected or completed before the County would consider the CMs complete.

If the Company receives a deficiency list and once the Company has completed all items on the deficiency list, Company can request a second inspection by the County to verify the CM Group to be installed is complete. Again, the re-inspection shall occur within ten (10) business days and a written response within fifteen (15) business days. When the CM Group to be installed is considered completed, and the County has received from the Company all appropriate certificates of title, the County will provide the Company a written document of approval of substantial completion.

(b) The Parties intend that the County's Acceptance of Substantial Completion will be executed for each CM Group installation as soon as the installation is complete and beneficial use is provided. However, it is anticipated and agreed that County may require use of some installed and completed CMs prior to the completion of all CMs. In such situations, the Parties will conduct acceptance inspections and Certificates of Acceptance of CM as described above, for that CM Group to be installed which is being operated and the County is receiving beneficial use. Except as specified elsewhere, any maintenance and repairs due to ordinary wear and tear caused by such use will be made at the expense of the County.

Section 4.3 Records and Data

(a) The County has furnished or shall furnish to Company, upon its request, all of its records and complete data concerning energy usage for the Facilities described in Schedule B. During the Term, the County will provide the Company data on bills relevant to CMs on a regular basis so that Company may provide the Cost Savings report identified in subsections 4.3(b) and 5.3 below.

(b) The reports to be issued by the Company to the County are more particularly delineated in Schedule D, Deliverables. At a minimum, Company shall provide an annual Cost Savings and reconciliation report calculated in accordance with Schedule F (Savings Calculation Formulae).

(c) The Company shall also furnish the County with a full set of diagrams, instructions, manuals, reports and other documentation needed to maintain and operate the CMs.

(d) If this Contract is terminated for any reason, all finished or unfinished documents, data, studies, correspondence, reports and any other products prepared for the purpose of performing this Contract, shall be made available to, or delivered to, the County for its use before any additional payments are made for any reason.

(e) The Company shall be subject to audit by the County or its designee. The County shall have the right upon reasonable notice to have its employees or agents inspect all of the books and records of the Company relating to this Contract at Company's principal place of business during County's normal business hours.

(f) If the County receives a public records request related to the Contract, the Company shall be solely responsible for taking whatever action it deems appropriate to legally protect its claim of exemption from the public records law.

Section 4.4 Training.

The Company shall conduct the training program described in Schedule H (Company's Training Responsibilities) hereto. The training specified in Schedule H must be completed prior to final acceptance of the CM. Company shall provide ongoing training whenever needed with respect to updated or altered equipment, including upgraded software as defined by the software manufacturer. Such training shall be provided at no additional cost to County.

Section 4.5 Permits and Approvals.

The Company shall be responsible for obtaining all governmental permits and approvals as may be required for installation of the CMs and for the performance of its obligations hereunder. The County shall cooperate with the Company in obtaining all such permits and approvals. In no event shall the County, however, be responsible for payment of any permit fees. The equipment furnished by the Company shall conform to all federal, state and local code requirements. The Company shall furnish copies of each permit or license which is required to perform the work to the County before the Company commences the portion of the work requiring such permit or license.

SECTION 5. PAYMENTS BY THE COUNTY

Section 5.1 Energy Performance Savings Guarantee.

The Company has formulated and provided a written Guarantee that the Cost Savings will meet or exceed the costs of the Conservation Measures and the estimated cost savings set forth in the Audit pursuant to § 489.145(4)(c), Florida Statutes, and that the amount of any actual annual savings meet or exceed total annual contract payments made by the County for the contract pursuant to § 489.145 (3)(d)(2), Florida Statutes. The Guarantee is attached as Schedule C, providing the annual level of Cost Savings to be achieved as a result of the Conservation Measures provided for in this Contract and in accordance with the Savings Calculation Formula as set forth in Schedule F, which is calculated in compliance with Florida law. The Guarantee is set forth in annual increments for the term of the Contract as specified in Schedule C and has been structured so as to be sufficient to cover any and all annual payments required to be made by the County.

Section 5.2 Measuring Cost Savings.

The Parties will measure the Cost Savings using the cost savings formula set forth in Schedule F and the monitoring and verification plans. The Company will ensure that the reported Cost Savings have in fact been recognized or the provisions of Sec. 5.3 will apply. The Cost Savings shall be based on the Federal Energy Management Program's (FEMP) M&V Guidelines: Measurement and Verification for Federal Energy Management Projects version 3.0.

Section 5.3 Annual Reconciliation.

(a) Reconciliation Reports. Pursuant to § 489.145(5)(e), Florida Statutes, the Company is required to provide to the County an annual reconciliation of the Cost Savings. Within sixty (60) days after each year from the Commencement Date, the Company will deliver to the County's Contract Manager, identified in Section 19.9 below, an Annual Reconciliation report for such calendar year, reflecting the amount guaranteed and the amount of actual Cost Savings achieved. Upon delivery of the report and all supporting documentation, the County will have sixty (60) business days to accept or reject the report. The County shall provide written notice of such rejection, within the stated acceptance period, specifying the basis of the deficiency. The Company shall have sixty (60) business days to cure such deficiency and deliver to the County a corrected reconciliation report. If the County fails to reject a report (including corrected reconciliations) within 60 business days of receipt of all required documentation, County shall be deemed to have accepted the Annual Reconciliation contained in the report as of the final day of the 60th business day period, unless a longer acceptance period is mutually agreed upon in writing.

(b) Annual Shortfalls. If the Annual Reconciliation reveals a shortfall in guaranteed Cost Savings, the Company is liable for such shortfall and shall pay to the County the amount of the shortfall, together with interest equal to that provided in any financing agreement from the time the Annual Reconciliation first revealed a shortfall and the time of repayment. The County shall submit to the Company a written statement as to the amount of the shortfall (Shortfall Payment Demand) to the extent the Annual Reconciliation or a County M&V Plan review reveals such shortfall, which may be incorporated into the County's response to the Company's Annual Reconciliation. The Company shall remit such payments to the County within sixty (60) days of written notice by the County of such monies due. If the Company fails to make such payment to the County within 60 days after demand therefore, the County will demand payment pursuant to the security instrument identified in Exhibit II (Corporate Guarantee).

(c) Annual Excess Savings. Any annual excess savings will accrue to the County.

Section 5.4 County Payments.

The County shall allow draws from a pre-established escrow account to go to the Company as set forth in Schedule D (Compensation to the Company and Deliverables), based on completed milestones previously established, and once the project is completed to the extent that sufficient savings are being accrued to offset the due payments, pay the Lender pursuant to a separately established Financing Agreement. All other payment and contract provisions of § 287.058 (1) Florida Statutes, are incorporated herein by reference.

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The County shall not be required to allow any payments to go to the Company under this Contract unless and until the work required under a particular milestone has been completed to the County's satisfaction.

Section 5.5 Financing.

Upon execution of this contract, the Parties agree to, pursue a separate financing agreement with a third party in order to allow the County to finance this acquisition. This vehicle will constitute the County's source of funding for its obligations under this Contract.

Unless a more favorable vehicle is found once this contract is executed, it is expected that this financing vehicle will be a Tax-Exempt Municipal Lease-Purchase Agreement, in substantially the form attached in Appendix C.

A tax-exempt lease-purchase agreement ("Municipal Lease") is like an installment-purchase agreement rather than a traditional lease or rental agreement. Under most rental agreements (such as those used in car leasing), the renter (lessee) returns the asset (the car) at the end of the lease term, without building any equity in the asset being leased and can postpone the decision to acquire the asset being financed until the end of the lease term. A lease-purchase agreement however, presumes that the public sector organization will own the equipment after the term expires. Further, the interest rates are appreciably lower than those on a taxable commercial lease-purchase agreement because the interest paid on this instrument is exempt from federal income tax for public sector entities. A rate of 4.6%, based on a preliminary, informal quote, has been used as an estimate for the financial calculations that are part of this document. The actual rate that will apply to this project will be obtained once this contract is executed.

In addition, a tax-exempt lease-purchase agreement does not constitute a long-term debt obligation because of non-appropriation language that is written into the agreement. This language limits the payment obligation to the organization's current operating budget period. Therefore, if for some reason future funds are not appropriated, the equipment is returned to the lender, and the repayment obligation is terminated at the end of the current operating period without placing any obligation on future budgets.

The salient features and minimum requirements of the Municipal Lease that the County will endeavor to obtain are that:

- The guaranteed annual energy and related maintenance savings will meet or exceed the County's annual payments towards the lease, throughout the duration of the lease. Note: The duration of this lease is expected to be between ten and twelve years.
- The County's payment obligation to the lender will be based exclusively on annual operating budget appropriations.
- At the term of the lease, the County will own the equipment listed in this contract.
- An option by the County to prepay (purchase) will be included.
- The payment schedule on the lease will be arranged so no payment to the lender is due until the work in this contract is scheduled to be completed, per the construction schedule submitted by the Company (Schedule G).

Note: If the terms of the financing vehicle are substantively different than the previous financing vehicles provided and such terms are unacceptable to the County, or if a lender willing to provide an acceptable financing vehicle cannot be located, the County will not proceed with the implementation of the project.

The salient features of the process that will be involved in the Municipal Lease that the County will endeavor to obtain are:

- The Company will obtain rate quotes and payment term proposals from a minimum of three lenders. The County will select the most favorable quote and terms, and request a proposed lease from the selected lender.
- The proposed Municipal Lease will be reviewed by counsel for legal sufficiency and by County staff for adequacy to its needs.
- The Municipal Lease will be executed by the County Manager or his designee, per Resolution R-740-08.
- Once the lease is executed, an escrow account will be created by the lender, with the County's approval. An amount sufficient to cover the value of this contract will be deposited by the lender into this account. As the work under this contract progresses, and based on pre-established milestones, the Company will submit to the County, for approval, escrow account draw requests, as the means of compensation for its work, per Section 5.4. Interest earned by the funds that are maintained in this escrow account will belong to the County.
- At the end of the construction period, and once all of its obligations and required deliverables are fulfilled, the Company will submit to the County its final draw request and a Final Completion Certificate. Upon the County's acceptance and processing of these documents, and once the related funds are withdrawn from the escrow account to the Company, any unclaimed funds left in the escrow account will be retained by the County. These funds will be used towards a reduction on the principal owed by the County in the Municipal Lease, a reduction on the first payment owed by the County on the lease, or returned by the escrow institution in the form of a check or similar means.

Section 5.6 Current Expense.

The County's obligations hereunder constitute a current expense that is payable exclusively from Legally Available Funds and shall not be construed to be debt, liability or obligation within the meaning of any applicable constitutional or statutory limitation or requirement. Neither the County nor the State nor any political subdivision or agency thereof has pledged any of its full faith and credit or its taxing power to make any payments under this Contract.

Section 5.7 Baseline Costs.

Actual savings are measured against baseline costs, the expenses that the County would have incurred had this project not been implemented. The parties agree that baseline costs shall be calculated using the Baseline set forth in Exhibit E, which has been based on the Federal Energy Management Program's (FEMP) *M&V Guidelines: Measurement and Verification for Federal Energy Management Projects version 3.0.* Details of the Monitoring and Verification methodology shall be agreed upon by the Parties.

SECTION 6. FISCAL FUNDING

Section 6.1 Annual Appropriations.

The County's performance and obligation to pay under this Contract is contingent upon an annual appropriation. The County is subject to the appropriation of funds by its governing body in an amount sufficient to allow continuation of its performance in accordance with the terms and conditions of this Contract for each and every Fiscal Year following the Fiscal Year in which the Contract is in effect.

Section 6.2 County's Intent to Request Appropriations and Make Payments. The County intends for this Contract to continue until all payments contemplated under Section 5 have been satisfied. The Parties acknowledge that appropriation for such payments is a governmental function that the County cannot contractually commit its governing body to perform and this Contract does not constitute such a commitment. However, the County reasonably believes that money in an amount sufficient to make all payments can and will lawfully be appropriated and made available to permit continued utilization of the CM's in the performance of its essential functions during the applicable terms.

Section 6.3 Notice of Non-Appropriation.

The County shall, upon learning that sufficient funds will not be available to continue its full and faithful performance under this contract, provide prompt written notice to the Lender and any other affected parties of such and event.

Section 6.4 Return of Equipment.

Upon termination for Non-Appropriation under Section 7.1 or 7.2, the County shall no longer be responsible for the payment of any additional payments coming due in succeeding Fiscal Years. If requested by the Lender, and within thirty (30) days of such written notice, cause all equipment in a CM Group that the County is no longer responsible for the payment of (together with all documents necessary to transfer legal and beneficial title thereto to the Lender) to be returned to the Lender. Any other terms and conditions regarding the Return of Equipment will be agreed upon between the County and the Lender under a separate Financial Agreement.

SECTION 7. TERMINATION

Section 7.1 Termination for Non-Appropriation.

This Contract shall immediately terminate with respect to each CM Group for which a Non-Appropriation has occurred. The termination shall be effective as of the last day for which funds were appropriated. In the event that the appropriations has not been adopted by the governing body of County prior to the expiration of a Fiscal Year, and the Notice of Non-Appropriation is not yet due under Section 6.3, the Term will be deemed extended and renewed pending the enactment of such appropriations act. If any payments are due under this Contract during such period, such Term will be extended and renewed only if: (a) an interim or emergency budget implemented by the governing body of the County pending enactment of a final budget makes available to the County money that may legally be used to make payments during such period; or (b) sums are otherwise available to make such payments.

Section 7.2 Company Option to Terminate Balance of CMs.

In the event of a termination under Section 7.1 above, the Company may elect to terminate this Contract with respect to all, but not less than all, of the remaining CMs. This election shall be made by written notice to the County within thirty (30) days after the Non-Appropriation has occurred and shall be effective upon the last day of the Fiscal Year for which funds were not appropriated. Upon the effective date of the termination, the County shall pay to the Company any payments and other amounts that are due and have not been paid at or before the end of its then current Fiscal Year with respect to this Contract. In the event of termination of this Contract as provided in this Section the County shall comply with Sections 6.4 regarding the return of equipment.

Section 7.3 Termination Upon Default.

This Contract is also subject to termination upon the occurrence of an event of default, as provided in Section 14 below.

Section 7.4 Effect of Termination.

No CM Group Schedule shall be executed after any termination due to Non-Appropriation or Event of Default.

SECTION 8. WARRANTIES

Section 8.1 Equipment Warranties.

The Company covenants and agrees that all materials and equipment to be installed as part of this Contract shall be new, in good and proper working condition and protected by appropriate original equipment manufacturer (OEM) written warranties covering all parts and equipment performance. A minimum warranty of one year in parts and labor shall apply to all the equipment, except that the Company further agrees to warranty certain specified equipment for longer terms, as mutually agreed and stated in Exhibit I, Equipment Warranties. The Company further agrees to deliver to the County, for its inspection and approval, all such written warranties.

All warranties shall be transferable and extend to the County. The warranties shall specify that only new, and not reconditioned parts, may be used and installed when repair is necessary.

Notwithstanding the above, nothing in this Section shall be construed to alleviate/relieve the Company from complying with its obligations to perform under all terms and conditions of this Contract and as set forth in all attached Schedules.

Section 8.2 Labor Warranties.

The Company warrants that all work performed under this Contract complies with customary, reasonable and prudent standards of care in accordance with standards in the industry and are performed in a professional manner and consistent with any County supplied specifications and standards.

SECTION 9. INDEMNIFICATION AND LIMITATION OF LIABILITY

Section 9.1 Indemnification by Company.

The Company shall hold and save the County, the State of Florida, its officers, agents, and employees harmless against claims by third parties resulting from Company's breach of this Contract or the Company's negligence.

Section 9.2 Indemnification by the County.

Both Parties recognize that County is prohibited from entering into indemnification agreements. Subject to that prohibition, the Parties agree that the Company shall not be responsible for damages resulting solely and exclusively from the County's negligence.

Section 9.3 Limitation of Liability:

Neither Party shall be liable to another for special, indirect, consequential or punitive damages, even if the Party has been advised that such damages are possible. No Party shall be liable for lost profits, lost revenue, or lost operating savings. Notwithstanding the foregoing, nothing in this section will be construed to limit any of the remedies afforded to the under its administrative codes.

SECTION 10. OWNERSHIP

Section 10.1 Ownership of Certain Proprietary Property Rights.

The County shall not, by virtue of this Contract, acquire any interest in any formulas, patterns, devices, secret inventions or processes, copyrights, patents, other intellectual or proprietary rights, or similar items of property which are or may be used in connection with the CM. The Company shall grant to the County all rights for the duration of this Contract for any and all software or other intellectual property rights necessary for the County to continue to operate, maintain, and repair the CM in a manner that will yield maximal consumption reductions.

Section 10.2 Ownership of Existing Equipment.

Ownership of the equipment and materials presently existing at the Facilities at the time of execution of this Contract shall remain the property of the County even if it is replaced or its operation made unnecessary by work performed by the Company pursuant to this Contract. The Company shall be responsible for the disposal of all equipment and materials designated by the County as disposable off-site in accordance with all applicable laws and regulations regarding such disposal.

Section 10.3 Ownership of Installed Equipment; Risk of Loss.

Upon the issuance of a its acceptance of a CM Group, the County shall have all legal title to and ownership of all underlying equipment and Company shall take all actions necessary to vest such title and ownership in the County. Prior to this date, the risk of loss or damage to all items shall be the responsibility of the Company, unless loss or damage results from negligence by the County, and the Company shall be responsible for filing, processing and collecting all damage claims.

Section 10.4 Patent and Copyright.

The Company, without exception, shall indemnify and save harmless the County and its employees from liability of any nature or kind, including cost and expenses for or on account of any copyrighted, patented, or unpatented invention, process or article supplied by the Company. The Company has no liability when such claim is solely and exclusively due to the combination, operation or use of any article supplied hereunder with equipment or data not supplied by the Company or is based solely and exclusively upon the County's alteration of the article. The County will provide prompt written notification of a claim of copyright or patent infringement and will afford the Company full opportunity to defend the action and control the defense. Further, if such a claim is made or is pending the Company may, at its options and expenses procure for the County the right to continue use of, replace or modify the article to render it non-infringing. (If none of the alternatives are reasonably available, the County agrees to return the article on request to the Company and receive reimbursement, if any, as may be determined by a court of competent jurisdiction.) If the Company uses any design, device, or materials covered by letters, patent or copyright, it is mutually agreed and understood without exception that the negotiated prices shall include all royalties or costs arising from the use of such design, device, or materials in any way involved in the work.

SECTION 11. FACILITIES MAINTENANCE AND EQUIPMENT SERVICES

Section 11.1 Maintenance Procedures.

The County agrees that it shall adhere to, follow and implement the maintenance procedures and methods of operation recommended in the equipment manufacturers' Maintenance Manuals, common and recommended industry practices, and any other mutually agreed maintenance procedures.

Section 11.2 Changes to CMs and Facilities by County.

To the extent the Company might be responsible for maintenance of equipment the County shall not move, remove, modify, alter, or change in any way the CMs or any part thereof without the prior written approval of the Company, which consent shall not be unreasonably withheld. Notwithstanding the foregoing, County may take reasonable steps to protect a CM if, due to an emergency, it is not possible or reasonable to notify Company before taking any such actions. In the event of such an emergency, the County shall take reasonable steps to protect the CM from damage or injury and shall follow instructions for emergency action provided in advance by the Company. The County agrees to maintain the Facilities in good repair and to protect and preserve all portions thereof that may in any way affect the operation or maintenance of the CM. If the Company contends that the County is not performing its maintenance responsibilities or that the County has made any other material changes, including a change in manner of use, hours of operation for the equipment, permanent changes in the comfort and service parameters, occupancy or structure of the Facilities, types and quantities of equipment at the Facilities, then the Company shall submit a report to the County, upon which the County and Company shall mutually agree on what, if any, adjustments to the Baseline are to be made.

Section 11.3 Changes to CMs by the Company.

Notwithstanding anything to the contrary in this Contract or elsewhere, the Company shall at all times have the right, subject to County's prior written approval, which

approval shall not be unreasonably withheld, to change the CM, revise any procedures for the operation of the equipment or implement other saving actions in the Facilities, provided that (i) such modifications or additions to, or replacement of the CM, and any operational changes, or new procedures are necessary to enable the Company to achieve the savings at the Facilities (ii) The County operations are not unfavorably affected, and; (iii) any cost incurred relative to such modifications, additions or replacement of the CM, or operational changes or new procedures shall be the responsibility of the Company. All modifications, additions or replacements of the CM or revisions to operating or other procedures shall be made by written amendment to this Contract pursuant to § 255.258 Florida Statutes.

SECTION 12. PROPERTY/CASUALTY INSURANCE

Section 12.1 Insurance.

At all times during the Term, the Company shall maintain in full force and effect all insurance coverages customary for companies in it its industry of comparable size, including: (1) Workmen's Compensation Insurance sufficient to cover all of the employees of Company working to fulfill this Contract, and (2) Casualty and Liability Insurance on the CMs Contractor delivers and Liability Insurance for its employees and the possession, operation, and service of the underlying equipment. The limits of such insurance shall be not less than those established by the County's Risk Management Department for the type of type and size of the work.

Prior to commencement of work under this Contract, the Company will be required to provide the County with current certificates of insurance specified above. These certificates shall contain a provision that coverages afforded under the policies will not be canceled or changed until at least thirty (30) days' prior written notice has been given to County.

The policies for Bodily Injury and Property Damage Liability Insurance shall be written to include Contractual Liability Insurance to protect Company against claims from the operations of subcontractors. Certificates of Company's insurance containing evidence of the Hold Harmless Clause protecting the County shall be filed with the County and shall be subject to its approval for adequacy of protection.

Section 12.2 Damage.

The Company shall be responsible for (i) any damage to the equipment to be installed or to any other property on the Facilities and (ii) any personal injury where such damage or injury occurs as a result of the Company's performance under this Contract, but only to the extent caused by the acts or omissions of Company

SECTION 13. BOND

Section 13.1

The County shall be provided with the following bonds, within 30 days of the date of this Contract:
(a) Construction Bond: The Company shall furnish a Construction Bond, for the full cost of the project. The Construction Bond shall remain in effect until the CM is accepted by the County.

Section 13.2 Bond Provisions.

The following provisions shall apply to the bonds in this Section:
(a) The County shall be named as the beneficiary of the bonds. The bonds shall provide that the insurer or bonding company shall pay losses suffered by the County directly to the County. The Company or its insurer shall provide the County thirty (30) days prior written notice that the bond(s) has been renewed together and of any attempt to cancel or to make any other material changes in the status, coverage or scope of the required bond or of Company's failure to pay bond premiums. The cost of bonds shall be reflected as a project cost and included in the Conservation Measures to be installed.
(b) Company shall follow § 255.05 "Bond of contractor constructing public buildings; form; action by materialmen" of the Florida Statutes.
(c) No payments shall be made to the Company until the bond is in place as per § 255.05 Florida Statutes.
(d) To be acceptable to the County as surety for performance bonds, the surety company shall:

(i) Have a currently valid Certificate of Authority, issued by the State of Florida, Department of Financial Services, authorizing it to write surety bonds in the State of Florida

(ii) Have a currently valid Certificate of Authority issued by the United States Department of Treasury under Sections 9304 to 9308 of Title 31 of the United States Code.

(iii) Be in full compliance with the provisions of the Florida Insurance Code

(iv) Have a minimum Best's Policyholder Rating of A- or Performance Index Rating of VI from Best's Key Rating Guide.

SECTION 14. EVENTS OF DEFAULT

Section 14.1

The following are events of default under this Contract:

(a) Any failure by either Party to pay any payment required to be paid when due. A County's failure to pay for reason of Non-Appropriation shall not constitute an event of default, and shall be governed by Section 6 of this Contract.

(b) Any failure by either Party to observe and perform any material covenant, condition or agreement on its part to be observed or performed hereunder or under this Contract, other than as referred to in Clause (a) of this Section.

(c) The Company initiates a proceeding in any court, seeking liquidation, reorganization, debt arrangement, dissolution, winding up, appointment of trustee, receiver, custodian, or the like for substantially all of its assets, and such proceeding continues undismissed, unstayed and in effect for a period of 60 consecutive days; or an order for relief is entered in an involuntary case under the federal bankruptcy laws or other similar laws now or hereafter in effect.

SECTION 15. REMEDIES UPON DEFAULT

Section 15.1 Opportunity to Cure Defaults.

Each Party shall have a period of forty (40) days after being notified of an event of default to cure said default, provided that the Party has not already failed to cure a default under the terms of this Contract.

Section 15.2 Remedies upon Default by the County.

If a default by the County is not cured in accordance with Section 15.1, the Company may, without a waiver of other remedies which exist in law or equity, exercise all remedies available at law or in equity or other appropriate proceedings including bringing an action or actions from time to time for recovery of amounts due and unpaid by the County, and/or for damages which shall include all costs and expenses reasonably incurred in exercise of its remedy.

Section 15.2 Remedies Upon Default by the Company.

If a default by the Company is not cured in accordance with Section 15.1, the County shall have the following remedies in law or equity:

(a) The County may exercise any and all remedies at law or equity, or institute other proceedings, including, without limitation, bringing an action or actions from time to time for specific performance, and/or for the recovery of amounts due and unpaid and/or for damages, which shall include all costs and expenses reasonably incurred in exercise of its remedy,

(b) The County may take any and all steps necessary to cure the Company's default including the hiring or contracting of third parties to fulfill Company's obligations. In the event the County takes any action to effect such cure, the Company shall be obligated to reimburse the County for its costs and expenses, pursuant to any applicable County organizational procedures.

SECTION 16. ASSIGNMENT

Section 16.1 Assignment by the Company.

The Company acknowledges that the County is induced to enter into this Contract by, among other things, the professional qualifications of the Company. The Company agrees that neither this Contract nor any right or obligations hereunder may be assigned in whole or in part to another firm, without the prior written approval of the County; provided the Company can, without prior approval from the County, assign this Contract to it's parent or affiliate companies.

The Company may, with prior written approval of the County, which consent shall not be unreasonably withheld, delegate its duties and performance under this Contract, and/or utilize subcontractors, provided that any assignee(s), delegee(s), or subcontractor(s) shall fully comply with the terms of this Contract. Notwithstanding the provisions of this paragraph, Company shall remain jointly and severally liable with its assignees(s), or transferee(s) to the County for all of its obligations under this Contract.

Section 16.2 Assignment by the County.

The County may transfer or assign this Contract and its rights and obligations herein to a successor or purchaser of the Facilities or an interest therein subject to the prior written approval of Company. If the Company rejects new assignee, the County will continue to make the payments associated with the facility or the County can pay the remaining principal on the loan for the equipment installed in that facility. Notwithstanding the foregoing, the County's rights and responsibilities may be transferred in the event that the agency/department that originally executed this Contract is transferred, moved or absorbed by another governmental entity to such succeeding entity.

SECTION 17. ARBITRATION

Any dispute, controversy, or claim arising out of or in connection with, or relating to this Contract, or any breach or alleged breach hereof, may, upon the agreement of both Parties, be submitted to and settled by arbitration in the State of Florida, in conformance with the rules of the American Arbitration Association then in effect for commercial disputes (or at any other place or under any other form of arbitration mutually acceptable to the Parties).

The expenses of the arbitration shall be borne equally by the Parties to the arbitration, provided that each Party shall pay for and bear the cost of its own experts, evidence, and counsel.

SECTION 18. REPRESENTATIONS AND WARRANTIES

Section 18.1 Mutual Representations.

Each Party warrants and represents to the other that:

(a) it has all requisite power, authority, licenses, permits, and franchises, corporate or otherwise, to execute and deliver this Contract and perform its obligations hereunder;
(b) its execution, delivery, and performance of this Contract have been duly authorized by, or are in accordance with, its organic instruments, and this Contract has been duly executed and delivered for it by the signatories so authorized, and it constitutes its legal, valid, and binding obligation;

(c) its execution, delivery, and performance of this Contract will not breach or violate, or constitute a default under any Contract, lease or instrument to which it is a party or by which it or its properties may be bound or affected; or

(d) it has not received any notice, nor to the best of its knowledge is there pending or threatened any notice, of any violation of any applicable laws, ordinances, regulations, rules, decrees, awards, permits or orders which would materially and adversely affect its ability to perform hereunder.

Section 18.2 County Representations.

The County hereby warrants and represents that:

(a) it has provided or shall provide timely to the Company, all records relating to energy usage and energy related maintenance of the Facilities requested by the Company and the information set forth therein is, and all information in other records to be subsequently provided pursuant to this Contract will be true and accurate in all material respects; and

(b) it has not entered into any leases, contracts or agreements with other persons or entities regarding the leasing of efficiency equipment or the provision of energy management services for the Facilities or with regard to servicing any of the related equipment located in the Facilities except as disclosed to the Company.

Section 18.3 Company Representations.

Company hereby warrants and represents that:

(a) before commencing performance of this Contract it shall have (i) become licensed or otherwise permitted to do business in the State of Florida, and (ii) provided proof and documentation of required insurance pursuant to Section 12, and (iii) made available, upon reasonable request, all documents relating to its performance under this Contract, including all contracts and subcontracts entered into;

(b) it shall use qualified subcontractors and delegees, licensed and bonded in this state to perform the work so subcontracted or delegated pursuant to the terms hereof;

(c) it is financially solvent, able to pay its debts as they mature and possessed of sufficient working capital to perform its obligations under this Contract.

SECTION 19. MISCELLANEOUS

Section 19.1 Waiver of Liens.

The Company will obtain and furnish to the County a Waiver of Liens from each vendor, material manufacturer and laborer in the supply, installation and servicing of each CM. Should liens or claims be filed against the Facilities by reason of the Company's acts or omissions, the Company shall cause same to be discharged by bond or otherwise within ten (10) days after filing.

Section 19.2 Compliance with Law and Standard Practices.

The Company shall perform its obligations in compliance with any applicable Federal, State and Local laws and regulations in accordance with sound Engineering and Safety practices, and in compliance with any County safety rules and practices. Upon discovery of the suspected or real presence of asbestos, and in determining the need by the Company of disturbing such asbestos as part of the Work, the Company shall immediately notify the County of such discovery. The County will quickly endeavor to identify and, if necessary, remove asbestos, following the County's established procedure, to the extent necessary for the Company to safely perform its work, or to a further extent if the County deems necessary or preferable..

The Company shall not use, store, dispose of or otherwise handle any Hazardous Substance (as defined in 42 U.S.C. Sections 9601, 9603, 6921, 7412, 49 U.S.C. Sections 1802 and 33 U.S.C. Sections 1321 and 1317 as now or hereinafter amended) or Hazardous Material in or on the Facilities except in a lawful manner and so as not to cause County any cost, loss, obligation or liability or expose County to any claim or suit with respect to same. "Hazardous Materials" shall mean petroleum, or any fraction thereof, asbestos, polychlorinated biphenyls, or any other substance identified either as a "hazardous substance", "hazardous waste", "pollutant", "contaminant" or other similar term in any applicable federal, state or local law or regulation, as such law or regulations may be now or hereafter amended.

Section 19.3 Independent Capacity of Company.

The Parties agree that the Company, and any agents and employees of the Company, in the performance of this Contract, shall act in an independent capacity and not as officers, employees, or agents of the County.

Section 19.4 No Waiver.

The failure of the Company or the County to insist upon the strict performance of the terms and conditions hereof shall not constitute or be construed as a waiver or relinquishment of either Party's right to thereafter enforce the same in accordance with this Contract in the event of a continuing or subsequent default on the part of the Company or the County.

Section 19.5 Severability.

In the event that any clause or provision of this Contract or any part thereof shall be declared invalid, void, or unenforceable by any court having jurisdiction, such invalidity shall not affect the validity or enforceability of the remaining portions of this Contract unless the result would be manifestly inequitable or unconscionable.

Section 19.6 Complete Contract.

This Contract, including all Schedules, Exhibits and Appendices attached hereto, when executed, shall constitute the entire Contract between both Parties. Contract may not be amended, modified, or terminated except by a written Contract signed by the Parties.

Section 19.7 Further Documents.

The Parties shall execute and deliver all documents and perform all further acts that may be reasonably necessary to effectuate the provisions of this Contract.

Section 19.8 Applicable Law.

This Contract and the construction and enforceability thereof shall be interpreted under the laws of the State of Florida.

Section 19.9 Notice.

Any notice required or permitted hereunder shall be deemed sufficient if given in writing and delivered personally or sent by registered or certified mail, return receipt requested, or delivered to a nationally recognized express mail service, postage prepaid to the address shown below or to such other persons or addresses as are specified by similar notice. The County's Contract Manager for this project will serve as liaison for the

ongoing administration of this Contract and the resolution of any problems related thereto.

TO COMPANY: Manny Rodriguez
Regional Sales Manager
FPL Services
9250 West Flagler
Miami, Florida, 33174

TO COUNTY: Reinaldo Abrahante
Engineer 3
General Services Administration
Facilities and Utilities Management Division
200 NW 1st Street
Miami, Florida, 33128

Section 19.10 Statutory Notices and Requirements.

The County shall consider the employment by any Company of unauthorized aliens a violation of Section 274A(e) of the Immigration and Nationality Act. Such violation shall be cause for unilateral cancellation of this Contract. An entity or affiliate who has been placed on the public entity crimes list or the discriminatory vendor list may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a company, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity pursuant to limitations under Chapter 287 Florida Statutes.

Wage rates and other factual unit costs supporting the compensation are accurate, complete, and current at the time of contracting. The original contract price and any additions thereto will be adjusted to exclude any significant sums by which the County determines the contract price was increased due to inaccurate, incomplete, or noncurrent wage rates and other factual unit costs. All such contract adjustments must be made within 1 year following the end of this Contract.

The Company warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the Company to solicit or secure this Contract and that it has not paid or agreed to pay any person, company, corporation, individual, or firm, other than a bona fide employee working solely for the Company any fee, commission, percentage, gift, or other consideration contingent upon or resulting from the award or making of this Contract. For the breach or violation of this provision, County shall have the right to terminate this Contract without liability and, at its discretion, to deduct from the contract price, or otherwise recover, the full amount of such fee, commission, percentage, gift, or consideration.

Section 19.11 Public Records.

The County shall have the right of unilateral cancellation for refusal by Company to allow public access to all documents, papers, letters, or other material subject to the provisions of Chapter 119, Florida Statutes and made or received by Company in conjunction with this Contract.

Section 19.12 Force Majeure.

Neither Party will be liable for any default or delay in the performance of its obligations under this Contract to the extent such default or delay is caused by fire, flood, earthquake, elements of nature or acts of God; riots, civil disorders, rebellions or revolutions in the United States; injunctions (provided the injunction was not issued as a result of any fault or negligence of the party seeking to have its default or delay excused); or any other cause beyond the reasonable control of such party ("Force Majeure Events"); provided the non-performing party and its subcontractors are without fault in causing such default or delay, and such default or delay could not have been prevented by reasonable precautions and cannot reasonably be circumvented by the non-performing party through the use of alternate sources, workaround plans or other means, including disaster recovery plans. Performance times shall be considered extended for a period of time equivalent to the time lost because of any such delay, provided that in the event the Company is delayed in its performance by reason of such cause, no such extension shall be made unless notice thereof is presented by the Company to the County in writing within ten (10) business days after the start of the occurrence of such delay, no payment shall be made by the County for any fees or expenses incurred by the Company by reason of such delay, and the Company shall use best efforts to perform its obligations during such period of delay, and notify the County of its abatement or cessation.

IN WITNESS WHEREOF, and intending to be legally bound, the Parties hereto subscribe their names to this Contract by their duly authorized officers on the date last executed below

COMPANY:	**COUNTY:**
By: _____ [Signature]	By: _____ [Signature]
Title: VP & General Manager (Corporate Seal)	Title: _____
Date: 6/8/09	Date: _____

Schedule A
Equipment to Be Installed by Company

ECM - 1: Energy Efficient Lighting

MIA Terminal A

Number of fixtures identified: 2,841
Number of fixtures included: 2,272
As follows:

- Lamp for Lamp retrofit of 2' T12/Magnetic Ballast systems with Sylvania T8 F017/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 3' T12/Magnetic Ballast systems with Sylvania T8 F025/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing MV HID down light fixtures using magnetic ballast in 2x2 ceiling grid with Lithonia 2RT5 fixture using Sylvania 24W T5HO lamps and Sylvania Multi-volt Series (<10% THD) electronic HO ballast.

- Retrofit of existing MV HID surface mounted fixtures using magnetic ballast with pulse start metal halide lamps and electronic ballast.

- Tandem Wire retrofit of existing fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast. By tandem wiring contiguous fixtures, the number of ballast in operation is cut in half.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 23W screw in self ballast compact fluorescents.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Terminal A Exclusions:

- Compact fluorescent edge lit exit signs.
- Existing LED exit signs.
- Recessed fixtures containing (2) 26W compact fluorescent lamps.
- Recessed fixtures containing (1) 26W compact fluorescent lamp.
- Surface mounted fixtures containing (1) 9W compact fluorescent lamp.
- Linear fluorescent fixtures with existing T8 lamps and electronic ballasts with dimming capabilities.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

MIA Terminal B

Number of fixtures identified: 1,197
Number of fixtures included: 1,085
As follows:

- Lamp for Lamp retrofit of 2' T12/Magnetic Ballast systems with Sylvania T8 F017/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 3' T12/Magnetic Ballast systems with Sylvania T8 F025/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of U-lamps T12/Magnetic Ballast systems with Sylvania T8 FB032/841/6/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing MV HID down light fixtures using magnetic ballast in 2x2 ceiling grid with Lithonia 2RT5 fixture using Sylvania 24W T5HO lamps and Sylvania Multi-volt Series (<10% THD) electronic HO ballast.

- Retrofit of existing MV HID surface mounted fixtures using magnetic ballast with pulse start metal halide lamps and electronic ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Terminal B Exclusions:

- Compact fluorescent edge lit exit signs.
- Existing LED exit signs.
- Recessed fixtures containing (2) 26W compact fluorescent lamps.
- Recessed fixtures containing (2) 13W compact fluorescent lamps.
- Recessed fixtures containing (2) 18W compact fluorescent lamps.
- Surface mounted fixtures containing (1) 7W compact fluorescent lamp.
- Incandescent fixtures with dimming capabilities.
- Areas that are currently under renovation or under construction.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

MIA Terminal C

Number of fixtures identified: 376
Number of fixtures included: 359
As follows:

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Terminal C Exclusions:

- Compact fluorescent edge lit exit signs.
- Existing LED exit signs.
- Recessed fixtures containing (1) 18W compact fluorescent lamp.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

MIA Terminal E

Number of fixtures identified: 3,368
Number of fixtures included: 3,265
As follows:

- Lamp for Lamp retrofit of 3' T12/Magnetic Ballast systems with Sylvania T8 F025/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of U-lamps T12/Magnetic Ballast systems with Sylvania T8 FB032/841/6/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing MV HID down light fixtures using magnetic ballast in 2x2 ceiling grid with Lithonia 2RT5 fixture using Sylvania 24W T5HO lamps and Sylvania Multi-volt Series (<10% THD) electronic HO ballast.

- Replacement of existing HPS & MV HID down light fixtures using magnetic ballast with an induction fixture using a Sylvania 100W Icetron lamp and Sylvania electronic induction ballast.

- Retrofit of existing MV HID surface mounted fixtures using magnetic ballast with pulse start metal halide lamps and electronic ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Install photoelectric cells for day lighting control in specified fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.
- Lamp to lamp replacement of existing 40W incandescent lamps with 14W screw in self ballast compact fluorescents.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Terminal E Exclusions:

- Compact fluorescent edge lit exit signs.
- Existing LED exit signs.
- Recessed fixtures containing (2) 18W compact fluorescent lamps.
- Incandescent fixtures with dimming capabilities.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

MIA Concourse E

Number of fixtures identified: 2,509
Number of fixtures included: 2,322
As follows:

- Lamp for Lamp retrofit of 2' T12/Magnetic Ballast systems with Sylvania T8 F017/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 3' T12/Magnetic Ballast systems with Sylvania T8 F025/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of U-lamps T12/Magnetic Ballast systems with Sylvania T8 FB032/841/6/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing MV HID down light fixtures using magnetic ballast in 2x2 ceiling grid with Lithonia 2RT5 fixture using Sylvania 24W T5HO lamps and Sylvania Multi-volt Series (<10% THD) electronic HO ballast.

- Replacement of existing HPS & MV HID down light fixtures using magnetic ballast with an induction fixture using a Sylvania 100W Icetron lamp and Sylvania electronic induction ballast.

- Retrofit of existing MV HID surface mounted fixtures using magnetic ballast with pulse start metal halide lamps and electronic ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Concourse E Exclusions:

- Recessed fixtures containing (2) 18W compact fluorescent lamps.
- Recessed fixtures containing (1) 13W compact fluorescent lamp.
- Recessed fixtures containing HPS lamps and magnetic ballasts.
- Areas that are currently under renovation or under construction. Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

MIA Satellite E

Number of fixtures identified: 2,287
Number of fixtures included: 2,206
As follows:

- Lamp for Lamp retrofit of 2′ T12/Magnetic Ballast systems with Sylvania T8 F017/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 3′ T12/Magnetic Ballast systems with Sylvania T8 F025/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 4′ T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of U-lamps T12/Magnetic Ballast systems with Sylvania T8 FB032/841/6/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing MV HID down light fixtures using magnetic ballast in 2x2 ceiling grid with Lithonia 2RT5 fixture using Sylvania 24W T5HO lamps and Sylvania Multi-volt Series (<10% THD) electronic HO ballast.

- Replacement of existing compact fluorescent & MV HID down light fixtures using magnetic ballast in hard ceiling with Lithonia 2RT5X fixture using Sylvania 14W T5 lamps and Sylvania Multi-volt Series (<10% THD) electronic T5 ballast.

- Replacement of existing HPS & MV HID down light fixtures using magnetic ballast with an induction fixture using a Sylvania 100W Icetron lamp and Sylvania electronic induction ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replacing 8' fixture using 2 F96 T12 lamps and magnetic ballast with 8' strip fixture using 2 54W T5HO lamps and electronic ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Satellite E Exclusions:

- Existing LED exit signs.
- Recessed fixtures containing (2) 18W compact fluorescent lamps.
- Incandescent fixtures with dimming capabilities.
- Areas that are currently under renovation, abandoned, or under construction.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

MIA Terminal F

Number of fixtures identified: 312
Number of fixtures included: 275
As follows:

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing HPS & MV HID down light fixtures using magnetic ballast with an induction fixture using a Sylvania 100W Icetron lamp and Sylvania electronic induction ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Terminal F Exclusions:

- Existing LED exit signs.
- Exterior recessed fixtures containing HPS lamps and magnetic ballasts.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

MIA Concourse F

Number of fixtures identified: 2,130
Number of fixtures included: 2,016
As follows:

- Lamp for Lamp retrofit of 2' T12/Magnetic Ballast systems with Sylvania T8 F017/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 3' T12/Magnetic Ballast systems with Sylvania T8 F025/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of U-lamps T12/Magnetic Ballast systems with Sylvania T8 FB032/841/6/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing MV HID down light fixtures using magnetic ballast in 2x2 ceiling grid with Lithonia 2RT5 fixture using Sylvania 24W T5HO lamps and Sylvania Multi-volt Series (<10% THD) electronic HO ballast.

- Replacement of existing HPS & MV HID down light fixtures using magnetic ballast with an induction fixture using a Sylvania 100W Icetron lamp and Sylvania electronic induction ballast.

- Retrofit of existing MV HID surface mounted fixtures using magnetic ballast with pulse start metal halide lamps and electronic ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace incandescent surface mounted fixtures with surface mounted fixtures using (2) 13W compact fluorescent lamps and electronic ballast.

- Install photoelectric cells for day lighting control in specified fixtures.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Concourse F Exclusions:

- Existing LED exit signs.
- Recessed fixtures containing (2) 18W compact fluorescent lamps.
- Recessed fixtures containing (2) 13W compact fluorescent lamps.
- Recessed fixtures containing HPS lamps and magnetic ballasts.
- Surface mounted wall pack fixtures containing HPS lamps and magnetic ballasts.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

MIA Terminal G

Number of fixtures identified: 355
Number of fixtures included: 349
As follows:

- Lamp for Lamp retrofit of 4′ T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing HPS & MV HID down light fixtures using magnetic ballast with an induction fixture using a Sylvania 100W Icetron lamp and Sylvania electronic induction ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.

- Recessed fixtures containing (1) 13W compact fluorescent lamp.

- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

Concourse G

Number of fixtures identified: 866
Number of fixtures included: 855
As follows:

- Lamp for Lamp retrofit of 2' T12/Magnetic Ballast systems with Sylvania T8 F017/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 3' T12/Magnetic Ballast systems with Sylvania T8 F025/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of U-lamps T12/Magnetic Ballast systems with Sylvania T8 FB032/841/6/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing MV HID down light fixtures using magnetic ballast in 2x2 ceiling grid with Lithonia 2RT5 fixture using Sylvania 24W T5HO lamps and Sylvania Multi-volt Series (<10% THD) electronic HO ballast.

- Replacement of existing HPS & MV HID down light fixtures using magnetic ballast with an induction fixture using a Sylvania 100W Icetron lamp and Sylvania electronic induction ballast.

- Retrofit of existing MV HID surface mounted fixtures using magnetic ballast with pulse start metal halide lamps and electronic ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace incandescent surface mounted fixtures with surface mounted fixtures using (2) 13W compact fluorescent lamps and electronic ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Concourse G Exclusions:

- Existing LED exit signs.
- Recessed fixtures containing (2) 26W compact fluorescent lamps.
- Surface mounted flood fixtures containing HPS lamps and magnetic ballasts.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

Terminal H

Number of fixtures identified: 115
Number of fixtures included: 115
As follows:

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.

Terminal H Exclusions:

- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

Concourse H

Number of fixtures identified: 1,037
Number of fixtures included: 978
As follows:

- Lamp for Lamp retrofit of 2' T12/Magnetic Ballast systems with Sylvania T8 F017/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of 4' T12/Magnetic Ballast systems with Sylvania T8 F032/841/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Lamp for Lamp retrofit of U-lamps T12/Magnetic Ballast systems with Sylvania T8 FB032/841/6/XPS/ECO fluorescent lamps and Sylvania Multi-volt Series (<10% THD) Electronic ballast QHE/x32T8 UNV ISLC Ballast.

- Replacement of existing MV HID down light fixtures using magnetic ballast in 2x2 ceiling grid with Lithonia 2RT5 fixture using Sylvania 24W T5HO lamps and Sylvania Multi-volt Series (<10% THD) electronic HO ballast.

- Replacement of existing HPS & MV HID down light fixtures using magnetic ballast with an induction fixture using a Sylvania 100W Icetron lamp and Sylvania electronic induction ballast.

- Retrofit of existing MV HID surface mounted fixtures using magnetic ballast with pulse start metal halide lamps and electronic ballast.

- Replace existing non-functioning fixtures containing T12/Magnetic Ballast combinations with Sylvania T8 Lamps 841 series and Sylvania Multi-volt Series (<10% THD) QHE/x32T8 UNV ISLC Electronic Ballast.

- Replace incandescent surface mounted fixtures with surface mounted fixtures using (2) 13W compact fluorescent lamps and electronic ballast.

- Replace existing standard wall switches in specified mechanical rooms with spring wound time switches.

- Lamp for lamp replacement of existing T12 tube guards with new T8 tube guards in existing fixtures.

- Lamp to lamp replacement of existing 60/100W incandescent lamps with 19W screw in self ballast compact fluorescents.

- Replacement of Incandescent and Fluorescent Exit Signs with LED Exits Signs.

Concourse H Exclusions:

- Existing LED exit signs.
- Recessed fixtures containing (2) 26W compact fluorescent lamps.
- Recessed fixtures containing (2) 18W compact fluorescent lamps.
- Surface mounted flood fixtures containing HPS lamps and magnetic ballasts.
- Recessed fixtures containing HPS lamps and magnetic ballasts.
- Recessed fixtures containing MH lamps and magnetic ballasts.
- Code repairs of electrical panels, junction boxes, conduits, ceiling grid/support that are not touched or modified (note: when a new fixture, other than the replacement fixture, is added, the area affected will be included).

Schedule B
Description Of Facilities

The background data used in the development of this study is based on a thorough survey of the facilities, interviews with on-site staff, actual load data and analysis of historical utility consumption. Equipment and system data were obtained through a combination of recording of nameplates, metering devices, physical observations and drawings/schedules.

General Information and Background

MIA was opened to flights in 1928 as Pan American Field, the operating base of Pan American Airways Corporation, on the north side of the modern airport property. After Pan Am acquired the New York, Rio, and Buenos Aires Line, it shifted most of its operations to the Dinner Key seaplane base, leaving Pan Am Field largely unused until Eastern Airlines began flying there in 1934, followed by National Airlines in 1937.

In 1945, the City of Miami established a Port Authority and raised bond revenue to purchase the airport, now known as 36th Street Airport, from Pan Am. It was merged with an adjoining Army airfield in 1949 and expanded further in1951. The old terminal on 36th Street was closed in 1959 when the modern passenger terminal (since greatly expanded) opened for service. Today, MIA ranks first in international air freight and third in international passenger traffic, among U.S. airports.

The main terminal at MIA is semicircular and has seven pier-shaped concourses, lettered A through H (B and C have been demolished as part of the on going North Terminal Expansion) in a counter-clockwise direction. Ticketing and departures are located on the upper level: immigration and baggage carousels are located on the lower level. Concourse E has a third-floor people mover that transports passengers to a satellite terminal.

The parking garages are located inside the terminal's curvature, and are connected to the terminal by overhead walkways.

At present, the terminal is being dramatically altered via the Airport's Capital Improvement Program (CIP). Through this program, the terminal and concourse areas on the north and south sides are being dramatically enlarged with the addition of over 3 million square feet and greatly increasing the number of aircraft gates. The Concourses A, B, C, and D, which primarily house American's flights, are being transformed into a single linear concourse. The A-D concourses are commonly referred to as the North Terminal. The other new area is referred to as the South Terminal. This consists of new terminal space east of the existing Terminal H area and a new Concourse J.

The remaining area, Terminal E through H, and Concourses E through H (including Satellite E) currently are not part of the CIP. As a result, there is a need to investigate energy conservation opportunities.

On 5/16/07, a meeting was held between MDAD, FPLS and the North Terminal Development (NTD) representatives. In this meeting the NTD representatives identified portions within the A-D area that they are not renovating. This included parts of the second, third and fourth floors, which have sections on the upper floors that have yet to be defined. As a result, after the NTD representatives departed, FPLS and MDAD discussed the concept of a Phase 2 project.

Phase 2 would then consist of the areas that remain, such as the Customs/Sterile areas, the non-renovated areas within A-D and the applicable first floor areas of the Concourses located in:

1. **Terminal A**
2. **Terminal B**
3. **Terminal C**
4. **Terminal E**
5. **Terminal F**
6. **Terminal G**
7. **Terminal H**
8. **Concourse E**
9. **Satellite E**
10. **Concourse F**
11. **Concourse G**
12. **Concourse H**

Note: Excluded were areas of the new South terminal and Concourse J.

Lighting

From the site visits, it was determined that the lighting is composed of the following fixture types:

Note: The T-12 Fluorescent lamps are 34 Watts unless otherwise identified. The T-8 Fluorescent lamps are 32 Watts unless otherwise identified.

Qty.	Terminal A - Fixture Description
4	2'- 2 Lamp Cross Louver Fixture (With T8 Lamps And Magnetic Ballast)
2	2'- 2 Narrow Troffer With T8
9	2'- 2 Lamp Strip Fixture
12	3'-2 Lamp Cross Louver
20	3'-2 Lamp Cross Louver (T8 Lamps And Magnetic Ballast)
2	3'-2 Lamp Recessed Troffer (1x3)
15	3'-2 Lamp Recessed Troffer (1x3) (With T8's Existing Magnetic Ballast)
21	3'-2 Lamp Strip Fixture
1	4'-1 Lamp Recessed Troffer (1x4) (With T8's Existing)
122	4'-1 Lamp Strip Fixture (With T8's Existing)
228	4'- 2 Lamp Cross Louver Fixture With Up Lighting (Existing T8 Lamps & Magnetic Ballast)
13	4'- 2 Lamp Narrow Troffer Fixture (Existing T8 Lamps & Magnetic Ballast)
25	4'- 2 Lamp Recessed Troffer (2x4) (With T8's Existing)
3	4'- 2 Lamp Strip Fixture
15	4'- 2 Lamp Strip Fixture (With T8's Existing)
32	4'- 2 Lamp Strip Fixture With Existing T8 Lamps & Magnetic Ballast
6	4'- 2 Lamp Strip Fixture (With T8's & Wire Guard Existing)
2	4' 3 Lamp Recessed Troffer
62	4'- 3 Lamp Recessed Troffer (With T8's Existing)
560	4'- 3 Lamp Recessed Troffer (T8 Lamps & Magnetic Ballast)
1	8'- 2 Lamp (8' Lamps) Strip Fixture
6	Flood Fixture W/ 1-120 Watt Lamp
1112	Recess Can Fixture With 100 Watt Mercury Vapor Lamp
16	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
6	Recess Can W/ 175 Watt Mercury Vapor Lamp
71	Recess Can W/ 1-26 Watt Compact Fluorescent Lamp
117	Recess Can W/ 2-26 Watt Compact Fluorescent Lamp
11	Recess Can W/ 2-26 Watt Compact Fluorescent Lamp (Structural Ceiling)
42	Recessed Square Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling Mounted)

Qty.	Terminal A - Fixture Description
14	Recessed Square Fixture With 175 Watt Mercury Vapor Lamp (Structural Ceiling)
6	Surface Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
155	Surface Can W/ 9 Watt Compact Fluorescent
10	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
48	Exit Sign W/ 2-F6T5 Lamps (Edge Lit)
20	Exit Sign W/ Led Lamps
2,789	Terminal A Total

Qty.	Terminal B - Fixture Description
8	2'- 2 Lamp Strip Fixture
3	2'- 2 Lamp Strip Fixture (Existing T8 Lamps & Magnetic Ballast)
8	2'- 2 Lamp U6 Recess Troffer (2x2)
12	3'-2 Lamp Strip Fixture
18	4'-2 Lamp Industrial Shade (With T8's Existing)
5	4'- 2 Lamp Narrow Troffer Fixture (Existing T8 Lamps & Magnetic Ballast)
18	4'- 2 Lamp Recessed Troffer (2x4)
6	4'- 2 Lamp Recessed Troffer (2x4) (Missing Lens)
3	4'- 2 Lamp Recessed Troffer (2x4) (With T8's Existing)
242	4'- 2 Lamp Recessed Troffer (2x4) (With T8 Lamps & Magnetic Ballast)
5	4'- 2 Lamp Strip Fixture
20	4'- 2 Lamp Strip Fixture (With T8's Existing)
19	4'- 2 Lamp Strip Fixture (With Existing T8 Lamps & Magnetic Ballast)
8	4'- 2 Lamp Strip Fixture (With T8's & Wire Guard Existing)
16	4'- 2 Lamp Vanity Fixture
20	4'- 2 Lamp Vapor Tight Fixture
12	4'- 2 Lamp Wrap Fixture
33	4' 3 Lamp Recessed Troffer
74	4'- 3 Lamp Recessed Troffer (With T8's Existing)
231	4'- 3 Lamp Recessed Troffer (T8 Lamps & Magnetic Ballast)
8	4'- 4 Lamp Recessed Troffer (2x4)
3	4'- 4 Lamp Recessed Troffer (2x4) (Missing Lens)
21	4'- 4 Lamp Recessed Troffer (2x4) (With T8's Existing On Magnetic Ballast)
4	4'- 4 Lamp Wrap Fixture
12	8'- 4 Lamp (4' Lamps) Industrial Shade
6	8'- 4 Lamp (4' Lamp) Surface Box Fixture
2	7 Watt Compact Fluorescent Porcelain Based Fixture

Qty.	Terminal B - Fixture Description
57	Recess Can Fixture With 100 Watt Mercury Vapor Lamp
4	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
10	Recess Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling)
40	Recess Can W/ 2-13 Watt Compact Fluorescent Lamps
16	Recess Can W/ 2-18 Watt Compact Fluorescent Lamps
26	Recess Can W/ 2-26 Watt Compact Fluorescent Lamp
6	Recess Can W/ 2-26 Watt Compact Fluorescent Lamp (Structural Ceiling)
18	75 Watt Recess Can Fixture (Dimmer)
150	Recessed Square Fixture With 100 Watt Mercury Vapor Lamp
3	Recessed Square Fixture With 175 Watt Mercury Vapor Lamp
20	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
10	Exit Sign W/ 2-F6t5 Lamps (Edge Lit)
20	Exit Sign W/ Led Lamps
1,197	**Terminal B Total**

Qty.	Terminal C - Fixture Description
5	4'-2 Lamp Industrial Shade W/Tube Guards
10	4'- 2 Lamp Recessed Troffer (1x4)
77	4'- 2 Lamp Recessed Troffer (2x4)
2	4'- 2 Lamp Recessed Troffer (2x4) (With T8's Existing)
17	4'- 2 Lamp Recessed Troffer (2x4) (With T8 Lamps & Magnetic Ballast)
8	4'- 2 Lamp Surface Box
20	4'- 2 Lamp Vapor Tight Fixture
8	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
70	4' 3 Lamp Recessed Troffer
2	4'- 3 Lamp Recessed Troffer (With T8's Existing)
56	4'- 3 Lamp Recessed Troffer (T8 Lamps & Magnetic Ballast)
36	4'- 4 Lamp Recessed Troffer (2x4) (With T8's Existing On Magnetic Ballast)
4	8'- 4 Lamp (4' Lamps) Industrial Shade
1	8'- 4 Lamp (4' Lamp) Surface Box Fixture
1	8'- 4 Lamp (4' Lamp) Surface Box Fixture (With T8's Existing)
1	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
26	8' 2 Lamp (8' Lamps) Industrial Shade Fixture (Suspended)
1	Fixture With 100 Watt Mercury Vapor Lamp (Structural)
3	100 Watt Porcelain Based Fixture
2	Porcelain Based Fixture With 1-200 Watt Lamp
1	Recess Can W/ 1-18 Watt Compact Flourescent Lamp
9	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
14	Exit Sign W/ 2-F6t5 Lamps (Edge Lit)
2	Exit Sign W/ Led Lamps
376	Terminal C Total

Qty.	Terminal E - Fixture Description
115	2'- 1 Lamp U6 Recess Troffer (2x2)
312	2'- 2 Lamp U6 Recess Troffer (2x2)
2	2'- 2 Lamp U6 Recessed Troffer Fixture With T8 Lamps Existing
444	2'- 3 Lamp U3 Fixture With T8 Lamps Existing (Magnetic Ballast)
3	3'-1 Lamp Strip Fixture
16	4'-1 Lamp Cross Louver (Suspended) (Very Difficult)
8	4'-1 Lamp Cross Louver (With T8's Existing)
14	4'-1 Lamp Cross Louver (With T8's Existing) (Suspended)
491	4'- 1 Lamp Strip Fixture
25	4'- 1 Lamp Strip Fixture W/ Wire Guard
4	4'- 2 Lamp Industrial Shade With Existing T8 Lamps & Magnetic Ballast
9	4'-2 Lamp Industrial Shade W/Tube Guards
4	4'- 2 Lamp Recessed Troffer (1x4)
12	4'- 2 Lamp Narrow Troffer Fixture (Existing T8 Lamps & Magnetic Ballast)
51	4'- 2 Lamp Recessed Troffer (2x4)
4	4'- 2 Lamp Recessed Troffer (2x4) (With T8 Lamps & Magnetic Ballast)
14	4'- 2 Lamp Surface Box
4	4'- 2 Lamp Surface Box (Tamper Proof)
12	4'- 2 Lamp Strip Fixture
4	4'- 2 Lamp Strip Fixture (With T8's Existing)
1	4'- 2 Lamp Strip Fixture With Existing T8 Lamps & Magnetic Ballast
37	4'- 2 Lamp Vanity Fixture
4	4'- 2 Lamp Vapor Tight Fixture
9	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
15	4'- 2 Lamp Wrap Fixture
2	4'- 2 Lamp Wrap Fixture W/ Missing Lens
104	4' 3 Lamp Recessed Troffer
472	4'- 3 Lamp Recessed Troffer (T8 Lamps & Magnetic Ballast)
20	4'- 4 Lamp Recessed Troffer (2x4)
8	4'- 4 Lamp Recessed Troffer (2x4) (With T8's Existing)
6	4'- 4 Lamp Recessed Troffer (2x4) (With T8's Existing On Magnetic Ballast)
1	4'- 4 Lamp Wrap Fixture
1	8'- 2 Lamp (4' Lamps) Cross Louver With Up Lighting
49	8'- 2 Lamp (4' Lamps) Cross Louver With Up Lighting (Suspended) (Very Difficult)
33	8'-2 Lamp (4' Lamps) Strip Fixture
6	8'- 4 Lamp (4' Lamp) Narrow Troffered Fixture (With T8's Existing &

Qty.	Terminal E - Fixture Description
	Magnetic Ballast)
3	8'- 4 Lamp (4' Lamp) Strip Fixture
7	8'- 4 Lamp (4' Lamp) Strip Fixture (Suspended)
3	8'- 4 Lamp (4' Lamp) Strip Fixture (With T8's Existing)
13	8'- 4 Lamp (4' Lamp) Strip Fixture (With T8's Existing & Magnetic Ballast)
27	8'- 4 Lamp (4' Lamp) Strip Fixture With Wire Guards
3	8'- 4 Lamp (4' Lamp) Vapor Tight Fixture (Missing Lens)
13	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
3	8' 2 Lamp (8' Lamps) Industrial Shade Fixture (Suspended)
3	8'- 2 Lamp (8' Lamps) Strip Fixture
1	8'- 2 Lamp (8' Lamps) Strip Fixture (Very High Output Lamps)
3	8'- 2 Lamp (8' Lamps) Vapor Proof Fixture
56	Canopy Type Fixture With 150 Watt High Pressure Sodium Lamp
39	175 Watt Metal Halide Fixture
21	175 Watt Mercury Vapor Canopy Fixture
20	Canopy Fixture With 400 Watt High Pressure Sodium Lamp
23	High Intensity Discharge Fixture With 400 Watt Mercury Vapor Lamp Canopy Fixture
5	100 Watt Porcelain Based Fixture
2	Pendant Shade Fixture With 160 Watt Mercury Vapor Lamp
52	100 Watt Recessed Can
13	Recess Can Fixture With 100 Watt Mercury Vapor Lamp
29	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
10	120 Watt Recessed Can
12	120 Watt Recessed Can (On Dimmer)
23	Recessed Can With 150 Watt High Pressure Sodium Lamp (Structural Ceiling)
264	Recess Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling)
87	Recess Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling) (Over 30')
35	Recess Can W/ 2-18 Watt Compact Flourescent Lamps (Structural Ceiling)
14	Recess Can W/ 65 Watt (On Dimmer)
3	75 Watt Recess Can Fixture
5	Recess Can Fixture With 75 Watt Mercury Vapor Lamp
5	Recessed Square Fixture With 175 Watt Mercury Vapor Lamp (Structural Ceiling)
5	Recess Square Fixture With 250 Watt Mercury Vapor Lamp
23	Surface Can W/ 250 Watt Mercury Vapor Lamp (Structural Ceiling)
116	Surface Square Fixture With 400 Watt High Pressure Sodium Lamp
9	Track Head Fixture W/65 Watt ER Lamp
3	Vanity Fixture W/ 4-100 Watt Incan. Lamps

Qty.	Terminal E - Fixture Description
36	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
3	Exit Sign W/ 2-F6t5 Lamps (Edge Lit)
35	Exit Sign W/ Led Lamps
4,750	Terminal E Total

Qty.	Terminal F - Fixture Description
10	4'-2 Lamp Industrial Shade (Suspended)
29	4'-2 Lamp Industrial Shade W/Tube Guards
4	4'- 2 Lamp Strip Fixture
2	4'- 2 Lamp Strip Fixture (With T8's Existing)
5	4'- 2 Lamp Strip Fixture With Existing T8 Lamps & Magnetic Ballast
27	4'- 2 Lamp Vapor Tight Fixture
1	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
4	4'- 2 Lamp Wrap Fixture (With T8's Existing)
2	4'- 4 Lamp Recessed Troffer (2x4)
4	8'- 4 Lamp (4' Lamp) Strip Fixture (With T8's Existing)
2	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
2	8'- 2 Lamp (8' Lamps) Vapor Proof Fixture
2	8'- 2 Lamp (8' Lamps) Wrap Fixture
82	Canopy Type Fixture With 150 Watt High Pressure Sodium Lamp
4	Fixture With 400 Watt High Pressure Sodium Lamp
79	Canopy Fixture With 400 Watt High Pressure Sodium Lamp
1	High Intensity Discharge Fixture With 400 Watt Mercury Vapor Lamp
1	High Intensity Discharge Fixture With 400 Watt Mercury Vapor Lamp Canopy Fixture
1	160 Watt Porcelain Based Fixture (Mercury Vapor)
7	Pendant Shade With 100 Watt Incan. Lamp
37	Recessed Can With 100 Watt High Pressure Sodium Lamp (Structural Ceiling)
4	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
2	Led Exit Sign With Emergency Lighting
312	Terminal F Total

53

Qty.	Terminal G - Fixture Description
10	4'-2 Lamp Industrial Shade W/Tube Guards
5	4'- 2 Lamp Recessed Troffer (2x4)
2	4'- 2 Lamp Strip Fixture With Existing T8 Lamps & Magnetic Ballast
10	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
6	4' 3 Lamp Recessed Troffer
18	8'- 4 Lamp (4' Lamps) Industrial Shade
2	8'- 4 Lamp (4' Lamps) Industrial Shade (With T8's Existing)
35	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
1	8'- 2 Lamp (8' Lamps) Strip Fixture (Suspended)
152	Canopy Type Fixture With 150 Watt High Pressure Sodium Lamp
94	Canopy Fixture With 400 Watt High Pressure Sodium Lamp
7	100 Watt Porcelain Based Fixture
7	160 Watt Porcelain Based Fixture (Mercury Vapor)
6	Recess Can W/ 13 Watt Compact Flourescent Lamp
355	Terminal G Total

Qty.	Terminal H - Fixture Description
3	4'-2 Lamp Industrial Shade (Suspended)
3	4'-2 Lamp Industrial Shade W/Tube Guards
1	4'- 2 Lamp Vapor Tight Fixture
93	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
6	8'- 4 Lamp (4' Lamps) Industrial Shade
3	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
2	100 Watt Porcelain Based Fixture
4	160 Watt Porcelain Based Fixture (Mercury Vapor)
115	Terminal H Total

Qty.	Concourse E - Fixture Description
5	2'- 1 Lamp U6 Recessed Troffer (2x2)
4	2'- 2 Lamp Strip Fixture
507	2'- 2 Lamp U6 Recess Troffer (2x2)
1	2'- 3 Lamp U3 Fixture With T8 Lamps Existing (Magnetic Ballast)
3	3'-1 Lamp Strip Fixture
5	4'-1 Lamp Recessed Troffer (1x4)
3	4'-1 Lamp Recessed Troffer (1x4) (With T8's Existing)
10	4'- 1 Lamp Strip Fixture
2	4'-1 Lamp Strip Fixture (With T8's Existing)
1	4'-1 Lamp Vanity Fixture (With T8's Existing)
1	4'- 2 Lamp Cross Louver With Up Lighting
74	4'- 2 Lamp Industrial Shade With Existing T8 Lamps & Magnetic Ballast
4	4'-2 Lamp Industrial Shade W/Tube Guards
8	4'- 2 Lamp Recessed Troffer (1x4)
11	4'- 2 Lamp Recessed Troffer (1x4) (With T8's Existing)
30	4'- 2 Lamp Narrow Troffer Fixture (Existing T8 Lamps & Magnetic Ballast)
55	4'- 2 Lamp Recessed Troffer (2x4)
2	4'- 2 Lamp Recessed Troffer (2x4) (Missimg Lens)
10	4'- 2 Lamp Recessed Troffer (2x4) (With T8 Lamps & Magnetic Ballast)
23	4'- 2 Lamp Surface Box
57	4'- 2 Lamp Strip Fixture
10	4'- 2 Lamp Strip Fixture With Existing T8 Lamps & Magnetic Ballast
4	4'- 2 Lamp Strip Fixture (Tube Guards Needed)
13	4'- 2 Lamp Strip Fixture W/ Wire Guard
24	4'- 2 Lamp Vanity Fixture
4	4'- 2 Lamp Vanity Fixture (With T8's Existing)
19	4'- 2 Lamp Vapor Tight Fixture
58	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
3	4'- 2 Lamp Wrap Fixture
15	4' 3 Lamp Recessed Troffer
30	4'- 3 Lamp Recessed Troffer (T8 Lamps & Magnetic Ballast)
16	4'- 4 Lamp Recessed Troffer (2x4)
3	4'- 4 Lamp Recessed Troffer (2x4) (With T8's Existing)
15	4'- 4 Lamp Recessed Troffer (2x4) (With T8's Existing On Magnetic Ballast)
10	4'- 4 Lamp Recessed Troffer (2x4) (Tamperproof Fixture)
6	Two (2) - 3'-1 Lamp (T8 Lamps) Narrow Troffered Fixtures Butted End To End
11	8'-2 Lamp (4' Lamps) Narrow Troffer
59	8'- 2 Lamp (4' Lamps) Narrow Troffered Fixture (Existing T8 Lamps &

Qty.	Concourse E - Fixture Description
	Magnetic Ballast)
1	8'- 4 Lamp (4' Lamps) Industrial Shade
6	8'- 4 Lamp (4' Lamp) Recess Narrow Troffer Fixture (With T8's Existing)
3	8'- 4 Lamp (4' Lamp) Narrow Troffered Fixture (With T8's Existing & Magnetic Ballast)
146	8'- 4 Lamp (4' Lamp) Surface Box Fixture
8	8'- 4 Lamp (4' Lamp) Strip Fixture
12	8'- 4 Lamp (4' Lamp) Strip Fixture (With T8's Existing & Magnetic Ballast)
6	8'- 4 Lamp (4' Lamps) Vanity Fixture
4	8'- 4 Lamp (4' Lamp) Vapor Tight Fixture (Missing Lens)
19	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
12	8'- 2 Lamp (8' Lamps) Vapor Proof Fixture
36	Fixture With 150 Watt High Pressure Sodium Lamp
92	Canopy Type Fixture With 150 Watt High Pressure Sodium Lamp
47	175 Watt Mercury Vapor Canopy Fixture
2	Surface Box Type Fixture With 1-175 Watt Mercury Vapor Lamp (Wall Pack)
44	Fixture With 400 Watt High Pressure Sodium Lamp
9	Recessed Can With 100 Watt High Pressure Sodium Lamp (Structural Ceiling)
72	Recess Can Fixture With 100 Watt Mercury Vapor Lamp
527	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
6	Recess Can W/ 13 Watt Compact Flourescent Lamp
11	Recess Can W/ 175 Watt Mercury Vapor Lamp
120	Recess Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling)
25	Recess Can W/ 2-18 Watt Compact Flourescent Lamps
87	Recess Can W/ 2-18 Watt Compact Flourescent Lamps (Structural Ceiling)
13	Surface Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
2	Surface Can W/ 175 Watt Mercury Vapor Lamp
1	Surface Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling)
12	Surface Can W/ 250 Watt Mercury Vapor Lamp (Structural Ceiling) (Over 30')
7	Surface Drum W/ 1-32 & 1-22 Watt Circuline Lamp
5	Surface Drum W/ 2-52 Watt Incan. Lamps
4	Surface Drum W/ 1-32 Watt Circuline Lamp
12	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
10	Exit Sign W/ 7 Watt Compact Flourescent
32	Exit Sign W/ Led Lamps
2,509	**Concourse E Total**

56

Qty.	Satellite E - Fixture Description
16	2'- 1 Lamp Strip Fixture
1	2'- 2 Narrow Troffer
12	2'- 2 Lamp Strip Fixture
59	2'- 2 Lamp U6 Recess Troffer (2x2)
2	3'-2 Lamp Strip Fixture
39	4'- 1 Lamp Strip Fixture
5	4'- 1 Lamp Strip Fixture (Needs Tube Guards)
2	4'-1 Lamp Vanity Fixture (Fixture To Be Replaced)
2	4'-2 Lamp Industrial Shade (Suspended)
29	4'-2 Lamp Industrial Shade W/Tube Guards
7	4'- 2 Lamp Recessed Troffer (1x4)
2	4'- 2 Lamp Recessed Troffer (1x4) (With T8's Existing)
32	4'- 2 Lamp Narrow Troffer Fixture (Existing T8 Lamps & Magnetic Ballast)
1	4'- 2 Lamp Recessed Troffer (2x4)
44	4'- 2 Lamp Recessed Troffer (2x4) (With T8's Existing)
11	4'- 2 Lamp Recessed Troffer (2x4) (With T8 Lamps & Magnetic Ballast)
10	4'- 2 Lamp Surface Box
217	4'- 2 Lamp Strip Fixture
7	4'- 2 Lamp Strip Fixture With Existing T8 Lamps & Magnetic Ballast
1	4'- 2 Lamp Strip Fixture W/ Wire Guard
1	4'- 2 Lamp Vanity Fixture
129	4'- 2 Lamp Vapor Tight Fixture
8	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
1	4'- 2 Lamp Vapor Tight Fixture (With T8's Existing)
1	4'- 2 Lamp Wrap Fixture
106	4' 3 Lamp Recessed Troffer
185	4'- 3 Lamp Recessed Troffer (T8 Lamps & Magnetic Ballast)
2	4' 3 Lamp Wrap Fixture
34	4' 3 Lamp Wrap Fixture (With T8's Existing)
31	4'- 4 Lamp Recessed Troffer (2x4)
1	4'- 4 Lamp Recessed Troffer (2x4) (With T8's Existing)
5	4'- 4 Lamp Recessed Troffer (2x4) (With T8's Existing On Magnetic Ballast)
2	4'- 4 Lamp Surface Box Fixture
8	4'- 4 Lamp Strip Fixture (Suspended)
48	4'- 4 Lamp Wrap Fixture
1	8'- 2 Lamp (4' Lamps) Narrow Troffered Fixture (Existing T8 Lamps & Magnetic Ballast)

Qty.	Satellite E - Fixture Description
2	8'-2 Lamp (4' Lamps) Strip Fixture
1	8'- 4 Lamp (4' Lamps) Industrial Shade
5	8'- 4 Lamp (4' Lamp) Recess Narrow Troffer Fixture
3	8'- 4 Lamp (4' Lamp) Narrow Troffered Fixture (With T8's Existing & Magnetic Ballast)
5	8'- 4 Lamp (4' Lamp) Strip Fixture
1	8'- 4 Lamp (4' Lamp) Strip Fixture (With T8's Existing & Magnetic Ballast)
5	8'- 4 Lamp (4' Lamps) Vanity Fixture
20	8'- 4 Lamp (4' Lamp) Vapor Tight Fixture
3	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
66	8' 2 Lamp (8' Lamps) Industrial Shade Fixture (Wire Guard)
1	8'- 2 Lamp (8' Lamps) Narrow Troffer Fixture
20	8'- 2 Lamp (8' Lamps) Strip Fixture
1	8'- 2 Lamp (8' Lamps) Strip Fixture (Suspended)
32	8'- 2 Lamp (8' Lamps) Strip Fixture (Very High Output Lamps)
10	8'- 2 Lamp (8' Lamps) Vapor Proof Fixture
30	8'- 2 Lamp (8' Lamps) Vapor Proof Fixture (Missing Lens)
20	8'- 2 Lamp (8' Lamps) Wrap Fixture
7	8' 3 Lamp (8' Lamps) Industrial Shade Fixture
2	8' 3 Lamp (8' Lamps) Industrial Shade Fixture With Wire Guard
34	Hid Fixture With 175 Watt Mercury Vapor Lamp
2	400 Watt Metal Halide Hi- Bay Fixture (Flood Fixture)
1	400 Watt Metal Halide Hi- Bay Fixture (Wall Pack)
7	High Intensity Discharge Fixture With 400 Watt Mercury Vapor Lamp
11	100 Watt Porcelain Based Fixture
1	Porcelain Based Fixture With 1-200 Watt Lamp
1	52 Watt Porcelain Based Fixture
2	100 Watt Recessed Can
4	100 Watt Recessed Can (On Dimmer)
246	Recess Can Fixture With 100 Watt Mercury Vapor Lamp
413	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
56	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling) (Over 30')
8	Recess Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling)
105	Recess Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling) (Over 30')
39	Recess Can W/ 2-18 Watt Compact Fluorescent Lamps (Structural Ceiling)
12	Surface Box Fixture With 100 Watt Mercury Vapor Lamp
11	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
38	Exit Sign W/ Led Lamps

58

Qty.	Satellite E - Fixture Description
2,287	Satellite E Total

Qty.	Concourse F - Fixture Description
3	2'- 2 Lamp Strip Fixture
1	2'- 2 Lamp U6 Recess Troffer (2x2)
72	2'- 3 Lamp U3 Fixture With T8 Lamps Existing (Magnetic Ballast)
4	3'-2 Lamp Strip Fixture
6	4'- 1 Lamp Strip Fixture
13	4'- 2 Lamp Industrial Shade With Existing T8 Lamps & Magnetic Ballast
6	4'-2 Lamp Industrial Shade W/Tube Guards
4	4'- 2 Lamp Recessed Troffer (1x4)
16	4'- 2 Lamp Narrow Troffer Fixture (Existing T8 Lamps & Magnetic Ballast)
163	4'- 2 Lamp Recessed Troffer (2x4)
17	4'- 2 Lamp Recessed Troffer (2x4) (With T8's Existing)
22	4'- 2 Lamp Recessed Troffer (2x4) (With T8 Lamps & Magnetic Ballast)
300	4'- 2 Lamp Strip Fixture
37	4'- 2 Lamp Strip Fixture With Existing T8 Lamps & Magnetic Ballast
10	4'- 2 Lamp Strip Fixture (With T8's Existing) (Wire Guard)
36	4'- 2 Lamp Strip Fixture (Tube Guards Needed)
28	4'- 2 Lamp Vanity Fixture
6	4'- 2 Lamp Vapor Tight Fixture
2	4'- 2 Lamp Vapor Tight Fixture (With T8's Existing)
43	4' 3 Lamp Recessed Troffer
89	4'- 3 Lamp Recessed Troffer (T8)
12	4'- 4 Lamp Recessed Troffer (2x4)
231	Two (2) - 3'-1 Lamp Strip Fixtures Butted End To End (Over 20')
2	8'- 4 Lamp (4' Lamps) Industrial Shade
1	8'- 4 Lamp (4' Lamp) Recess Narrow Troffer Fixture
2	8'- 4 Lamp (4' Lamp) Narrow Troffered Fixture (With T8's Existing & Magnetic Ballast)
5	8'- 4 Lamp (4' Lamp) Wrap Fixture W/ Missing Lens
37	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
2	8'- 2 Lamp (8' Lamps) Industrial Shade Fixture (High Output Lamps)
2	8'- 2 Lamp (8' Lamps) Strip Fixture
20	8'- 2 Lamp (8' Lamps) Vapor Proof Fixture
4	8'- 2 Lamp (8' Lamps) Wrap Fixture
2	Fixture With 100 Watt High Pressure Sodium Lamp
2	Fixture With 150 Watt High Pressure Sodium Lamp
1	Fixture With 150 Watt High Pressure Sodium Lamp (Wall Pack)

Qty.	Concourse F - Fixture Description
2	Fixture With 250 Watt High Pressure Sodium Lamp
1	Jelly Jar W/ 100w
1	100 Watt Porcelain Based Fixture
1	160 Watt Porcelain Based Fixture (Mercury Vapor)
7	Pendant Shade Fixture With 160 Watt Mercury Vapor Lamp
8	Recessed Can With 100 Watt High Pressure Sodium Lamp (Structural Ceiling)
12	Recess Can Fixture With 100 Watt Mercury Vapor Lamp
344	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
29	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling) (Over 30')
9	120 Watt Recessed Can
9	Recessed Can With 150 Watt High Pressure Sodium Lamp (Structural Ceiling)
15	Recessed Can With 150 Watt High Pressure Sodium Lamp (Structural Ceiling) (Over 30')
61	Recess Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling)
2	Recess Can W/ 2-13 Watt Compact Fluorescent Lamps
13	Recess Can W/ 2-18 Watt Compact Fluorescent Lamps
17	Recess Can W/ 2-18 Watt Compact Fluorescent Lamps (Structural Ceiling)
1	Surface Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
19	Surface Can With 150 Watt High Pressure Sodium Lamp (Structural Ceiling)
93	Surface Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling)
5	Surface Can With 250 Watt High Pressure Sodium Lamp (Structural Ceiling)
17	Surface Can W/ 250 Watt Mercury Vapor Lamp (Structural Ceiling)
49	Surface Can W/ 250 Watt Mercury Vapor Lamp (Structural Ceiling) (Over 30')
44	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
23	Exit Sign W/ Led Lamps
1,983	Concourse F Total

Qty.	Concourse G - Fixture Description
2	2'- 2 Lamp U6 Recess Troffer (2x2)
2	2'- 2 Lamp Vanity Fixture
1	3'-2 Lamp Strip Fixture
1	4'- 1 Lamp Strip Fixture
6	4'- 2 Lamp Cross Louver With Up Lighting
11	4'- 2 Lamp Cross Louver (Suspended)
29	4'-2 Lamp Industrial Shade (Suspended)
4	4'- 2 Lamp Industrial Shade With Existing T8 Lamps & Magnetic Ballast

Qty.	Concourse G - Fixture Description
9	4'-2 Lamp Industrial Shade W/Tube Guards
8	4'-2 Lamp Industrial Shade W/Wire Guard
14	4'- 2 Lamp Recessed Troffer (1x4)
1	4'- 2 Lamp Recessed Troffer (1x4) (Missing Lens)
53	4'- 2 Lamp Narrow Troffer Fixture (Existing T8 Lamps & Magnetic Ballast)
25	4'- 2 Lamp Recessed Troffer (2x4)
1	4'- 2 Lamp Recessed Troffer (2x4) (Missing Lens)
11	4'- 2 Lamp Recessed Troffer (2x4) (With T8 Lamps & Magnetic Ballast)
2	4'- 2 Lamp Strip Fixture
63	4'- 2 Lamp Vanity Fixture
5	4'- 2 Lamp Vapor Tight Fixture
26	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
15	4'- 2 Lamp Wrap Fixture
18	4'- 2 Lamp Wrap Fixture W/ Missing Lens
1	4'- 2 Lamp Wrap Fixture (Tamper Proof)
31	4' 3 Lamp Recessed Troffer
4	4' 3 Lamp Recessed Troffer (Double Switched)
11	4' 3 Lamp Recessed Troffer (Missing Lens)
31	4'- 3 Lamp Recessed Troffer (T8 Lamps & Magnetic Ballast)
201	4'- 4 Lamp Recessed Troffer (2x4)
16	4'- 4 Lamp Recessed Troffer (2x4) (Over 30')
9	4'- 4 Lamp Recessed Troffer (2x4) (Missing Lens)
1	4'- 4 Lamp Wrap Fixture
50	8'- 4 Lamp (4' Lamp) Cross Louver Fixture (Suspended)
2	8'- 4 Lamp (4' Lamps) Vanity Fixture
3	8'- 4 Lamp (4' Lamp) Vapor Tight Fixture (Missing Lens)
16	8' 2 Lamp (8' Lamps) Cross Louver Fixture
6	8' 2 Lamp (8' Lamps) Cross Louver Fixture (Suspended)
12	8' 2 Lamp (8' Lamps) Industrial Shade Fixture (Suspended)
18	8'- 2 Lamp (8' Lamps) Vanity Fixture
2	8' 4 Lamp (8' Lamps) Industrial Shade
1	Brick Fixture W/ 2-52 Watt Incan. Lamp
18	Canopy Type Fixture With 150 Watt High Pressure Sodium Lamp
2	Hid Fixture With 175 Watt Mercury Vapor Lamp (Flood Fixture)
2	Fixture With 70 Watt High Pressure Sodium Lamp (Flood Fixture)
1	Explosion Proof Jelly Jar Fixture W/ 150 Watt Incandescent
4	100 Watt Porcelain Based Fixture
1	Pendant Shade With 100 Watt Incan. Lamp
22	Pendant Shade Fixture With 160 Watt Mercury Vapor Lamp

Qty.	Concourse G - Fixture Description
3	100 Watt Recessed Can
12	Recess Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
31	Recess Can W/ 2-26 Watt Compact Fluorescent Lamp
8	Recess Can W/ 2-26 Watt Compact Fluorescent Lamp (Structural Ceiling)
1	Recess Square Fixture W/ 1-100 Watt Incan. Lamp
2	Surface Drum W/ 1-52 Watt Incan.
16	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
1	Exit Sign W/ Led Lamps
846	**Concourse G Total**

Qty.	Concourse H - Fixture Description
7	2'- 2 Lamp Strip Fixture
6	2'- 2 Lamp U6 Recess Troffer (2x2)
1	2'- 2 Lamp U6 Recessed Troffer Fixture With T8 Lamps Existing
6	4'-1 Lamp Recessed Troffer (1x4)
101	4'- 2 Lamp Industrial Shade With Existing T8 Lamps & Magnetic Ballast
4	4'-2 Lamp Industrial Shade W/Tube Guards
1	4'- 2 Lamp Recessed Troffer (1x4)
29	4'- 2 Lamp Narrow Troffer Fixture (Existing T8 Lamps & Magnetic Ballast)
57	4'- 2 Lamp Recessed Troffer (2x4)
50	4'- 2 Lamp Recessed Troffer (2x4) (With T8's Existing)
29	4'- 2 Lamp Strip Fixture
57	4'- 2 Lamp Strip Fixture (With T8's Existing)
9	4'- 2 Lamp Strip Fixture With Existing T8 Lamps & Magnetic Ballast
4	4'- 2 Lamp Strip Fixture (With T8's Existing) (Wire Guard)
20	4'- 2 Lamp Vanity Fixture
6	4'- 2 Lamp Vanity Fixture With Battery Back-Up
5	4'- 2 Lamp Vanity Fixture (With T8's Existing)
15	4'- 2 Lamp Vapor Tight Fixture
15	4'- 2 Lamp Vapor Tight Fixture W/ Missing Lens
117	4' 3 Lamp Recessed Troffer
29	4'- 3 Lamp Recessed Troffer (With T8's Existing)
38	4'- 3 Lamp Recessed Troffer (T8 Lamps & Magnetic Ballast)
85	4'- 4 Lamp Recessed Troffer (2x4)
1	8'- 4 Lamp (4' Lamp) Strip Fixture
2	8'- 4 Lamp (4' Lamps) Vanity Fixture
48	8'- 1 Lamp Strip Fixture (Very High Output) Pendant Mounted
1	8' 2 Lamp (8' Lamps) Industrial Shade Fixture
6	8'- 2 Lamp (8' Lamps) Strip Fixture
4	8'- 2 Lamp (8' Lamps) Strip Fixture (Suspended)
4	8'- 2 Lamp (8' Lamps) Strip Fixture (Very High Output Lamps)
4	Canopy Type Fixture With 150 Watt High Pressure Sodium Lamp
2	Flood Type Fixture With 150 Watt High Pressure Sodium Lamp
2	Hid Fixture With 175 Watt Mercury Vapor Lamp (Wall Mounted)
9	Fixture With 200 Watt High Pressure Sodium Lamp (Surface Box)
9	Fixture With 250 Watt High Pressure Sodium Lamp
36	Canopy Fixture With 400 Watt High Pressure Sodium Lamp
4	High Intensity Discharge Surface Box Fixture With 400 Watt Mercury Vapor Lamp

Qty.	Concourse H - Fixture Description
6	High Intensity Discharge Fixture With 400 Watt Mercury Vapor Lamp Canopy Fixture
7	100 Watt Porcelain Based Fixture
4	160 Watt Porcelain Based Fixture (Mercury Vapor)
3	Recess Can Fixture With 175 Watt Metal Halide Lamp
14	Recess Can Fixture With 175 Watt Metal Halide Lamp (Structural Ceiling)
1	Recess Can W/ 175 Watt Mercury Vapor Lamp
110	Recess Can W/ 175 Watt Mercury Vapor Lamp (Structural Ceiling)
6	Recess Can W/ 2-18 Watt Compact Fluorescent Lamps (Structural Ceiling)
11	Recess Can W/ 2-26 Watt Compact Fluorescent Lamp
11	Recess Can W/ 2-26 Watt Compact Fluorescent Lamp (Structural Ceiling)
1	Fixture With 400 Watt High Pressure Sodium Lamp (Structural Ceiling)
1	Surface Can Fixture With 100 Watt Mercury Vapor Lamp (Structural Ceiling)
1	Surface Drum W/ 2-52 Watt Incan. Lamps
10	Exit Sign W/ 2-15 Watt Lamps & Red Lens (One Sided)
8	Exit Sign W/ 7 Watt Compact Fluorescent
16	Exit Sign W/ Led Lamps
1,033	Concourse H Total

Schedule C
Savings Guarantee

ENERGY SAVINGS GUARANTEE

FPL SERVICES, LLC, herein after referred to as "The COMPANY", guarantees that, during each Guarantee Report period during the Savings Guarantee Term, the Equipment shall be capable of producing Annual Energy Cost Savings (defined below) in an amount equal to or greater than Annual Guaranteed Savings (defined below) for such annual period, subject to the OWNER's, herein after referred to as "OWNER", operation of the Equipment per the Operating Plan, adjustments which the COMPANY is entitled to make per the terms of this Savings Guarantee, and all other terms of this Savings Guarantee.

This Savings Guarantee only applies to the designated Equipment specified in this Savings Guarantee. Attachments and Exhibits to this Savings Guarantee are incorporated by reference.

SECTION 1. BASIC REQUIREMENTS OF THIS SAVINGS GUARANTEE

(A) DEFINITIONS.

Initially capitalized terms in this Savings Guarantee have the meaning described in Section 2, and in the absence of such definition, as the context reasonably requires.

(B) OWNER CONTROLLED VARIABLES AND OPERATING PLAN

(1) For purposes of this Savings Guarantee, the OWNER represents, warrants, and agrees to operate the Equipment as required in the Operating Plan, to properly maintain (and replace, when necessary) the Equipment, to protect against and replace in the event of any casualty, and not to undertake any Changes which would adversely affect or reduce the Annual Energy Cost Savings.

(2) In the event of any failure of the OWNER to operate per the Operating Plan or in the event of any Changes, the OWNER agrees to notify the COMPANY in writing within five (5) business days of any actual, anticipated, or intended variation from the Operating Plan or other Changes, whether before Substantial Completion or during the Savings Guarantee Term, which could impact any facility or Equipment to which this Savings Guarantee applies. Upon receipt of such a notice, or in any event if the COMPANY independently learns of any such Changes, COMPANY shall be entitled to adjust the Annual Energy Cost Savings to reflect Annual Energy Cost Savings to exclude any adverse impact of any such Changes.

(3) Subject to the COMPANY preparing and submitting the annual Guarantee Report to the OWNER (with adjustments as described in this Savings Guarantee), this Savings Guarantee is based upon M&V Option A as detailed in this Guarantee.

(C) UNDERSTANDING UTILITY BILLS

(1) This Savings Guarantee and the Annual Energy Cost Savings in any Guarantee Report is not a representation, guarantee, or warranty that the actual dollar amount of utility bills of the OWNER will be reduced or lower than before, as so many other factors affect utility bills. This is only a guarantee that the Annual Energy Cost Savings will meet or exceed the Annual Guaranteed Savings during each respective annual measurement period during the Savings Guarantee Term if the Equipment is operated as required by the Operating Plan. As the OWNER has sole custody and control over the Equipment and any Changes, the COMPANY is permitted to adjust the Annual Energy Cost Savings so that the impact of any Changes are not attributed against COMPANY and so that the Annual Energy Cost Savings calculation is not adversely affected by Changes.

(2) Cost savings, and actual utility bills, are two completely different concepts. Actual utility bills can be affected by many different reasons in the sole control of the OWNER, such as the OWNER changes in building occupancy, hours or times of day of use, the way that Equipment (or equipment not installed by the COMPANY) is operated (hours, load level, environmental conditions, etc.), and maintenance. Actual utility bills can also be affected by increases in utility rates and government imposed taxes.

(3) This Savings Guarantee and any achievement of the Annual Guaranteed Savings does not directly represent nor depend upon the OWNER actual utility bills, and is not a guarantee of a lower utility bill in terms of absolute dollars.

(D) SAVINGS DETERMINATION METHODOLOGY

(1) The 2008 Federal Energy Management Program (FEMP) M&V Guidelines Version 3.2 and 2007 International Performance Measurement and Verification Protocol ("IPMVP") are voluntary consensus documents written by and for technical, procurement and financial personnel in government, commerce, and industry. The FEMP M&V Guideline and IPMVP provide an overview of current measurement & verification (M&V) techniques and set the framework for verifying third-party-financed energy projects for public (including Federal) and private-sector projects. They dictate that energy (or water) savings are determined by comparing the energy (or water) use associated with a facility or certain systems within a facility before and after the installation of an energy conservation measure (ECM) or other measure. The "before" case is called the baseline. The "after" case is called the post-installation, or performance, period. Baseline and post-installation energy use measurements or estimates can be constructed using the methods associated with M&V Options as described in these guidelines. The challenge of M&V is to balance M&V costs, accuracy, and repeatability with the value of the ECM(s) or systems being evaluated, and to increase the potential for greater savings by careful monitoring and reporting. Therefore, the Protocol recommends Option A (Partially Measured Retrofit Isolation) and Option B (Retrofit Isolation) for the measured savings portion or non-stipulated/non-calculated portion. Attachment 7 contains a detailed summary of the verification methods.

(2) THE ANNUAL GUARANTEE REPORT. Commencing upon the anniversary of the Final Acceptance Date, and upon each anniversary thereafter occurring during the Savings Guarantee Term (subject to a reasonable amount of preparation time for the COMPANY), the COMPANY shall deliver an annual Guarantee Report to the OWNER. Such annual Guarantee Report shall provide the results and supporting information of the COMPANY'S calculation of the Annual Energy Cost Savings and compare the Annual Energy Costs Savings to the Annual Guaranteed Savings.

(3) This savings guarantee has been structured to comply with provisions of F.S 489.145 (4)c which provides that the amount of annually guaranteed savings must "... meet or exceed total annual contract payments made by the agency...." Total annual contract payments, as determined by a separate third party finance agreement, are inclusive of all costs associated with this program to include all development and implementation, financing and interest, bonding, and feasibility study costs.

SECTION 2. DEFINITIONS: References in this Savings Guarantee to exhibits or other attachments serves to incorporate by reference such exhibits and other attachments into this Savings Guarantee. The following initial capitalized terms in this Savings Guarantee have the meaning set forth below.

"Agreement" means the Energy Services Agreement entered into between Miami Dade County and FPL SERVICES, LLC.

"Annual Energy Cost Savings" means, for each respective annual Guarantee Report period, the total of (1) the Measured Load Reduction times the Contract Utility Rates calculated for such period, plus (2) the Measured Load Shift times the difference between the applicable On Peak Rate Categories and Off Peak Rate Categories, calculated for such period, plus (3) any Stipulated Savings for such period.

"Annual Guaranteed Savings" means such level of Annual Energy Cost Savings to be exactly equal to the amount of the regularly scheduled payments to be made by the OWNER for the Equipment under the Agreement for the respective annual Guarantee Report time period, as calculated by the COMPANY.

"Changes" means any deviation, modification, alteration, or change from (1) OWNER operation of the Equipment as required in accordance with the Operating Plan and/or (2) OWNER use or operation of its facilities as observed by the COMPANY at the time of its inspections. Without limitation, changes include any conditions which may, do, or are reasonably expected to alter the use of any Equipment or to impact the Annual Energy Cost Savings, and include (without limitation) changes in the primary use of any facility covered by this Savings Guarantee, changes to operating hours, levels of use, occupancy, changes to utility suppliers, method of utility billing or utility purchasing, any casualty, loss, destruction of Equipment, any changes to the Equipment or any facility, any failure to adequately or properly maintain Equipment. For purposes of clarity, conditions that are deemed to be Changes need not be specifically identified as an underlying assumption or baseline by COMPANY.

"Contract Utility Rates" means the rates set forth in Attachment 2 (applicable for the entire Savings Guarantee Term). The rates shall be the prevailing utility rates plus all surcharges and taxes in effect and applicable to the OWNER as in effect on the date of this Guarantee.

"COMPANY" has the meaning in the Agreement, FPL SERVICES, LLC.

"Equipment" means the Load Reduction Equipment and the Load Shift Equipment.

"Final Acceptance Date" means the date that the COMPANY and the OWNER designate all work associated with the Equipment/Project is complete.

"Guarantee Report" means the respective annual report issued by the COMPANY to the OWNER, during each calendar year anniversary occurring during the Savings Guarantee Term which provides the results and supporting information of the COMPANY'S calculation of the Annual Guaranteed Savings, conducted per the Post Installation Measurement(s), and as adjusted by the COMPANY in accordance with this Savings Guarantee.

"Load Reduction Equipment" means those items of Equipment, which are to achieve load reduction as designated by the COMPANY in the Guarantee Report.

"Load Shift Equipment" means those items of Equipment, which are to achieve load shift as designated by the COMPANY in the Guarantee Report.

"Measured Load Reduction" means the difference between the OWNER electric energy load from (A) the pre-existing equipment which was retrofitted and/or replaced by the COMPANY with the Load Reduction Equipment, and (B) the greater of (1) OWNER actual use of the Load Reduction Equipment or (2) the agreed upon level of use of the Load Reduction Equipment in accordance with the Operating Plan.

"Measured Load Shift" means the amount of the OWNER electric energy load shifted from (A) the use of non-Load Shift Equipment (identified at the time of the Pre-Installation Measurement) during the On Peak Rate Categories to (B) the greater of (1) OWNER actual use of the Load Shift Equipment or (2) the agreed upon level of use of the Load Shift Equipment in accordance with the Operating Plan.

"Measured Savings" means (1) the Measured Load Reduction times the Contract Utility Rates calculated for such period, plus (2) the Measured Load Shift times the difference between the applicable On Peak Rate Categories and Off Peak Rate Categories, calculated for such period.

"Off Peak Rate Categories" means the lower of (1) any applicable off peak rate categories or non-prime rate categories of the utility providing service to the OWNER as in effect on the date of the Agreement, or (2) any applicable off peak rate categories or non-prime rate categories of the utility providing service to the OWNER as in effect on the date of the COMPANY'S delivery of the respective annual Guarantee Report to the OWNER. The COMPANY'S calculation of the Off Peak Rate Categories shall include and be based upon a stipulated and imputed escalation rate set forth in the Exhibits to this Savings Guarantee, which the COMPANY and the OWNER agree to be a reasonable rate of historic increase for purposes of calculating this Savings Guarantee (and for no other purpose).

"On Peak Rate Categories" means the greater of (1) any applicable on peak rate categories or prime rate categories of the utility providing service to the OWNER as in effect on the date of the Agreement, plus all surcharges and taxes applicable thereto, or (2) any applicable peak rate categories or prime rate categories of the utility providing service to the OWNER as in effect on the date of the COMPANY'S delivery of the respective annual Guarantee Report to the OWNER, plus all surcharges and taxes applicable thereto. The COMPANY'S calculation of the On Peak Rate Categories shall include and be based

upon a stipulated and imputed escalation rate set forth in the Exhibits to this Savings Guarantee, which the COMPANY and the OWNER agree to be a reasonable rate of historic increase for purposes of calculating this Savings Guarantee (and for no other purpose).

"Operating Plan" shall mean the OWNER operation of the Equipment in accordance with the operating plan in Attachment 1 which is incorporated by reference, including but not limited to the committed level and hours of use by the OWNER of the Load Reduction Equipment and the Load Shift Equipment as listed in the Operating Plan.

"Owner" has the meaning in the agreement, Miami-Dade County, Florida.

"Savings Guarantee" means this Savings Guarantee and all of its terms and conditions.

"Savings Guarantee Term" means the time period during which the OWNER is making regularly scheduled payments under the Agreement for the Equipment specified in this Savings Guarantee (and not any other equipment which may be covered by the Agreement), provided however, that notwithstanding such longer payment period under the terms of the Agreement, the Savings Guarantee Term shall not exceed ten (10) years from the date of final acceptance by the County.

"Stipulated or Calculated Savings" means those additional savings associated with the Equipment which the OWNER and COMPANY have mutually agreed upon as being realized by the OWNER as set forth in the Operating Plan or other exhibits/attachments to this Savings Guarantee, including but not limited to Attachment 3. Stipulated (or calculated) Savings do not need to be measured or monitored, and are not subject to verification in the Post Installation Measurement. By example, Stipulated Savings may consist of maintenance cost savings or other savings, which are difficult to measure or monitor on an ongoing basis.

"Substantial Completion" means the date that the COMPANY designates the Equipment as substantially installed and available for operation and use by the OWNER, excluding minor punch list items which do not affect the use or operation of the Equipment as a whole.

SECTION 3. SAVINGS GUARANTEE

Subject to all terms of this Savings Guarantee, during the Savings Guarantee Term the COMPANY guarantees that, for each annual Guarantee Report period, the Equipment shall, if operated in accordance with the Operating Plan, produce Annual Energy Cost Savings in an amount equal to or greater than Annual Guaranteed Savings for such annual period.

All of the COMPANY'S obligations under this Savings Guarantee, as to each time period covered by each annual Guarantee Report, shall be deemed fully satisfied and performed (A) upon presentation to the OWNER of the annual Guarantee Report which indicates that the Annual Energy Cost Savings meets or exceeds the Annual Guaranteed Savings for such respective annual period, or (B) when payment is made, if required, pursuant to the sole and exclusive remedy described in Section 5(B) of this Savings

Guarantee. Thereafter, during any annual measurement period, the COMPANY shall not be further obligated to monitor, measure, extrapolate, or prove any Annual Energy Cost Savings for that or any prior time period.

SECTION 4. THE ANNUAL GUARANTEE REPORT PROCEDURE

(A) The Annual Energy Cost Savings shall be determined by the COMPANY in an annual Guarantee Report and based upon the COMPANY'S baseline calculations as described in Attachment 6 and subject to adjustments by the COMPANY for any Changes. Within ninety (60) days following the first anniversary of the final acceptance and each anniversary thereafter during the Savings Guarantee Term, the COMPANY shall apply current data to update any necessary baseline calculations for the Changes and provide the OWNER with a copy of the respective annual Guarantee Report for that annual time period. The COMPANY'S updated calculations shall be in accordance with this Savings Guarantee, and to the extent of calculating and adjusting for any Changes, shall be in accordance with trade industry standards and practices, and the COMPANY'S updated calculations (including but not limited to adjustments for Changes) shall be final and conclusive. The OWNER shall retain the right to review and approve, which approval shall not be unreasonably withheld, the data collection process, and the data to be used in updating the baseline calculations. Such review may be conducted by a qualified, independent contractor selected by the OWNER, and approved by the COMPANY.

(B) In connection with each annual Guarantee Report, the COMPANY may also conduct a brief energy audit inspection of the OWNER facilities. This shall enable the COMPANY to determine what types of Changes the OWNER has made to its facility, business, or operations (including, but not limited to, Changes).

(C) If a Guarantee Report indicates that the respective Annual Energy Cost Savings for the then current annual Guarantee Report period is at least equal to the Annual Guaranteed Savings amount for such annual period, then the COMPANY shall be deemed to have achieved and performed the Savings Guarantee for such annual period and shall not have any further obligation under this Savings Guarantee for such annual period or any prior annual period, and shall not be obligated to take any further action until the next scheduled annual Guarantee Report period.

(D) In the event of the OWNER removal, destruction, substitution, modification, or other alteration of the Equipment, any Changes, or the OWNER failure to operate the Equipment for the hours or at the levels set forth in the Agreement or this Savings Guarantee (including, but not limited to, Changes), the COMPANY may adjust the Annual Energy Cost Savings to reflect savings as if the OWNER had not made any such Changes and as if the OWNER had continued to operate the Equipment in accordance with the Operating Plan, and this adjustment shall apply for all purposes of the Guarantee Report and calculation of the Annual Energy Cost Savings and satisfaction of this Savings Guarantee.

SECTION 5. EXCLUSIVE REMEDIES OF OWNER

(A) Prior to delivery of any annual Guarantee Report, in the event that such Guarantee Report would indicate that the Equipment will otherwise fail to produce Annual Energy Cost Savings in an amount at least equal to the Annual Guaranteed Savings for such annual period (and such situation is not caused by the OWNER failure to operate the Equipment per this Savings Guarantee), the COMPANY may, on one or more occasions, take action to cause the Annual Energy Cost Savings to equal or exceed the Annual Guaranteed Savings, including but not limited to fine tuning of Equipment, the addition of implementation methods, operation methods, or energy conservation measures which increase the Annual Energy Cost Savings. In any such remedy case, the COMPANY shall provide the OWNER with notice of any such activity including an annual Guarantee Report, which will provide the appropriate details. Any such action shall not adversely impact facility operations nor impede on normal facility functionality.

(B) The COMPANY may take all other actions to help the Annual Energy Cost Savings equal or exceed the Annual Guaranteed Savings, including but not limited to the addition of implementation methods, operation methods, or energy conservation measures which increase the Annual Energy Cost Savings. The OWNER shall have the right to review and approve, which approval shall not be unreasonably withheld, any such action to ensure that they do not adversely impact facility operations nor impede on normal facility functionality.

(C) If, after taking the actions described above (which the COMPANY shall describe to the OWNER in the Guarantee Report) and performing any follow up which the COMPANY deems necessary, such Guarantee Report still indicates that the Annual Energy Cost Savings in such Guarantee Report is not at least equal to the Annual Guaranteed Savings amount for such annual period, then the COMPANY shall pay to the OWNER an amount equal to the difference for such respective annual period between the Annual Guaranteed Savings amount and the Annual Energy Cost Savings in such annual Guarantee Report. This shall only be for the then current annual Guarantee Report and shall not affect any prior or any future annual Guarantee Report. The OWNER agrees not to offset, deduct, set-off, withhold, or delay any payment due under the Agreement. This is the OWNER sole and exclusive remedy under this Savings Guarantee, and no other rights or remedies are granted.

SECTION 6. EXCLUSIONS AND LIMITATIONS

(A) THE SOLE AND EXCLUSIVE REMEDY OF MIAMI DADE COUNTY UNDER THIS SAVINGS GUARANTEE IS SPECIFICALLY STATED ABOVE. EXCEPT AS SET FORTH ABOVE IN THIS SAVINGS GUARANTEE, THE COMPANY HAS NOT MADE AND DOES NOT HEREBY MAKE ANY WARRANTY, EXPRESS OR IMPLIED, AS TO ANY MATTER WHATSOEVER, INCLUDING WITHOUT LIMITATION, THE CONDITION, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY EQUIPMENT OR THE REDUCTION IN THE OWNER ENERGY USAGE AS A RESULT OF THE INSTALLATION AND OPERATION OF ANY EQUIPMENT.

(B) THE COMPANY SHALL NOT BE RESPONSIBLE FOR INCIDENTAL, INDIRECT, PUNITIVE, OR CONSEQUENTIAL DAMAGES, INCLUDING BUT WITHOUT LIMITATION, PROPERTY DAMAGE RESULTING FROM, OR RELATED TO THE AGREEMENT OR THE EQUIPMENT (INCLUDING BUT NOT LIMITED TO THE

MALFUNCTION OR MISOPERATION THEREOF), BODILY INJURY, MENTAL ANGUISH, MENTAL INJURY OR DISEASE, LOSS OF PROFITS, AND GOODWILL, REGARDLESS OF THE CAUSE OR BASIS OF SUCH ACTION, WHETHER IN STRICT LIABILITY, CONTRACT, TORT, OR OTHERWISE.

IN WITNESS WHEREOF, and intending to be legally bound, the parties hereto subscribe their names to this Contract by their duly authorized officers on the date first above written.

ATTEST:

_____ By_____

_____ By_____

ATTACHMENT 1

Multiple copies of this document shall be provided for each facility/area for which different occupancy information applies.

ANNUAL LIGHTING HOURS

Facility/Area	Average Hours of Operation
Terminal A	5,889
Terminal B	6,086
Terminal C	5,310
Terminal E	6,048
Concourse E	6,049
Satellite E	5,167
Terminal F	6,113
Concourse F	5,831
Terminal G	4,479
Concourse G	5,710
Terminal H	5,427
Concourse H	5,014

ATTACHMENT 2

Contract Utility Rates

The Contract Utility Rates for first year during the Savings Guarantee Term are set forth below and shall be used for all calculations made under this Agreement.

Contract Utility Rates

The Contract Utility Rates for first year during the Savings Guarantee Term are set forth below and shall be used for all calculations made under this Agreement.

Facility	$/kWh (blended on-peak/off-peak)	$/kWh (blended overall)	$/kWd
Terminal A	$0.0701	$0.0861	$10.24
Terminal B	$0.0701	$0.0861	$10.24
Terminal C	$0.0697	$0.0846	$9.64
Terminal E	$0.0728	$0.0857	$8.34
Concourse E	$0.0729	$0.0888	$8.38
Satellite E	$0.0686	$0.0879	$10.23
Terminal F	$0.0728	$0.0857	$8.34
Concourse F	$0.0707	$0.0854	$9.93
Terminal G	$0.0728	$0.0857	$8.34
Concourse G	$0.0727	$0.0860	$8.35
Terminal H	$0.0728	$0.0857	$8.34
Concourse H	$0.0706	$0.0848	$8.94

ATTACHMENT 2-A

% Utility Rates Escalation Rates (these are historical averages used for developing savings estimates only and are not binding as it pertains to this Guarantee)

Year	Electricity/ Water	Maintenance/ Material
1	0%	0%
2	2%	3%
3	2%	3%
4	2%	3%
5	2%	3%
6	2%	3%
7	2%	3%
8	2%	3%
9	2%	3%
10	2%	3%
11	2%	3%
12	2%	3%

The rates set forth above shall be based upon a compounding of the immediately preceding year's escalated rate (i.e. compounded escalation annually).

ATTACHMENT 3

DESCRIPTION OF CALCULATED SAVINGS

Lighting Material Savings
Lighting material calculated savings and the associated assumptions are provided for each area in the report titled, "MD GSA MDAD Terminal Feasibility Study – Phase II." This report is incorporated into this Guarantee Document.

HVAC Savings due to Lighting Reduction
HVAC calculated savings due to lighting and the associated assumptions are provided for each area in the report titled, "MD GSA MDAD Terminal Feasibility Study – Phase II." This report is incorporated into this Guarantee Document.

Occupancy Sensors Calculated Savings
Occupancy calculated stipulated savings and the associated assumptions are provided for each area in the report titled, "MD GSA MDAD Terminal Feasibility Study – Phase II." This report is incorporated into this Guarantee Document.

SUMMARY OF STIPULATED/CALCULATED SAVINGS

The savings identified below shall be Stipulated/Calculated Savings which are mutually agreed by OWNER and the COMPANY, but will not be specifically measured. The Stipulated/Calculated Savings shall be deemed to increase during each year of the Savings Guarantee Term by the annual escalation percentages set forth below, with such escalation being annually compounded upon the immediately preceding year escalated rate.

Source of Savings	First Year Savings (non – escalated)	Annual Escalation
LIGHTING LAMP MATERIAL SAVINGS	$145,570	0% (1st yr) 0% (Yrs 2 & 3)
LIGHTING BALLAST MATERIAL SAVINGS	$49,038	0% (1st yr) 0% (Yrs 2 -10)
HVAC SAVINGS DUE TO LIGHTING REDUCTION	$62,718	0% (1st yr) 2% (Yrs 2 -12)
Total Calculated Savings	**$257,326**	**N/A**

ATTACHMENT 4

Measured Savings – Lighting

Per Option A, Lighting pre measurements with annual post spot measurements will be taken to establish energy consumption, for a representative sample of the lights. These measurements will be accomplished through the use of hand held meters and/or mounting of temporary meters (by FPL Services, LLC). The results will be used to prorate the calculated savings, thus determining the adjustment (+/-), to be used in the comparison with the Guaranteed Savings.

Equations for Calculating Lighting Energy and Demand Savings

To determine estimates of energy savings for lighting efficiency projects use the following equation:

$$\text{Total kWh Savings}_t = \sum_u [(\text{kW/Fixture}_{baseline} \times \text{Quantity}_{baseline} - \text{kW/Fixture}_{post} \times \text{Quantity}_{post}) \times \text{Hours of Operation}]_{t,u}$$

Note: *$\sum_u$ means that the same formula will be used for each fixture usage group, and then the results of the formula for each fixture group will be added to each other, to come up with the total kWh savings.*

where:

KWh Savings =	kilowatt-hour savings realized during the post-installation time period *t*
$KW/fixture_{baseline}$ =	lighting baseline demand per fixture for usage group *u*
$kW/fixture_{post}$ =	lighting demand per fixture during post-installation period for usage group *u*
$Quantity_{baseline}$ =	quantity of affected fixtures before the lighting retrofit for usage group *u*, adjusted for inoperative and nonoperative lighting fixtures
$Quantity_{post}$ =	quantity of affected fixtures after the lighting retrofit for usage group *u*
Hours of Operation =	number of operating hours during the time period *t* for the usage group *u*, assuming operating hours are the same before and after measure installation

Demand

Demand savings can be calculated as either an average reduction in demand or as a maximum reduction in demand.

Average reduction in demand is generally easier to calculate. It is defined as kWh savings during

the time period in question (e.g. utility summer peak period) divided by the hours in the time period.

Maximum demand reduction, with respect to cost savings, is typically the reduction in utility meter maximum demand under the terms and conditions specified by the servicing utility. For peak load reduction, for example, the maximum demand reduction may be defined as the maximum kW reduction averaged over 30-minute intervals during the utility's summer peak period. The maximum demand reduction is usually calculated to determine savings in utility peak demand charges.

Annual Reconciliation

The annual reconciliation is based on the difference between guaranteed savings and measured savings extrapolated from representative measured sampling. Excess savings will be left to OWNER. A shortfall in any given year would be funded by FPL Services, LLC to the OWNER. Option A will be used for Measurement and Verification.

Sample Lighting Savings Calculation (Terminal A):

153.99 kW x $10.24/kW x 12 months = $18,922.91

1,304,503.31 kWh x $0.0701/kWh = $91,445.68

Savings	$110,369	(Terminal A)
Savings	$27,323	(Terminal B)
Savings	$4,821	(Terminal C)
Savings	$105,414	(Terminal E)
Savings	$62,333	(Concourse E)
Savings	$77,738	(Satellite E)
Savings	$25,812	(Terminal F)
Savings	$51,465	(Concourse F)
Savings	$32,916	(Terminal G)
Savings	$20,224	(Concourse G)
Savings	$2,268	(Terminal H)
Savings	$31,344	(Concourse H)

Total Guaranteed Lighting Savings: $552,026 (sum of all facilities)

Measured Adjusted Savings Calculation:
Percentage of Measured Values vs. Calculated Values x Total guaranteed Savings = Excess Savings or Shortfall in Savings

ATTACHMENT 5

Annual Guaranteed Savings Allocation

Savings Guarantee Term Year	Measured Savings	Stipulated/ Calculated Savings	Annual Guaranteed Energy Cost Savings
1	$552,026	$257,326	$809,352
2	$567,272	$258,580	$825,852
3	$578,618	$259,860	$838,477
4	$590,190	$115,595	$705,785
5	$601,994	$116,926	$718,920
6	$614,034	$118,283	$732,317
7	$626,314	$119,668	$745,983
8	$638,841	$121,081	$759,922
9	$651,617	$122,522	$774,139
10	$664,650	$123,992	$788,641
11	$677,943	$76,452	$754,395
12	$691,502	$77,981	$769,483
Total	$7,459,123	$1,768,266	$9,227,389

ATTACHMENT 6

Guarantee Report

Within ninety (60) days following the final acceptance and each anniversary thereafter during the Savings Guarantee Term, the COMPANY shall provide the Guarantee Report to OWNER. In the Guarantee Report, the COMPANY shall calculate the Annual Energy Cost Savings and shall report to OWNER such amount (and shall detail any excess savings where the Annual Energy Cost Savings exceed the Annual Guaranteed Savings) during the preceding year.

Annual Guaranteed and Excess Savings Allocation

Savings Guarantee Term Year	Measured Savings	Stipulated/ Calculated Savings	Actual Savings	Annual Guaranteed Energy Cost Savings	Excess Savings
1		$257,326		$813,475	%
2		$258,580		$825,852	%
3		$259,860		$838,477	%
4		$115,595		$705,785	%
5		$116,926		$718,920	%
6		$118,283		$732,317	%
7		$119,668		$745,983	%
8		$121,081		$759,922	%
9		$122,522		$774,139	%
10		$123,992		$788,641	%
11		$76,452		$754,395	%
12		$77,981		$769,483	%
Totals		$1,768,266		$9,227,389	

ATTACHMENT 7

Summary of Measurement and Verification Options

All the methods in the FEMP/IPMVP Guideline for determining savings are based on the same concept; namely, those energy savings are derived by comparing energy usage after a retrofit to the baseline. It is relatively easy to measure post-retrofit consumption; however, it is impossible to "measure" what the energy usage would be without the retrofit. Therefore, it is impossible to "measure" energy savings.

Energy savings can only be determined based on assumptions about the baseline. Four options are provided to determine energy savings. A particular option is chosen based on the on project-specific features of each performance contract.

The options differ in their approach to the level and duration of the retrofit verification measurements. For instance, Options A and B both apply at the system or ECM level, while Option C uses measurements taken at the whole-building, or whole-facility, level. Option A involves short-term (if any) measurements, while Options B and C use short term and/or continuous or regular interval measurements during the term of the contract. Option D involves computer simulation techniques.

Each option has advantages and disadvantages based on site-specific factors.

The four options are described in the table below.

Overview of M&V Options (from the FEMP/IPMVP)

M&V option	How savings are calculated	Typical Applications
A. Partially Measured Retrofit Isolation Savings are determined by partial field measurement of the energy use of the system(s) to which an ECM was applied; separate from the energy use of the rest of the facility. Measurements may be either short-term or continuous. Partial measurement means that some but not all parameter(s) may be stipulated, if the total impact of possible stipulation error(s) is not significant to the resultant savings. Careful review of the ECM design and installation will ensure that stipulated values fairly represent the probable actual value.	Engineering calculations using short-term or continuous post-retrofit measurements and stipulations.	Lighting retrofit where power draw is measured periodically. Application of controls to vary the load on a constant speed pump using a variable speed drive. Power draw is measured on a spot basis, while varying load. Operating hours of are specified/ stipulated.

M&V option	How savings are calculated	Typical Applications
B. Retrofit Isolation Savings are determined by field measurement of the energy use of the systems to which the ECM was applied; separate from the energy use of the rest of the facility. Short-term or continuous measurements are taken throughout the post-retrofit period.	Engineering calculations using short term or continuous measurements.	Application of controls to vary the load on a constant speed pump using a variable speed drive. Electricity use is measured by a kWh meter installed on the electrical supply to the pump motor. In the base year this meter is in place for a usually week to verify constant loading. The meter is in place periodically throughout the post-retrofit period to track variations in energy use.
C. Whole Facility Savings are determined by measuring energy use at the whole facility level. Short-term or continuous measurements are taken throughout the post-retrofit period.	Analysis of whole facility utility meter or sub-meter data using techniques from simple billing comparison to regression analysis	Multifaceted energy management program affecting many systems in a building. Energy use is measured by the gas and electric utility meters for a twelve month base year period and throughout the post-retrofit period.
D. Calibrated Simulation Savings are determined through simulation of the energy use of components or the whole facility. Simulation routines must be demonstrated to adequately model actual energy performance measured in the whole facility. This option usually requires considerable skill in calibrated simulation.	Energy use simulation, calibrated with hourly utility billing data and/or end-use metering	Multifaceted energy management program affecting many systems in a building where no base year data are available. Post-retrofit period energy use is measured by the gas and electric utility meters or sub-metering. Base year energy use is determined by simulation using a model calibrated by use of sub-metering.

Option A – Spot Measured Savings

The verification techniques for Option A determine savings by measuring the capacity or efficiency of a system before and after a retrofit and by multiplying the difference by an agreed-upon or "stipulated" factor, such as hours of operation or load on the system. Option A is best applied to individual loads or systems within a building, such as a lighting system or chiller.

Option A is an approach designed for projects in which the potential to generate savings must be verified, but the actual savings can be stipulated based on the results of the "potential to generate savings" verification and engineering calculations (and perhaps on short-term data collection). Post-installation energy use is not measured throughout the term of the contract. Post-installation and perhaps baseline energy use is predicted using an engineering or statistical analysis of information that does not involve long-term measurements. Data from the estimates may come from historical data, information from other similar projects, and/or spot or short-term metering before and after ECM or system installation during the first year of operation. Spot savings is the easiest and least expensive method of determining savings.

Option A includes procedures for verifying that:

- Baseline conditions have been properly defined.
- The equipment and/or systems that were contracted to be installed have been installed.
- The installed equipment/systems meet contract specifications in terms of quantity, quality, and rating.
- The installed equipment is operating and performing in accordance with contract specifications and is meeting all functional tests.
- The installed equipment/systems continue, during the term of the contract, to meet contract specifications in terms of quantity, quality, rating, operation, and functional performance.

This level of verification is all that is contractually required for certain types of performance contracts. The potential to generate savings may be verified through observation, inspections, and/or spot/short-term metering conducted immediately before and/or immediately after installation. Annual (or some other regular interval) inspections may also be conducted to verify an ECM's or system's continued potential to generate savings. Savings potential are quantified using computational methods.

Option B-Measured Specific Savings

Verification techniques for Option B are designed for projects in which short term or long-term/continuous measurement of performance is desired. Under Option B, individual loads are either measured via short term or continuously monitored after ECM or system installation to determine performance. This measured performance is compared with a baseline model to determine savings. Option B relies on the direct measurement of end uses affected by the retrofit.

Option B is for projects in with more complex ECMs (than Option A), which can be isolated. The savings must be verified and the actual energy use during the contract term needs to be measured for comparison with the baseline model for calculating savings. Option B:

- Confirms that the proper equipment/systems were installed and that they have the potential to generate predicted savings.
- Determines an energy (and cost) savings value using measured data taken throughout the contract term.

Methods involve the use of post-installation measurement of one or more variables. The use of periodic or long-term measurement accounts for operating variations and will more closely approximate actual energy savings than the use of Option A.

Schedule D
Compensation to Company and Deliverables

Total compensation for each energy conservation measure is as follows:

BUILDING AND ECM	ANNUAL SAVINGS (Elec. and O&M)	FPL REBATES	COST
ECM 1- Lighting Retrofits	$809,351	$33,215	$6,046,925

The company shall deliver an Investment Grade Energy Audit, all necessary engineering, specifications and permits, equipment and labor for a complete installation of above items. The company shall deliver signed and sealed drawings, "as builts", training, commissioning and Measurement and Verification necessary to comply with this contract and the State of Florida applicable Energy Performance Contracting requirements.

The Overall Project Cashflow is shown on the following page, in the Energy Audit Report. It is based upon an indicative rate reflecting the market conditions as of May 7, 2009. The rate is subject to change based upon market conditions, formal lender quotes and final lender approval of the transaction. Final rate will be set upon receipt of lender commitment and confirmation of a closing date.

It is understood by both parties that if the terms of the financing vehicle are substantively different than the previous financing vehicles provided and such terms are unacceptable to the County, or if a lender willing to provide an acceptable financing vehicle cannot be located, the County may choose not to proceed with this contract, at which time the County will be freed of any costs incurred by the Company in connection to this contract.

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Project Cash Flow, MDAD/MIA Terminal Phase II

Fiscal year

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Totals
ESTIMATED SAVINGS															
Energy Savings (all ECMs)	$614,743	$627,036	$639,579	$852,371	$865,418	$878,726	$892,301	$706,147	$720,270	$734,675	$749,369	$764,356	$0	$0	$8,244,994
Material Savings (Lighting- Lamps)	$145,570	$145,570	$145,570	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$436,710
Material Savings (Lighting- Ballasts)	$49,038	$49,038	$49,038	$49,038	$49,038	$49,038	$49,038	$49,038	$49,038	$49,038	$0	$0	$0	$0	$490,380
Sub-Total	$809,351	$821,646	$834,187	$701,409	$714,456	$727,764	$741,339	$755,185	$769,308	$783,713	$749,369	$764,356	$0	$0	$9,172,084
Total Savings	$809,351	$821,646	$834,187	$701,409	$714,456	$727,764	$741,339	$755,185	$769,308	$783,713	$749,369	$764,356	$0	$0	$9,172,084
EXPENSES															
Financed Cost	($808,351)	($820,646)	($833,187)	($700,409)	($713,456)	($726,764)	($740,339)	($754,185)	($768,308)	($782,713)	($580,133)	$0	$0	$0	($8,228,492)
TOTAL EXPENSES	($808,351)	($820,646)	($833,187)	($700,409)	($713,456)	($726,764)	($740,339)	($754,185)	($768,308)	($782,713)	($580,133)	$0	$0	$0	($8,228,492)
NET ANNUAL CASH FLOW	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$169,236	$764,356	$0	$0	$943,592
Construction Buydown															
CUMULATIVE CASH FLOW	$1,000	$2,000	$3,000	$4,000	$5,000	$6,000	$7,000	$8,000	$9,000	$10,000	$179,236	$943,592			$943,592
EARNINGS	$48,073														
TOTAL CUMULATIVE CASH FLOW INCLUDING EARNINGS	$49,073														

Notes:
(1) Rebate amount is applied as a reduction to the cost of the project (paid to FPL)
(2) Project duration is 18 months.
3) IDC reflects interest during construction only. Earnings are not used to buydown IDC but rather are made available as part of year 1 cash flow to cover payments.
4) Cost of capital is indicative rate subject to market conditions and lender approval.

Assumptions

Project	Cost	Annual Elec. Savings
ECM 1 Lighting Retrofit	$6,080,140	$614,743
ECM 1 Material Lamp Savings	$0	$145,570
ECM 1 Material Ballast Savings		$49,038
ECM 2 Solar PV	$0	$0
Sub-Total	$6,080,140	$809,351
Rebates (1)	($33,215)	$0
Subtotal	$6,046,925	$809,351
IDC	$ 484,995	
Total (all ECMs)	$ 6,531,920	$809,351
Construction Buydown	$ -	
Total Project Cost	$6,531,920	$809,351

Cost of capital:	4.95 %
Earnings Rate	1.00 %
Annual energy /water escalation	2.00 %
Annual maint/refrig escal	3.00 %
Finance term	11 years

Schedule E
Baseline Energy Consumption

To determine the lighting kW and kWh for the facilities, a combination of room by room walk-downs, kW measurements, foot-candle readings and Excel spreadsheets were utilized. The first step was to conduct the site visits and perform the walk-downs. The second step was to input the data into the Excel spreadsheets to calculate the existing and adjusted baseline kW/kWh, the retrofit kW/kWh and the kW/kWh savings. In addition, photometric analyses were performed to predict the future light levels. Once the kW/kWh savings were determined, the equivalent dollar savings were calculated using an average electric rate based on the previous 12 month usage. Finally, material savings for the quantity of lamps/ballasts and the reduction in HVAC load due to more efficient lighting were calculated.

The walk-downs consisted of gathering the data on the fixture types, quantity, terminal and concourse occupancy, existing light levels, run hours and retrofit types. The fixture types and quantities were then input into Excel, along with unique room/ terminal/ concourse identifiers. In addition, the wattages were input based on a comparison of the manufacturer data and the sample measurements, with the retrofit based on achieving kW savings while increasing the light levels to the DGM levels wherever possible, without exceeding the existing circuits' power limits. Once input, the spreadsheet calculated the fixture by fixture results, with all rows summed for the total.

Because the existing light levels are currently below the DGM requirements in many areas, the ECM 1 – Lighting Retrofit savings are based on an "Adjusted Baseline" method. This method accounts for the increase in existing kW and energy usage (kWh) that would exist if all the existing lights functioned properly and MDAD had installed sufficient lights over the years to meet the DGM requirements. First, the "Adjusted Baseline" was calculated by assuming all existing lights were functioning as intended. This "baseline" was then increased by determining the difference in the existing light levels with the light levels required by the DGM and converting it to equivalent wattage based on the existing technologies. Once the equivalent wattages were calculated, they were added to the non-adjusted baseline to obtain the new "Adjusted Baseline." The ECM scope was then defined so that power and energy savings would be achieved while improving the light levels to meet the DGM light level requirements wherever possible.

For the material savings, an equivalent material cost for a one time change-out of the lamps and ballasts was calculated. In a discussion during the January 16, 2007 review meeting with MDAD and MD GSA, it was agreed that the one time lighting material credit is to be based on 50% of fluorescent lamps/ballasts, 100% of MV lamps/ballasts and 100% of compact fluorescents. The lamp material savings will be spread out over three years and ballasts over ten years. This represents the savings that the MDAD achieves from the lighting retrofit by not having to implement an in-house lighting/ballast replacement program.

For the HVAC reduction savings, due to more efficient lighting systems, thus less heat released, the savings were calculated based on the kWh savings and ASHRAE calculations methods

The table below summarizes the results of the Modeling Analysis.

Existing Baseline Lighting Analysis

Building or Zone	Existing Monthly Demand (kW)	Existing Annual Consumption (kWh)	Equivalent Average Run Hours
Terminal A	304.83	2,457,476.27	5,889
Terminal B	113.57	830,416.09	6,086
Terminal C	35.71	205,975.07	5,310
Terminal E	379.77	2,977,197.60	6,048
Concourse E	261.75	2,103,862.86	6,049
Satellite E	277.28	2,038,669.58	5,167
Terminal F	60.78	459,077.42	6,113
Concourse F	212.36	1,603,089.65	5,831
Terminal G	80.28	680,584.29	4,479
Concourse G	103.57	592,065.80	5,710
Terminal H	9.59	76,835.92	5,427
Concourse H	131.15	786,533.74	5,014
Total	**1,971**	**14,811,784**	**N/A**

Schedule F

Savings Calculation Formula; Methodology to Adjust Baseline

Cost Savings under this Contract shall be determined according to the following formula:

Cost Savings = (Baseline Costs – Post Installation Costs) ± Adjustments

The following definitions and methodologies shall apply:

A. **Baseline Costs.** The estimated costs of fuel, energy or water consumption or wastewater production that would have been incurred if the CMs had not been installed or implemented. Baseline Costs shall be the product of (i) the Baseline amounts set forth in Exhibit H; and (ii) the Utility Rates as defined below.

B. **Post-Installation Costs.** Post-Installation Costs shall be the cost of fuel, energy or water consumption or wastewater production resulting from the installation and implementation of the CMs. Post-Installation Costs shall be the product of (i) the actual amount of fuel, energy or water consumption or wastewater production during the applicable time period, and (ii) the Utility Rates as defined below; together with

- the stipulated operation and maintenance cost savings resulting from the implementation and installation of the CMs. These cost savings have been negotiated and agreed upon by the parties and there is no need to verify the agreed savings.

Methodology to Adjust Baseline

Option A – Spot Measured Savings

The verification techniques for Option A determine savings by measuring the capacity or efficiency of a system before and after a retrofit and by multiplying the difference by an agreed-upon or "stipulated" factor, such as hours of operation or load on the system. Option A is best applied to individual loads or systems within a building, such as a lighting system or chiller.

Option A is an approach designed for projects in which the potential to generate savings must be verified, but the actual savings can be stipulated based on the results of the "potential to generate savings" verification and engineering calculations (and perhaps on short-term data collection). Post-installation energy use is not measured throughout the term of the contract. Post-installation and perhaps baseline energy use is predicted using an engineering or statistical analysis of information that does not involve long-term measurements. Data from the estimates may come from historical data, information from other similar projects, and/or spot or short-term metering before and after ECM or system installation during the first year of operation. Spot savings is the easiest and least expensive method of determining savings.

Option A includes procedures for verifying that:

- Baseline conditions have been properly defined.
- The equipment and/or systems that were contracted to be installed have been installed.
- The installed equipment/systems meet contract specifications in terms of quantity, quality, and rating.
- The installed equipment is operating and performing in accordance with contract specifications and is meeting all functional tests.
- The installed equipment/systems continue, during the term of the contract, to meet contract specifications in terms of quantity, quality, rating, operation, and functional performance.

This level of verification is all that is contractually required for certain types of performance contracts. The potential to generate savings may be verified through observation, inspections, and/or spot/short-term metering conducted immediately before and/or immediately after installation. Annual (or some other regular interval) inspections may also be conducted to verify an ECM's or system's continued potential to generate savings. Savings potential are quantified using computational methods.

Option B-Measured Specific Savings

Verification techniques for Option B are designed for projects in which short term or long-term/continuous measurement of performance is desired. Under Option B, individual loads are either measured via short term or continuously monitored after ECM or system installation to determine performance. This measured performance is compared with a baseline model to determine savings. Option B relies on the direct measurement of end uses affected by the retrofit.

Option B is for projects in with more complex ECMs (than Option A), which can be isolated. The savings must be verified and the actual energy use during the contract term needs to be measured for comparison with the baseline model for calculating savings. Option B:

- Confirms that the proper equipment/systems were installed and that they have the potential to generate predicted savings.
- Determines an energy (and cost) savings value using measured data taken throughout the contract term.

Methods involve the use of post-installation measurement of one or more variables. The use of periodic or long-term measurement accounts for operating variations and will more closely approximate actual energy savings than the use of Option A.

Option C – Whole Facility

The following describe the formulation of the "Baseline".

G1.1) Occupancy in the Facility

The "Baseline" contains two basic types of information about occupancy in the Facility. The first figure is the total square feet of space believed to have been conditioned in the Facility during the month. The second figure is the number of hours the Facility is believed to have been occupied during the month.

G1.2) "Baseline" Calculations

The following calculations are performed to arrive at a "Baseline" energy consumption for a Facility. They are applied to every type of utility consumption in the Facility covering any portion of a base year month.

G1.2a) Prorate Energy Bills

Utility bills are prorated to obtain calendar month consumption. This is done to match monthly consumption to monthly weather data.

Cm	=	(Cb1/Db1)•(Dz1) + (Cb2/Db2) •(Dz2)
Where:Cm	=	Calendar month consumption
Cbi	=	Billed consumption – bill i
Dbi	=	Billing days – bill i
Dzi	=	Days from this month in bill i

(If no bill or more than one bill is received in a month, this formula does not apply and a daily proration is done. Electric demand is not prorated)

G1.2b) Non-Temperature-Sensitive Consumption

A certain portion of each month's utility consumption is due to base loads (not related to weather). This consumption will be present no matter what the weather conditions and therefore will be separated from the temperature sensitive portion before the weather ratio is computed.

The value is estimated by the following formula and is adjusted if information is available that establishes a more accurate measure of non-temperature-sensitive consumption.

Cn	=	(K)• (C2 + C3) / 2
Where:Cn	=	Non-Temperature-Sensitive Consumption
C2	=	Second lowest Cm from G1.2a, above
C3	=	Third lowest Cm from G1.2a, above
K	=	0.9 if both heating and cooling
	=	1.0 otherwise

For months in which Cn > Cm, set Cn = Cm

G1.2c) Temperature-Sensitive Consumption

All energy is considered either temperature-sensitive or non-temperature-sensitive. If an energy source is used for only heating (or only cooling), then the amount of temperature-sensitive energy consumed is calculated as follows:

Ch = Cm – Cn OR Cc = Cm – Cn
Where:Cm = Monthly heating energy consumption
Cc = Monthly cooling energy consumption
Cm = Monthly prorated consumption from G1.2a, above
Cn = Monthly non-temperature-sensitive consumption
From G1.2b, above

If, however, an energy source is used for BOTH heating and cooling, then heating and cooling energy consumed are estimated by taking the total temperature-sensitive consumption and dividing it up proportionally according to the degree days experienced during that month.
CH = (Cm-Cn) •(DDh/DDt) AND Cc = (Cm-Cn) (DDc/DDt)
Where:CH = Monthly heating energy consumption
Cc = Monthly cooling energy consumption
Cm = Monthly prorated consumption from G1.2a, above
Cn = Monthly non-temperature-sensitive consumption from G1.2b, above
DDh = Heating degree days for the month (selected base)
DDc = Cooling degree days for the month (selected base)
DDt = Total degree days for the month (DDh + DDc)

G1.2d) Ratios of Consumption per Degree-Day.

To determine how energy consumption relates to weather, the program forms monthly ratios, which compare temperature-sensitive consumption to the heating (or cooling) degree-days, experienced during the calendar month. The degree-days used in this ratio are not standard degree-days (based on 65 degrees F). Instead, they are based on a break-even (equilibrium) temperature chosen to best model this energy source's weather-sensitive behavior.

Rh = Ch/DDh AND Rc = Cc/DDc
Where:Rh = Monthly ratio of heating energy consumed per heating degree-day.
Ch = Monthly heating energy consumed
DDh = Heating degree days experienced this base year monthly
Rc = Monthly ratio of cooling energy consumed per cooling degree day
Cc = Monthly cooling energy consumed
DDc = Cooling degree days experienced this base year month

For any base year month in which there were fewer than 30 heating (cooling) degree days experienced, these ratios may be unreliable. In such months, an average ratio is determined by dividing the total heating (cooling) energy consumed in the base year by the total heating (cooling) degree days experienced during the base year. The monthly non-temperature-sensitive consumption and heating (cooling) energy consumed are then adjusted to reflect this average ratio.

When electric demand is included in savings calculations, it is considered totally non-temperature-sensitive (i.e. Demand will not be weather adjusted).
For each month being evaluated, the "Baseline" month is adjusted to reflect changes in weather, occupancy, equipment and other critical variables. This adjusted "Baseline" represents the amount of each energy type the facility would have consumed if the ECMs had not been implemented. Energy savings is the difference between the ECM post-retrofit period consumption and the monthly adjusted base period consumption.

Energy cost savings is the result of applying the appropriate Unit Energy Costs to the calculated energy savings. Total dollar savings is the sum of the energy cost savings from each energy type plus any other applicable savings as identified in the attachment(s).
The following describe the energy/utility savings calculations.

G1.3) Effect of Weather Differences

Current month degree-days are multiplied by the "Baseline" weather ratios to determine the current month temperature-sensitive consumption. Then the non-temperature-sensitive consumption is restored.

$Cpw = Cn + (DDh) \bullet (Rh) + (DDc) \bullet (Rc)$
Where: Cpw = Weather adjusted base month consumption
Cn = Non-temperature-sensitive consumption from Baseline.
DDh = Heating degree days experienced this calendar month.
Rh = Monthly ratio of heating energy consumed per heating degree day.
DDc = Cooling degree days experienced this calendar month.
Rc = Monthly ratio of cooling energy consumed per cooling degree day.

G1.4) Effect of Changes in Building Use

Base month data is adjusted for changes in occupied hours, conditioned square footage and equipment before savings are computed.

Cp = (Cpw)•{[Am# + (G)•(Vm#)] / {Am + (G)•(Vm]}•{[Om# + (F)•(Um#)] / [Om + (F) •(Um)]} + Cx
Where: Cp = Final adjusted base month consumption after adjusting for occupancy, area and equipment changes.
Cpw = Weather adjusted consumption from G1.3, above.
Am# = Average area conditioned in current month.
Vm# = Average area unconditioned in current month.
G = Factor relating consumption in vacant areas to consumption in occupied areas.
Am = Average area conditioned in base month.
Vm = Average area unconditioned in base month.
Om# = Occupied hours in current month
Um# = Unoccupied hours in current month.
F = Factor relating consumption during unoccupied hours to consumption during occupied hours.
Om = Occupied hours in base month.
Um = Unoccupied hours in base month.
Cx = Consumption attributable to equipment changes between base and current months.

In the event of major changes in building envelope or usage, it may be appropriate to use calculations other than those described above in order to accurately compute the energy consumption savings. If THE COMPANY may determines that alternative calculations should be used ,it shall inform COUNTY of such calculations.

G1.5) Prorate Current Energy Bills

As with base month bills, current month bills are prorated to obtain calendar month consumption.

Cm# = (Cb#1/Db#1)•(Dz#1) + (Cb#2/Db#2)•(D2#2)
Where: Cm# = Calendar month consumption
Cb#i = Billed consumption – bill i
Db#I = Billing days – bill i
Dz#I = Days this month in – bill i

(If no bill or more than one bill is received in a month, this formula does not apply and a daily proration is done).

G1.6) Energy Savings

Energy units saved is the difference between the "Baseline" adjusted base month consumption and the actual ECM post-retrofit consumption.

Es = Cp – Cm#
Where: Es = Energy units saved
Cp = Final adjusted base consumption from G1.4, above
Cm# = Current month prorated consumption from G1.5, above.

G1.7) Energy Cost Savings

Energy cost savings is determined by applying the appropriate unit cost of energy to the energy units saved. The unit cost is the then current prevailing cost per unit.

$s = (Es) • ($m)
Where: $$ = Energy cost savings
Es = Energy Units saved from 6, above
$m = Unit cost of energy

Due to the nature of electric demand, it is inappropriate to do prorating or degree day adjustments on demand data. Demand savings are calculated by subtracting current period billing demand from base period billing demand and adjusting for miscellaneous equipment changes. The appropriate unit demand cost is then applied to obtain dollars saved.

Schedule G
Construction and Installation Schedule

An overview of the Construction and Installation Schedule is shown below. Start and Finish dates are representative only and are dependent on date of contract approval by Miami-Dade County.

Description of Task	Days	Start	Finish
MIA Terminal Phase II – ECM Implementation	545d	Mon 5/4/09	Sat 10/30/10
Notice to Proceed (Contract Signed)	1d	Mon 5/4/09	Mon 5/4/09
Arrange Financing	30d	Tue 5/5/09	Wed 6/3/09
Issue Release to Sub Contractors for Services	15d	Thu 6/4/09	Thu 6/18/09
Kick Off Meeting with MDAD	6d	Wed 6/10/09	Mon 6/15/09
ECM 1 Submittals - Lighting Area 1	30d	Mon 6/29/09	Tue 7/28/09
ECM 1 Submittals - Lighting Area 2	30d	Mon 6/29/09	Tue 7/28/09
Submittal Review with MDAD	2d	Mon 6/29/09	Tue 6/30/09
Submittal Approval	2d	Wed 7/29/09	Thu 7/30/09
Material Order	45d	Fri 7/31/09	Sun 9/13/09
M&V Pre Measurements	14d	Fri 7/31/09	Thu 8/13/09
ECM 1 - Lighting	240d	Sat 9/19/09	Sun 5/16/10
Area 1	130d	Sat 9/19/09	Tue 1/26/10
Area 2	130d	Thu 1/7/10	Sun 5/16/10
FPL Incentive Verification/Post M&V Meas.	10d	Mon 5/17/10	Wed 5/26/10
Commissioning	10d	Mon 5/17/10	Wed 5/26/10
FPLS Punch List	10d	Tue 6/1/10	Thu 6/10/10
MD/MDAD Punch List	12d	Mon 6/28/10	Fri 7/9/10
Substantial Completion	7d	Sat 7/10/10	Fri 7/16/10
Training	5d	Thu 7/29/10	Mon 8/2/10
O&M Manuals Submittal	14d	Fri 8/13/10	Thu 8/26/10
Final Acceptance	15d	Wed 9/1/10	Wed 9/15/10
Project Close Out	45d	Thu 9/16/10	Sat 10/30/10

Schedule H

Company's Training Responsibilities

TRAINING PROGRAM

The Company shall provide training to three primary categories of *employees*, within the County organization. This training will be organized to fulfill several requirements, as appropriate to each group: provide general information on the project and the benefits of energy conservation; provide training in the use, operation, and maintenance of equipment installed through our project; and provide ongoing information on the operation of this equipment.

The training program will be directed to the following categories of *employees* within the County:

Building Services Staff

Building Services staff will operate and provide routine maintenance on the equipment installed by the *Company*. It is imperative that they have the information, training, and skills necessary to fulfill these responsibilities, in a manner that ensures the proper and efficient operation of this equipment.

The level of training required varies with the complexity of each ECM. Lighting ECMs, for example, are relatively simple, and will require only general-orientation meetings to introduce staff to the new types of equipment and any special procedures that may be required to effect proper maintenance. Ensuring the proper operation of the energy-management systems, however, will require extensive orientation and classroom instruction, to ensure that County staff is fully capable of performing all of the necessary operational functions. Immediately upon execution of its contract, the Company shall contact County Administrators, to identify the key staff who will participate in each of the planned training activities. A final training plan will be presented to the County for review and approval within 45 days of execution of the contract.

It will be the goal of both parties that all training for Building Services staff be completed prior to the installation and commissioning of the equipment. Where possible, the Company shall include County staff in the project development process, including installation of equipment, to ensure their full familiarity with the completed projects.

The Company may provide some of the training directly or utilize programs provided by equipment vendors and other groups, to ensure that all training requirements are fulfilled.

Specific plans will be formalized upon the final selection of vendors and subcontractors by the Company. *As a minimum, the Company is expected to deliver the following general training:*

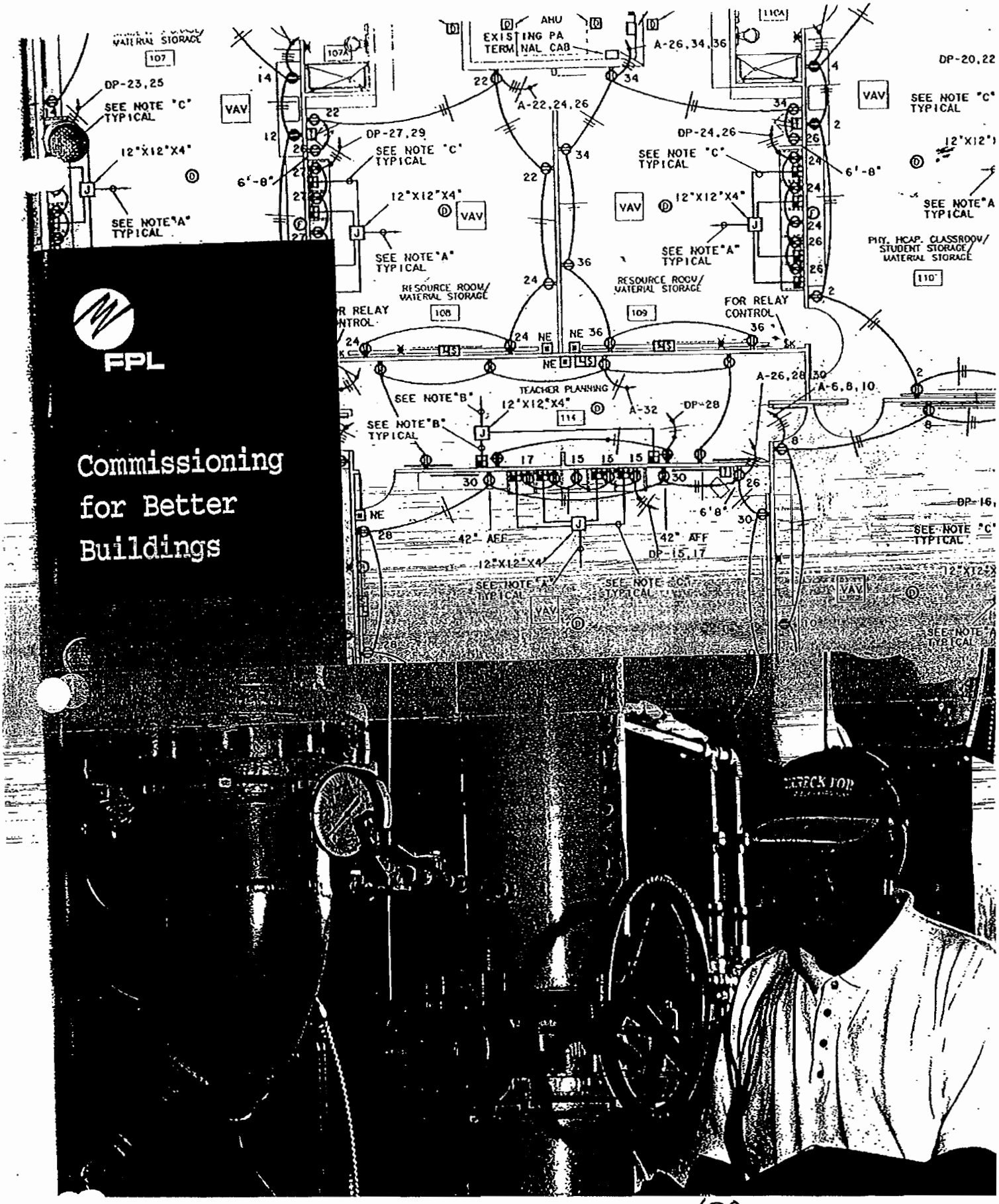
Lighting ECMs: *The Company shall provide* general orientation training to staff members concerned with the operation and upkeep of the lighting systems. *The Company shall provide* vendor-supplied brochures and product information, as well as specialized training to assist staff in the installation of specialized equipment, such as ballasts and exit signs.

MDAD Engineering and GSA Staff

The Company shall also extend opportunities for training and information exchange to GSA/MDAD Engineering and Administrative staff, to foster a common understanding of detailed project objectives, and also to provide staff with the skills and equipment that they will need to directly monitor the operation of the equipment installed in the facilities.

Schedule I
Commissioning

See attached document, "Commissioning for Better Buildings."


FPL
Commissioning for Better Buildings

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WHY COMMISSION YOUR BUILDING?

Introduction

Building owners spend more on complex building systems than ever before, yet many find they are not getting the performance they expect. A recent study of 60 commercial buildings found that more than half suffered from control problems. In addition, 40% had problems with heating, ventilation and cooling (HVAC) equipment and one-third had sensors that were not operating properly. An astonishing 15% of the buildings studied were actually missing specified equipment. And approximately one-quarter of them had energy management control systems, economizers, and/or variable speed drives that did not run properly.

Florida Power & Light Company (FPL) understands that your building is an investment. Poor performance means you may be losing money. Excessive repair and replacement costs, employee absenteeism, indoor air quality problems and liability, and tenant turnover cost U.S. building owners and employers millions of dollars each year. *Building commissioning* is one way to keep this money in your pocket.

Building commissioning can restore an existing building to high productivity. It can ensure that a new building begins its life cycle at optimal productivity, and improves the likelihood that the building will maintain this level of performance. Improving Florida's building stock maximizes our region's (and our customers') competitive edge. We've developed this booklet to help you understand the benefits of building commissioning and explain how the process works.

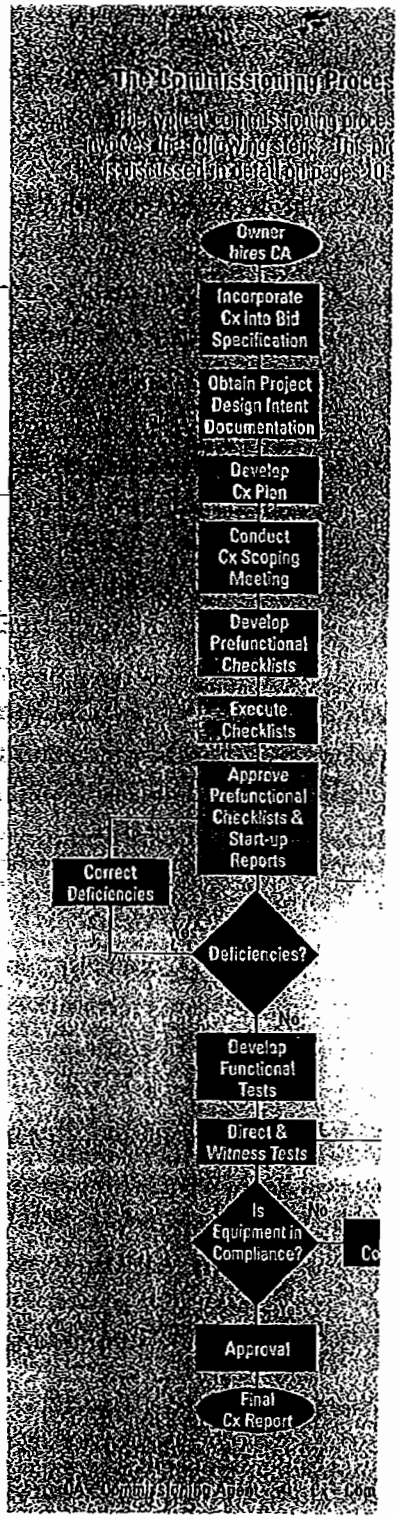
What exactly is building commissioning?

> **Commissioning is a systematic process of ensuring that all building systems perform interactively according to the documented design intent and the owner's operational needs.**

The participants at national conferences on building commissioning have expanded this definition to read:

> Commissioning is a systematic process – **beginning in the design phase, lasting at least one year after project close-out, and including the training of operating staff** – of ensuring, through documented verification, that all building systems perform interactively according to the documented design intent and the owner's operational needs.

Commissioning occasionally is confused with testing, adjusting and balancing. Testing, adjusting and balancing measures a building's air and water flows, but commissioning involves functional testing to determine how well mechanical and electrical systems work together. Functional tests of equipment and systems also help determine whether the equipment meets operational goals or whether it needs to be adjusted to increase efficiency and effectiveness. Commissioning results in long-term tenant satisfaction, lower energy bills, avoided equipment replacement costs, and an improved profit margin for building owners.



Benefits of Building Commissioning

Until recently, the most frequently mentioned benefit of commissioning was its energy-related value. The energy savings and improved performance expected from facility upgrades are ensured by building commissioning. While this benefit is significant, it is far outweighed by the non-energy-related benefits of commissioning. These include:

- Improved indoor air quality, occupant comfort, and productivity
- Decreased potential for indoor air quality-related liability
- Reduced operation and maintenance and equipment replacement costs.

Improved Indoor Air Quality, Comfort and Productivity

Surveys indicate that comfort problems are common in many U.S. commercial buildings. A recent Occupational Safety and Health Administration (OSHA) report noted that 20-30% of commercial buildings suffer from indoor air quality problems. Building occupants complain of symptoms ranging from head-aches and fatigue to severe allergic reactions. In the most severe cases, occupants have developed Legionnaire's disease, a potentially fatal bacterial illness. The National Institute of Occupational Safety and Health surveyed 350 buildings with deficient

indoor air quality and found that more than half of the complaints stemmed from improperly maintained HVAC systems.

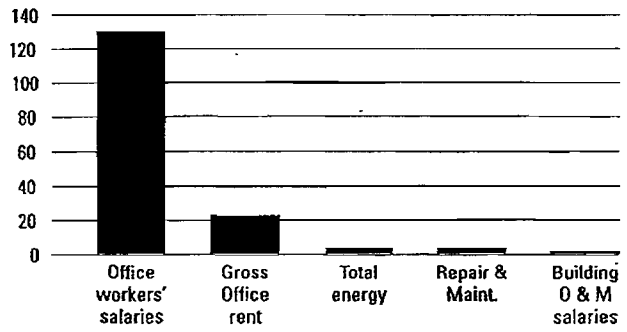
Although little research has been completed to document the link between comfort and productivity, common sense tells us that comfortable employees are more productive than uncomfortable employees. The few studies that have been conducted on this topic agree. In Table 1 is an estimate of productivity losses in a typical office building where occupants complained of discomfort:[1]

Table 1. Comfort and Productivity

Payroll costs	$150/square foot/year
Productivity lost to complaint time	$.10/square foot/year

This example assumes that this typical building has one occupant per 200 square feet of space and an annual payroll cost of $30,000/person or $150/square foot of office space. If one out of every five employees spends only 30 minutes a month complaining about the lighting or the temperature or both, the employer loses $.10/square foot in annual productivity. For a 100,000 square foot building, this amounts to $10,000 per year. And, because uncomfortable employees probably spend more than just half an hour each month complaining about building comfort, actual losses would likely be higher. If comfort problems are severe enough to make employees ill, business owners sustain additional productivity losses to cover sick time. Building operation costs also increase, as operators respond to more tenant complaints. Figure 1 below shows a typical allocation of operating costs in a 140,000 square foot office building.

Figure 1. Operating Costs for a 140,000 square foot Office Building (1990 $/rentable square feet).[2]



Commissioning also improves process productivity especially in industrial facilities. By ensuring that equipment performs optimally and efficiently, commissioning can help reduce equipment downtime and improve production rates.

These problems do not only concern building owners who occupy their buildings. They effect owners who rent building space as well. How long will tenants who are experiencing comfort and productivity problems remain tenants? Tenant turnover can be costly, according to Table 2, below, which estimates the cost of losing a tenant in a Class A building (an urban, highrise, commercial office building).[3]

Assuming an average office size of 3,500 square feet, rented at $15/square foot a year, a typical five-year lease has a value of $262,500. If a tenant leaves, this space will remain vacant an average of six months, for a total rent loss of $26,250. Improvements and build-outs to satisfy a new tenant usually run $15-$20/square foot, or $52,500-$70,000 in this case. On top of all this, the building owner often pays a leasing commission of 5% of the five-year lease value, or $13,125. Thus, the total cost of losing one tenant could run from $91,875 - $109,375, or 35-42% of the five-year lease value. If a building develops a reputation for being uncomfortable and unproductive, the vacancy period could last longer. Word of uncomfortable building conditions is likely to spread among business peers; market research shows that dissatisfied customers, in this case tenants, are likely to complain to 7-10 of their peers.

Table 2. Cost of Losing a Tenant

Five-year lease value	$262,500
Rent loss due to vacancy	$26,250
Improvements for new tenant	$52,500 - $ 70,000
Leasing commission	$13,125
Total cost of losing tenant	$91,875 - $109,375

Building commissioning is one tool building owners can use to avoid the expenses and productivity losses associated with poor indoor air quality and employee discomfort. Because commissioning assures that HVAC and other building systems are installed and operating properly, when new buildings are commissioned these problems are prevented. In existing buildings, commissioning detects current and potential indoor air quality/comfort problems and helps identify solutions.

Indoor Air Quality-Related Liability

Sick building syndrome and the court cases associated with it continue to make headlines across the country. In fact, the government of Polk County, Florida recently won nearly $26 million in damages for problems with its "sick" courthouse. Although the award was paid by the general contractor, many building owners are feeling the sting of indoor air quality-related lawsuits brought by occupants who complain of illnesses resulting from building air quality. And even when owners are on the receiving end of litigation settlements, they and their tenants still suffer the inconvenience of acquiring other work space for use during the repair process, not to mention the inconvenience of the litigation process itself, which can drag on for months and even years.

Building commissioning protects owners in more than one way. First, it provides documented verification of a building's performance and operation. Owners should request that the commissioning process include testing of ventilation levels, a primary factor affecting indoor air quality. If an existing building has deficiencies, the commissioning agent also records the repairs made. Because commissioning is repeated throughout the life of a building, performance documentation is updated regularly. This documentation provides owners with a record of building performance that can be used as evidence in the event of a lawsuit.

Commissioning also helps prevent many indoor air quality problems through its focus on training building operators in the proper maintenance of building systems. Properly run and maintained HVAC systems, with clean coils and air intakes and regularly changed filters, are less likely to contribute to indoor air quality problems. In addition, trained operators can spot potential air quality and ventilation problems before they develop.

Reduced Operation and Maintenance and Equipment Replacement Costs

Operation and maintenance and equipment replacement costs always will take up a portion of building budgets. However, more building owners and businesses are realizing that operation and maintenance departments can minimize life cycle costs by changing their practices. That is, proper operation and maintenance can actually save money compared to poor operation and maintenance, and many businesses are reinvesting their operation and maintenance savings in more efficient building systems. The commissioning process establishes sound operation and maintenance building practices and trains operators in carrying them out. (Some of these practices are discussed in more detail in the Operation and Maintenance for Persistence section, beginning on p.26.)

Commissioning also allows building owners to avoid premature equipment replacement costs. Commissioning verifies that equipment is installed and operating properly. Equipment that operates as intended lasts longer, works more reliably and needs fewer repairs during its lifetime. By promoting equipment reliability, commissioning reduces service, energy and maintenance costs. Equipment that operates properly uses less energy, requires fewer service calls, and demands less "crisis maintenance" from onsite staff, allowing them to concentrate on their normal duties.

The Bottom Line

The bottom line is that commissioning improves a building's asset value. Properly functioning buildings with reliable equipment kept in good condition are worth more than their uncommissioned counterparts. Commissioned systems and equipment retain their value longer. There is a higher demand for comfortable, healthy working space that promotes productivity. And systems that function properly use less energy, experience less downtime, and require less maintenance, which saves building owners money.

Costs of Building Commissioning

There is currently no standard method of reporting the costs and savings associated with commissioning. For many projects, commissioning costs were never separated from other project costs. For projects where these costs have been tracked separately, various methods have been used to report them. The table below lists some of the most common methods. No matter which estimation method is used, however, commissioning accounts for only a very small portion of overall construction and renovation budgets.

Table 3. Estimated Commissioning Costs

Commissioning scope	Estimated cost range
Whole building (mechanical*, electrical and automated control systems)	
Commissioning from design through acceptance	0.5 - 1.5 % of total construction cost
HVAC and automated controls system, only	1.5 - 2.5 % of mechanical contract
Electrical system, only	1 - 1.5 % of electrical contract

* Includes HVAC as well as other mechanical systems

Two studies of utility commissioning programs have assessed the costs per square foot of commissioning commercial buildings. Lawrence Berkeley National Laboratory evaluated the cost effectiveness of commissioning for 16 new and existing office and retail facilities

in the Northwest. They found that costs for commissioning the energy-efficient equipment installed in these buildings ranged from $.08 per square foot to $.64 per square foot. The average building size was 53,000 square feet, and the average cost for commissioning the 16 buildings studied was $.23 per sqare foot. Portland Energy Conservation, Inc. assessed the cost of commissioning energy-efficient equipment in seven office and retail buildings in southern California. Commissioning costs for these buildings ranged from $.13 to $.43 per square foot, with an average cost of $.28 per square foot for the seven buildings. Average building size for the buildings studied was 102,000 square feet.

Savings from Building Commissioning

Methods for reporting the savings associated with commissioning vary depending on who is receiving the report. Utilities typically have been interested in determining the kilowatt-hour savings associated with commissioning energy efficient systems and equipment. Building owners, however, are usually more interested in learning how much commissioning will save in annual utility bills and operation and maintenance costs. Just as commissioning costs can vary from project to project, so do the savings. Savings will depend on the scope of the commissioning. Table 4 below shows reported savings for certain types of buildings.

Table 4. The Savings from Commissioning

Building type	$ savings	Energy savings
110,000 sf office	$.11/sf/yr ($12,276/yr)	279,000 kWh/yr
22,000 sf office	$.35/sf/yr ($7,630/yr)	130,800 kWh/yr
60,000 sf high tech manu.	$.20/sf/yr ($12,000/yr)	336,000 kWh/yr

When commissioning is done properly, the savings can be quite substantial. "Deciding the Appropriate Level of Commissioning" on page 16 contains valuable information on how to maximize your savings from commissioning by determining the appropriate level of commissioning for your building systems.

Commissioning Case Studies

Building 200: Florida Solar Energy Center

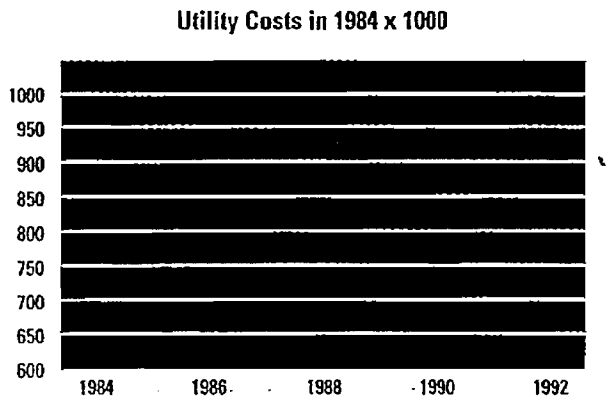
Building 200 is a small 5,000 square foot building at Florida Solar Energy Center's Cape Canaveral facility containing 29 private and suite offices. The 20 year old lighting system consisted of two and four tube fluorescent fixtures with T-12 lamps with magnetic ballasts. The annual lighting energy use in the building was approximately 12,509 kWh. The building owner was interested in inexpensive and potential retrofit technologies to reduce lighting energy use. Occupancy sensors appealed to building managers, and in September 1994 twenty-three lighting sensors (a combination of passive infrared sensors and ultrasonic sensors) were installed to reduce lighting energy use.

After the installation, the building's lighting system was metered using a multi-channel data logger which automatically sent data to a mainframe computer via modem each evening. During the first four months after installation, the building showed average daily weekday energy savings of approximately 7%. However, data revealed power use at odd late evening and early morning hours when the building was unoccupied. Some of this consumption was the result of malfunctioning sensors which were replaced with models less prone to error, resulting in a significant reduction of the problem. One commissioning activity in Building 200 was to reduce the time delays in the occupancy sensors to 7 minutes. The average daily weekday energy savings increased to 19% and had a final annual energy savings of 2,580 kWh (which is equivalent to a 20% reduction in lighting energy costs). Thus, proper commissioning of occupancy sensors emerged as a key issue in achieving reasonable performance.

Westin Hotels and Resorts

Westin Hotels and Resorts, which manages hotels throughout the United States and internationally, commissions all of its new hotels and has also begun to commission some existing facilities. The hotel industry sells personal environments that must be comfortable and safe. Return business is vital to corporate profits, so customers must be satisfied with their first stay at a Westin facility. This, in addition to the desire to reduce energy and equipment repair costs, led Westin to begin commissioning its buildings. One of its most successful commissioning projects to date is the 865-room, full-service, luxury hotel in Seattle, Wash. An estimated $100,000 (in 1983 dollars) investment in commissioning at this 800,000 square foot site resulted in significant energy savings (see Figure 2, next page). From 1984 to 1992, annual energy costs dropped $300,000 a year. In addition, commissioning this hotel alleviated severe occupant comfort problems, HVAC system deficiencies, indoor air quality problems, elevator malfunctions, and fire/life safety hazards.

Figure 2. Westin Energy Costs after Commissioning



Gus Newbury, who manages engineering services for all of Westin's hotels and resorts, sums up the firm's commitment to commission its buildings: "Without commissioning, we have no guarantee that our design intent is being met."

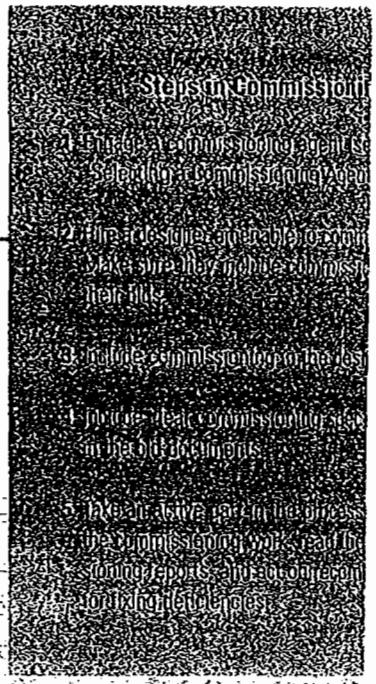
Children's Hospital Research Laboratory

The 3,983 square foot Bone Marrow Research Laboratory at Children's Hospital in St. Petersburg illustrates how essential it is for commissioning to begin during a project's design phase. The lab included eighteen fume hoods, five bio-safety cabinets, numerous test stations, and class-1000 clean rooms. In reviewing the design intent documents, the commissioning agent found problems with the specified chiller system that would have resulted in drastic humidity problems within the lab. A more appropriate cooling system was substituted, avoiding the expensive remediation that would have been necessary if the original system had been installed.

The facility was commissioned to ensure that design criteria, National Institute of Health standards, and the needs of the lab's doctor were met. Energy costs were monitored for the first year following construction, and were 14% below design predictions.

HOW TO COMMISSION YOUR BUILDING

This section outlines the commissioning process and the decisions a building owner must make in order to begin. Remember, the earlier commissioning is incorporated into a new construction or renovation project, the better the cost-benefit ratio will be. It's easier – and cheaper – to make changes on paper during the design phase than on the site once the project is under way.



Selecting a Commissioning Agent

One of the most important commissioning decisions a building owner can make is selecting the commissioning agent. To find a commissioning agent, call engineering and project-management firms in your area and ask for recommendations. (This task could be assigned to your architect or design engineer.) Request statements of qualification from the recommended commissioning agents. If your architect or design engineer is not experienced in commissioning, ask one of the agents to develop a sample solicitation. Be sure to ask about previous, relevant commissioning experience, including the depth of commissioning experience (what some *call* commissioning is no more than traditional startup). Make sure that the agent's definition of commissioning corresponds to the one at the beginning of this booklet. Recommended commissioning agent qualifications are discussed in more detail in the following pages.

Owners have several parties to choose from when selecting a commissioning agent. They include:

- Independent third party
- Design professional
- General contractor
- Mechanical contractor.

Each has its advantages and disadvantages. The final choice may depend on the complexity and the specific needs of the particular project. ***Owners must remember that costs for commissioning services are not included in standard contracts for these parties.***

Independent Third Party

Many owners who have commissioned their buildings recommend using an independent third party (that is, someone who is not otherwise a part of the design-construction team) as the commissioning agent. An independent commissioning agent, under contract to the owner (or to the owner's construction or project manager) rather than the general contractor, can play an objective role and ensure that the owner will truly get the building performance he or she expects. The commissioning agent could work with the owner's project manager. This option offers owners the most objectivity, but also entails higher first costs than some of the other options. For large and/or complex projects, especially in buildings with highly integrated, sophisticated systems, these higher first costs are outweighed by future savings from commissioning.

Selecting an Independent Third Party Commissioning Agent

[illegible]

Design Professional

For projects ranging from 20,000 to 100,000 square feet, using the design professional as the commissioning agent is often a good option, provided that the project specifications detail the commissioning requirements. The advantage of using the design professional as the commissioning agent is that he or she is already familiar with the design intent of the project. This familiarity somewhat reduces first costs. Most design professionals have the ability to write specifications and oversee the commissioning process. However, they may not be very experienced in construction processes and troubleshooting systems. Owners considering this option should bear in mind that commissioning is not included in most design professional fees. Commissioning provisions must be written into the design professional's contract, so that firms can include these services in their bids.

General Contractor

General contractors, provided they have experience with projects of similar size and complexity, have the scheduling

and construction background necessary to supervise a commissioning agent in the quality control manager sense. However, they typically need to hire a commissioning agent to directly supervise tests performed by installing contractors. It has been argued that it is not in the owner's best interest to have the commissioning agent work for the general contractor because of the obvious conflict of interest. On the other hand, because they want to meet project deadlines, general contractors have more of an incentive to cooperate in scheduling and completing the commissioning work. Commissioning often reduces the number of call-backs on a project, and thus improves the general contractor's profit margin. If the commissioning agent will be under contract to the general contractor, it is recommended that the agent be hired as an independent contractor without affiliation to any company on the design or construction team and that the agent report to the owner's representative (usually the construction or project manager).

Mechanical Contractor

It used to be standard practice for many mechanical contracting firms to conduct performance tests and systematic check-out procedures for equipment they installed. As construction budgets became tighter, this service was dropped from most projects. Mechanical contractors certainly have the knowledge and capability to test mechanical equipment. Using them as commissioning agents, however, has been referred to as "letting the fox guard the henhouse." Some contend that it is difficult for mechanical contractors to objectively test and assess their own work, especially since repairing deficiencies found through commissioning may increase their costs. But many owners have good relationships with their contractors, and it may be appropriate to use them as commissioning agents in cases where:

- The project size is less than 20,000 square feet
- One mechanical contractor performs all of the mechanical work on a project
- The project specifications clearly detail the commissioning requirements.

The contractor may be asked by an independent commissioning agent, or a design engineer acting as a commissioning agent, to implement functional performance tests on their equipment. This testing would be observed by the commissioning agent.

Commissioning Agent Qualifications

Although some groups are looking into the possibility of developing a commissioning agent certification, currently there is no standard certification or licensing process for commissioning agents. It is therefore up to each owner to determine the agent qualifications appropriate for a given project.

Regardless of who you choose to act as the commissioning agent, there are certain minimum qualifications any commissioning agent ought to have, and the following list is by no means exclusive. Certain projects may require more or less experience, depending

on size, complexity, and other building characteristics. The commissioning agent chosen should be directed to subcontract work in which he or she lacks sufficient experience.

Roles and Responsibilities of Project Team Members

Members of a design-construction project team, like components of integrated building systems, need to interact in order to perform their tasks successfully. Commissioning facilitates this interaction, because it sets clear performance expectations and requires communication among team members.

The construction project should begin with a commissioning scoping meeting, which all team members are required to attend. At this meeting, the roles of each team member are outlined and the commissioning process and schedule are described. Project team members most often include the building owner or developer, general contractor, commissioning agent, design professionals, contractors, subcontractors and manufacturer's representatives. The team may also include the facility manager and/or building operator, and possibly testing specialists and utility representatives. Ideally, each of these parties contributes to the commissioning process.

Of course, few situations are ideal. Budget considerations and special project characteristics may expand or minimize the commissioning roles and responsibilities described below. Owners should consult with their commissioning agents about potentially combining some of the following roles. The commissioning agent can review the scope of commissioning and advise the owner on how best to consolidate roles and tasks.

Building Owner/Developer

The building owner's most significant responsibility is to clearly communicate expectations about the project outcome. Often the owner is represented by a construction manager or project manager, who is given authority over project budgets and goals. The owner's expectations are used by the designer to establish the design intent of the project and by the

Commissioning Agent Qualifications Checklist

In general, for complex projects, a commissioning agent who will personally develop the commissioning test plans and directly supervise the commissioning work should meet these qualifications.

Recommended Minimum Qualifications

- At least five years experience in design, specification, or installation of commercial building mechanical control systems. Four of these years may be related to general HVAC systems.
- At least four projects involving successful troubleshooting and/or performance verification of buildings of at least similar size as the current project. Experience with new and/or existing buildings, depending on the current project.
- History of responsiveness.
- Meet owner's liability requirements.
- Experience working with project teams and conducting scoping meetings, good communication skills.
- At least two projects involving commissioning of HVAC, mechanical controls, and lighting control systems in buildings of similar size as the current project. This experience includes the writing of functional performance test plans.

Optional Qualifications

- Direct responsibility for project management of at least two commercial construction projects with mechanical costs greater than or equal to current project costs.
- Experience in design, installation and/or troubleshooting of direct digital controls and energy management systems, if applicable.
- Demonstrated familiarity with testing instrumentation.
- Knowledge and familiarity with air/water testing and balancing.
- Experience in planning and delivering O&M training.

commissioning agent to evaluate whether this intent is met. Other responsibilities of the building owner or owner's representative include:

- Hiring the commissioning agent and other members of the project team, preferably using a competitive request for proposal process
- Determining the project's budget, schedule and operating requirements
- Working with the commissioning agent to determine commissioning goals
- Facilitating communication between the commissioning agent and other project team members
- Approving start-up and functional test completion (or delegating this task to a construction or project manager)
- Attending building training sessions when appropriate.

General Contractor

The general contractor assists with the development and implementation of functional performance testing for all systems. This involves assisting in gathering information (for existing buildings this may include shop drawings, operations and maintenance manuals, and as-built documents) for review by the project team. The general contractor facilitates the commissioning schedule by coordinating activities with owner representatives and subcontractors.

Commissioning Agent

The commissioning agent's primary tasks include:

- Developing the commissioning plan
- Writing prefunctional and functional performance tests
- Writing the final commissioning report, including all necessary documentation
- Ensuring that team members understand their specified commissioning responsibilities and fulfill them on schedule
- Submitting regular reports to the building owner or project manager
- Directing all functional performance testing and approving contractor start-up tests, air and water testing and balancing, and duct pressure testing. The commissioning agent may also perform some functional performance tests
- Writing a final commissioning report documenting the final evaluation of the systems' capabilities to meet design intent and owner needs
- Reviewing and commenting on technical considerations from design through construction, in order to facilitate sound operation and maintenance of the building
- Reviewing contractor and manufacturer training plans prior to delivery to operators and facility managers
- Reviewing operation and maintenance manuals and design intent documentation for completeness.

Design Professionals

The primary commissioning responsibilities of design professionals are to document the design intent for all systems and controls and to make sure that commissioning is included in the bid specifications. The designer should also monitor construction activities and review and approve project documentation (shop drawings, operation and maintenance manuals, as-built drawings). For very complex projects, the commissioning agent may ask the designer to review commissioning plans and functional performance tests. The commissioning agent may also ask the designer to visit the site during construction or renovation (beyond the designer's typical construction observation responsibilities) to ensure that work is performed according to plans. If this is the case, the design professional's bid should include funds to cover these visits. As mentioned before, the design professional firm may be responsible for hiring and overseeing the commissioning agent.

Contractors, Subcontractors

Contractors and subcontractors are responsible for performing commissioning functions described in their contract specifications. These may include assisting with developing the commissioning schedule and performance tests, conducting performance tests of the systems they install, adjusting systems where appropriate, and documenting system performance. Contractors and subcontractors are also responsible for training building operators in the proper operation and maintenance of systems and providing operation and maintenance manuals on the equipment they install.

Manufacturers' Representatives

Manufacturers' representatives provide the commissioning agent with manufacturer specifications for the equipment installed. They may also assist contractors with operation and maintenance training and with functional performance testing, especially in situations where warranties may be affected by test results or procedures.

Facility Manager/Building Operator

The building operator should assist with (or at least be present for) as much of the functional testing as possible. This improves operator understanding of equipment and controls strategies. The operator should also attend training sessions arranged by manufacturers' representatives and contractors.

Testing Specialists

If special testing is needed due to project complexity, the specialists performing these tests also should be involved in commissioning. Test results and recommendations from these specialists should be submitted to the commissioning agent for review. They may also be required to review documentation relating to the systems they test and train operators

on the proper use of this equipment.

Utility Representative

FPL has been using commissioning techniques for years to ensure that energy conservation measures perform optimally and provide building owners with expected energy savings. FPL representatives are quite familiar with commissioning practices. If you have been working with a FPL representative on energy efficiency measures for your project, you may want to inform him or her about your intention to commission your facility or installation. FPL has many services and programs that can enhance construction and renovation projects and help you meet your objectives cost-effectively.

If you would like to discuss your building commissioning efforts with an FPL representative, please call 1-800-FPL-5566 today.

Deciding the Appropriate Level of Commissioning

Because commissioning all building systems is rarely practical or even necessary, owners need to determine what level of commissioning is best and most cost effective for their project. Many factors affect this decision, including:

- The complexity of building systems
- Building type and size
- Building usage
- Whether the project is new construction, or the renovation or tune-up of an existing building
- How much the owner is willing to spend
- Building tenant or occupant demographics.

This section includes information about various factors owners should consider when determining the extent of their commissioning efforts.

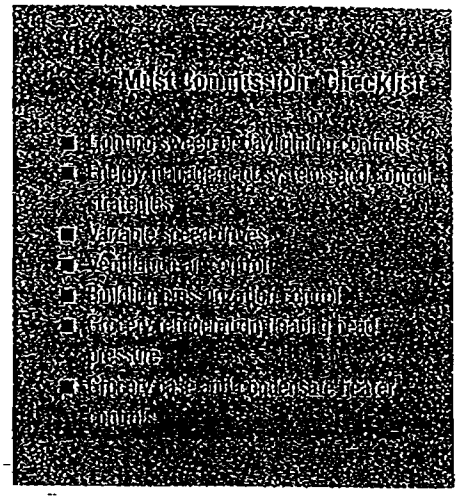
The level of commissioning detail usually is dictated by the complexity of the systems and controls installed. The more complex the project, the higher the risk of systems not performing as intended. Systems that are considered "complex" have:

- Sophisticated controls and control strategies
- Complicated sequences of operation
- A high degree of interaction with other systems and building equipment.

For example, an upgrade from incandescent lighting to T8 fluorescent lamps with electronic ballasts would not be considered complex, and probably would not need more than an inspection. On the other hand, if the upgrade also included lighting controls (such as sweep controls, occupancy sensors, and daylighting controls), it would be considered complex and would benefit from commissioning. As a general rule, all projects that include controls, energy management control systems, pneumatic equipment, integrated systems, HVAC-related plant equipment and air distribution systems ought to be commissioned.

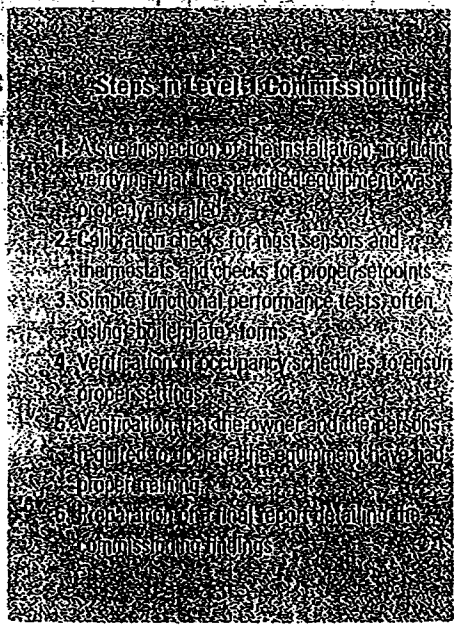
But how much commissioning is enough? Unfortunately, the answer to this question is not straightforward. Certain types of equipment require less commissioning, *under most conditions*, than others. Because every building is different, and because building owners and occupants may have specific building performance needs, there are no hard and fast rules for determining the level of commissioning.

Two levels of commissioning are described below, followed by a table listing various types of equipment and their recommended commissioning levels. Again, these are merely guidelines. Some owners may find that they really need Level 2 commissioning, when the table suggests Level 1 commissioning, and vice versa. In these cases, owners should consult with their commissioning agents to determine the most appropriate level.



Level 1 Commissioning

Level 1 commissioning is a less formal process and requires the involvement of fewer players. Commissioning agents performing this less rigorous form of commissioning may find a "boilerplate" commissioning plan is sufficient, and thus less time and money is spent developing the commissioning plan. During the design phase, the commissioning agent reviews design documents and ensures that commissioning is incorporated into the project specifications. For existing buildings, the commissioning agent may interview building operation staff about maintenance practices, building usage and their concerns.



Level 2 Commissioning

Level 2 commissioning is a more rigorous process that involves more players. The commissioning agent generally develops a customized commissioning plan and conducts a project scoping meeting to review the plan with other players.

As with Level 1 commissioning, the commissioning agent reviews design documentation, interviews building operators (in the case of existing buildings), and ensures that

commissioning requirements are clearly spelled out in the project specifications.

Selecting the Right Level for Your Project

Level 1 commissioning is less expansive, and thus often less expensive, than Level 2 commissioning. However, it also provides less performance assurance. Owners and commissioning agents must find the proper balance between cost and performance assurance before beginning the commissioning process. Owners and commissioning agents can ask the following questions to help determine the complexity of the system or equipment and therefore the need for commissioning.

Place a checkmark in the box by each question where the answer is "Yes".

- ☐ *Is the equipment relatively simple in operation and design?*
- ☐ *Does the equipment operate relatively independent of other equipment and systems?*
- ☐ *Is the investment in the equipment relatively small?*
- ☐ *Is the equipment expected to yield only small energy savings?*
- ☐ *Is the equipment free from adverse operating influences, such as a dirty environment, that affect proper operation?*
- ☐ *Does the equipment have a history of reliable performance?*
- ☐ *Is it difficult for occupants to circumvent or override equipment settings or operation?*
- ☐ *Is start up documentation available?*
- ☐ *Is test and balancing documentation available?*
- ☐ *Are detailed, written specifications available onsite?*
- ☐ *Are operation and maintenace manuals available onsite?*
- ☐ *Is the manufacturer closely involved with the project?*

If an owner or commissioning agent can answer "Yes" to most of these questions, Level 1 commissioning is probably appropriate for the project. Questions in bold, however, are especially critical in determining the appropriate level of commissioning. If you can answer no to any of the first four questions, you should strongly consider Level 2 commissioning. Regardless to your answers to the questions in bold, if even some of the remaining questions are answered with "No," Level 2 commissioning should still be strongly considered.

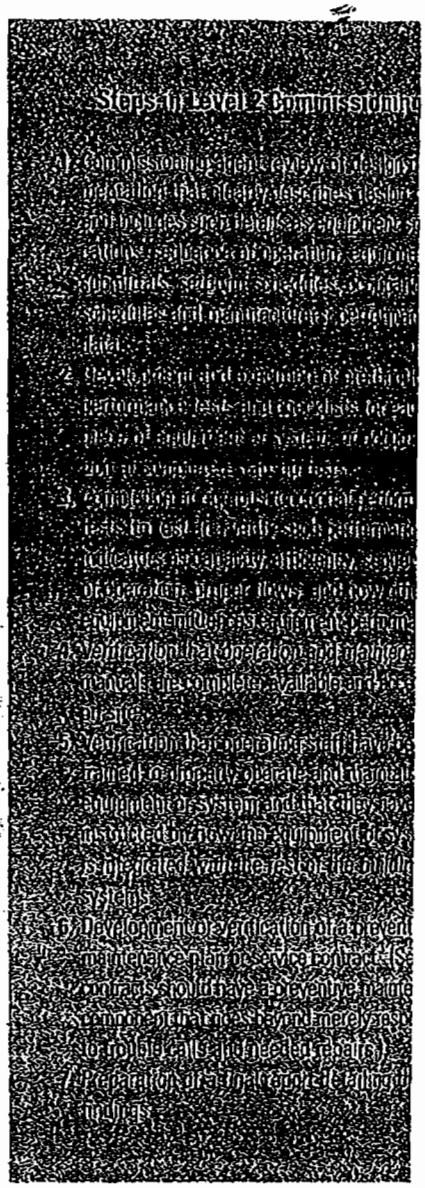


Table 5 provides some general guidelines for selecting commissioning levels for representative equipment. These recommended levels should be evaluated based on your answers to the questions before.

Table 5. Equipment Type and Suggested Level of Commissioning

Equipment type	Equipment name	Level 1 Commissioning	Level 2 Commissioning
Lighting	Lighting timer controls	■	
	Automatic daylight controls		■
	Combination of related equipment		■
	Lighting sweep controls		■
HVAC system	Automatic night setback	■	
	Automatic economizer cooling		■
	Heat pump systems		■
	Outside air control	■	■
	Hot and cold deck reset		■
	Reheat system primary air optimization	■	■
	Heat recovery - HVAC systems	■	■
	Deadband thermostat	■	
	Time clocks on circulating pumps	■	
	Chiller system (chiller, pumps, controls)		■
	Separate make-up air for exhaust hoods	■	
	Variable air volume		■
	Variable speed drives		■
	Direct tower cooling (chiller strainer cycle)		■
	Multiple chiller control		■
	Radiant heating	■	
	Cooling tower flow control		■
	Evaporative cooling		■
	Direct expansion cooling system COP		■
	Building pressurization		■
	Combination of related equipment		■
Domestic water heating	Unoccupied period control of water heater	■	
	Heat pump water heater		■
	Circulating pump control	■	
	Heat recovery - DHW systems	■	■
	Combination of related equipment		■
Power-related	Motors	■	
	Motor control		■
	Combination of related equipment		■
Refrigeration	Optimize defrost controls		■
	Refrigeration pressure optimization		■
	Case anti-condensate heaters	■	■
	High efficiency compressors		■
	Combination of related equipment		■
Miscellaneous	Energy management control system		■
	Combination of related equipment		■

The Commissioning Process

Once you have selected your commissioning agent and determined the level of commissioning your facility needs, you can begin the actual commissioning process. The commissioning process is integrated with the phases of the construction, renovation, and retrofit processes. These include:

- Predesign phase
- Design phase
- Construction/installation phase
- Acceptance phase
- Post acceptance/occupancy phase.

Table 6 shows how these phases correspond to construction and renovation project phase designations.

Table 6. Commissioning Tasks and Project Phases

Commissioning task	Project phase
Predesign ■ commissioning agent hired	**Planning phase** ■ design team chosen
Design ■ develop commissioning plan ■ commissioning scoping meeting ■ design intent documentation submitted ■ tentative design reviewed	**Design phase** ■ building designed ■ bid documents ■ job awarded to general contractor
Construction/installation ■ submitted documentation reviewed ■ develop and execute prefunctional checklists ■ develop functional test plans	**Construction phase** ■ construction of facility ■ equipment startup
Acceptance ■ execute functional tests ■ verify operator training ■ approve operation and maintenance manuals	**Acceptance phase** ■ training completed ■ documentation completed ■ owner accepts building
Post-acceptance/occupancy ■ perform deferred tests (if any)	**Occupancy phase** ■ ongoing operation and maintenance

The following sections briefly describe the commissioning activities associated with each phase of a project, emphasizing the role of the commissioning agent.

Commissioning Phases

Predesign

The predesign phase is the ideal time for the owner to select a commissioning agent. Early selection allows the commissioning agent to play an advisory role during the conceptual process. It can also increase buy-in for commissioning from other team members because the agent is involved from the beginning. Otherwise, the team may view the commissioning agent as an outsider who does not really understand the project.

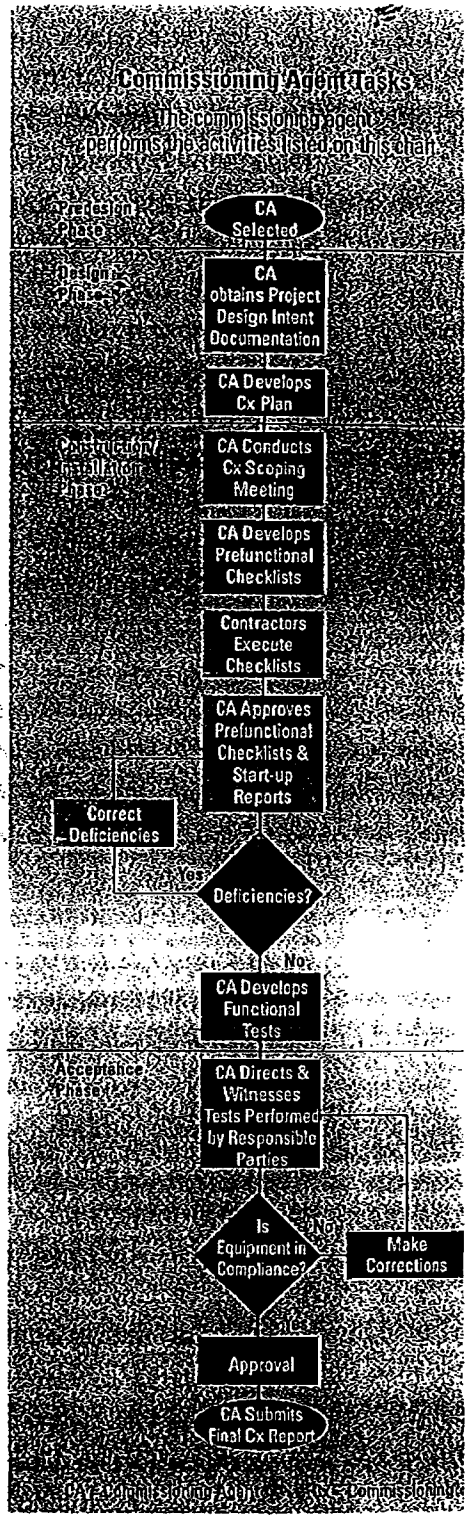
Design

The goal of commissioning during the design phase is to ensure that the efficiency and operational concepts for building systems are included in the final design. The main commissioning tasks during this phase are compiling and reviewing design intent documents, incorporating commissioning into bid specifications, and reviewing bid documents.

The bid specifications developed during the design phase define the design intent of each system and include commissioning plan requirements for the mechanical, electrical and controls contractors. Specifications should include any special equipment or instrumentation that must be installed for obtaining measurements during performance testing. They should also note that contractors will be expected to provide operation and maintenance manuals for equipment installed. (For more details on operation and maintenance manuals, refer to page 26.)

The commissioning agent reviews these bid documents and all other design intent and contract documents. At a minimum, design intent documentation includes:

- Objectives and purpose of each system
- How the objectives will be met
- Indoor/outdoor design conditions
- Occupancy, usage, and schedule assumptions
- Internal loads assumptions
- Zoning descriptions
- Ventilation requirements
- Envelope requirements
- Equipment sizing calculations and criteria



- Maintenance contracts and logs
- All sequences of operation
- Energy efficiency control strategies
- Design intent for all efficiency measures
- Pertinent local or state compliance documents.

The commissioning agent attends design team meetings to review the design and note potential system performance problems. The commissioning agent recommends changes to improve energy efficiency, operation and maintenance, and equipment reliability. Making these changes during the design phase, rather than after construction begins, saves money in the long run.

During this phase, the commissioning agent can also play a significant role in developing a building's operation and maintenance program. The agent interviews the facility manager to determine operating staff ability and availability to operate and maintain building equipment and systems. The commissioning agent also reviews the design documents and drawings to ensure that equipment is accessible for maintenance. In addition, the agent reviews bid documents to ensure that contractors' operation and maintenance responsibilities have been included. In fact, the agent may assist in writing this portion of the bid document. The bid document should specify the requirements for the operation and maintenance manuals and operator training that the contractors will provide. In cases where the commissioning agent has been brought into the project after the design stage and/or operation and maintenance requirements were not included in the original specifications, a change order or addendum to the contract can be issued that details contractor operation and maintenance responsibilities.

Construction/Installation

The commissioning scoping meeting should be held at the beginning of the construction phase. At this meeting, the commissioning agent outlines the roles and responsibilities of the project team members and reviews the commissioning plan outline and schedule. Team members provide comment on the plan and schedule, and the commissioning agent uses these suggestions to complete the final commissioning plan. The final plan will include:

- The scope or level of commissioning
- Commissioning schedule
- Team member responsibilities
- Documentation requirements of each team member
- Detailed scope of testing
- Detailed scope of monitoring
- Recommended training format.

During this phase, the commissioning agent reviews contractor submittals and operation and maintenance manuals and may write test plans for each system and piece of equipment to be commissioned. The agent also visits the construction site and notes any conditions that might affect system performance or operation.

Prefunctional testing, which ensures that equipment is properly installed and ready for functional performance testing, occurs during the construction. The commissioning agent approves and may oversee start-up and prefunctional testing and makes sure that any deficiencies are remedied before functional testing begins. The commissioning agent will also write the functional performance test plan during this phase.

The commissioning agent may write various reports during construction that document testing progress and deficiencies that may affect future building performance. These reports may be submitted to the owner, design engineer, project manager or contractors, depending on the contract arrangements for the project.

Acceptance

The functional performance tests written during the construction phase are modified, if necessary, during the acceptance phase to reflect any changes in installations. The commissioning agent then uses the tests to observe and verify the proper operation of equipment and systems according to the contract documents. Most often, the commissioning agent directs the tests, but actual equipment operation during the tests is performed by subcontractors, particularly the controls contractor. If corrective measures are required, the commissioning agent makes sure that they meet the owner's criteria and the design intent. Acceptable performance is reached when equipment or systems meet specified design parameters under full-load and part-load conditions during all modes of operation, as outlined in the commissioning test plan.

After completing functional performance testing, the agent writes a final commissioning report, which includes all project documentation, and submits it to the owner for review.

The acceptance phase is complete when the facility has moved from the static construction state to the dynamic operating state, and control of the building is transferred from the design/construction team to the owner and building operators. Part of this transfer involves training building operators in the operation and maintenance of equipment and systems. This training should begin at the end of the acceptance phase.

The commissioning agent is responsible for interviewing operation and maintenance staff to determine their training needs. The agent then selects the appropriate topics, level of detail, sequence of training, and training methods. Training should include both classroom sessions and hands-on site demonstrations of proper equipment operation and

maintenance. Any building staff responsible for operating and maintaining complex building equipment, especially energy management systems, should be required to participate in the training.

The commissioning agent coordinates training sessions (which should be specified in the bid documents) that installing contractors, designers and manufacturers' representatives will perform. Typical topics are listed on page 28. The agent verifies that operation and maintenance manuals are complete and available for use during the training. Finally, if modifications to operation and maintenance practices are made based on the training, the agent makes sure that the manuals are updated to reflect these changes.

Post acceptance/occupancy

After acceptance, the building is in the hands of the owner and operators. Even though the project is considered complete, some commissioning tasks continue throughout the life of the building. These tasks include ensuring that equipment and systems continue to function properly and documenting changes in equipment and building usage. It may be appropriate to continue working with the commissioning agent at the beginning of this phase, so the agent can review and recommend methods for carrying out these functions:

If any testing was delayed because of site or equipment conditions or inclement weather, this testing should be completed during this phase.

Owners should consider recommissioning their facilities periodically to ensure that performance levels continue to meet design intent. If building operators have been involved in the original commissioning effort, and if they received training that included the components listed on page 28, they may be able to conduct the recommissioning process themselves.

When Does Commissioning End?

Commissioning ensures that a building is performing as intended *at the time that commissioning occurs*. To maintain this level of performance, commissioning, in a sense, never ends. Certainly no one could reasonably expect building operation staff to perform functional tests on equipment and systems daily. However, operation and management staff should be encouraged to recommission the building on a regular basis, perhaps every 2-3 years depending on building usage and equipment complexity. Your commissioning agent can recommend an appropriate interval for your building and systems. In the meantime, staff should implement sound operation and maintenance practices to ensure that the savings from commissioning last.

OPERATION AND MAINTENANCE FOR PERSISTENCE

To ensure that the benefits gained from commissioning persist over time, sound operation and maintenance practices must be in place. Some of these include:

- Establishing and implementing a preventive maintenance program for all building equipment and systems
- Reviewing monthly utility bills for unexpected changes in building energy use
- Using energy accounting software to track building energy use
- Tracking all maintenance, scheduled or unscheduled, for each piece of equipment Periodic reviews of these documents will often indicate whether certain pieces of equipment require tuning up
- Updating building documentation to reflect current building usage and any equipment change-outs
- Establishing an indoor air quality program for the building
- Assessing operator training needs annually.

Good Operation and Maintenance Begins During Design

Like commissioning, successful operation and maintenance begins in the design phase of a project. Building owners have begun to recognize the importance of soliciting input from operation and maintenance staff during the early stages of building design. Building operation and maintenance staff can make design recommendations that facilitate good operation and maintenance practices. The more convenient it is for staff to perform regular checks and maintenance on building systems, the better building performance needs can be met and costly maintenance can be avoided. Examples of some design recommendations to help simplify operation and maintenance are[4]:

- Provide ground floor access to the chiller room through a connected loading dock
- Provide one or more roll-up doors of sufficient size to permit removal and replacement of chillers without having to disassemble equipment
- Provide sufficient clearance on all sides of the chiller to perform all maintenance
- Install hoist or crane equipment over banks of chillers
- Install sufficient valves to permit the isolation of a particular chiller without having to shut down the entire air conditioning system
- Install walkways around elevated equipment
- Provide roof access with adequate openings via stairs, not ladders.

In addition, during the design stage the installing contractor's responsibilities for operation and maintenance should be clearly detailed in the project contract specifications, so that the contractor can adjust the bid price accordingly. For instance, specifications should explicitly state that contractors will be required to provide operation and maintenance manuals for equipment and training for staff.

Operation and Maintenance Manuals

Operation and maintenance manuals for each piece of equipment are prepared by the contractor. The commissioning agent reviews each manual for compliance with the specifications as part of the commissioning process. Operation and maintenance manuals should contain:

- Product data
- Test data
- Performance curves (for pumps and fans)
- Installation instructions
- Operation requirements
- Preventive maintenance requirements
- Part lists
- Troubleshooting procedures specific to the equipment design and application.

If the agent believes it would be beneficial, additional information, already gathered during the commissioning process, can also be included in the operation and maintenance manuals. This information may include equipment submittals, design intent documents including control strategies and sequence of operations (normal and emergency) and copies of the commissioning tests (pre-functional checklists and functional performance test forms).

When possible, operation and maintenance manuals should be made available over local area computer networks. This allows operators to access and print out information they need, without potential loss of information.

For companies without this capability, the operation and maintenance manuals should be placed in three-ring binders. Contractors should be required to provide at least three copies of each manual. Typically, one master copy remains in the facility manager or engineer's office. The second copy functions as a field copy, and selected pages from it may be removed for use during site work. The third copy resides in the building owner or management firm's office. Some companies have found it beneficial to "hard bind" the master copy, so that pages cannot be removed and misplaced. If building equipment will be maintained and operated by an outside firm, a fourth copy should be provided to them as a reference. Because manuals lose their usefulness if they are not kept up to date, any pages added, such as checklists or preventive maintenance work orders, must be included in each copy.

Operation and maintenance manuals are useful as a reference tool for current facilities staff. They can also be used as a training resource for new staff members.

Training

Perhaps the most essential component of operations and maintenance is training. Unless building operators and managers have the skills to perform quality operation and maintenance practices, there is no hope that a building will continue to perform optimally.

Many companies are focusing on defining the relationship between maintenance and business in order to create management support for maintenance activities. This involves demonstrating to business workgroups the role that maintenance plays in improving equipment effectiveness, product quality, and employee efficiency.

As with all training, instruction should be structured to meet the needs of building operator staff. Training session topics should ideally be specified in the bid documents.

By videotaping each training session, including the hands-on start-up and shut-down procedures for equipment, building operation staff gains a permanent and inexpensive on-site training aid. When new staff are hired, they can view the videos as part of their training.

For buildings where a facility manager without a technical background provides maintenance, the commissioning agent can still coordinate with contractors to ensure that the manager is educated about the capabilities, intended function, and required maintenance of the building systems. This should enable the facility manager to respond to occupant complaints in a manner that does not circumvent the systems' design intent. Training should also include a list of resources for the manager to call for maintenance assistance when necessary.

Once a building is operating and occupied, problems will occasionally develop (usually during the first year of operation after construction or renovation) that were not apparent during the commissioning process. Sometimes the service contractor or operating staff can effectively troubleshoot and solve the problem. However, if a problem becomes chronic (for example, repeated comfort complaints), or if operating staff is unable to solve a problem in a reasonable amount of time, the owner should request expert troubleshooting assistance.

Suggested Training Topics

- Descriptions of equipment and systems installed and their warranties or guarantees
- Equipment start-up and shutdown procedures, operation in normal and emergency modes, seasonal changeover and manual/automatic control
- Requirements and schedules for maintenance on all operation and maintenance sensitive equipment
- Health and safety issues
- Recommendations for special tools and scale parts inventory
- Emergency procedures
- The operation and adjustment of dampers, valves and controls
- Hands-on operation of equipment and systems
- Common troubleshooting problems, their causes and corrective actions
- Review of operation and maintenance manuals and their location onsite
- Building walk-through
- Review of related design intent documents
- Energy management control system operation and programming
- Control sequences and strategies
- Thermostat programming
- Relevant commissioning reports and documents
- When and how to recommission building systems
- The maintenance work order management system
- Sound energy management practices

Because the commissioning agent and design engineer are very familiar with the building systems, the owner may want to consider contracting with one and/or both of them for the first year of operation to provide troubleshooting assistance on an as-needed basis. This contract could be written in a "fee-for-service" or an "amount-not-to-exceed" manner. Owners may find that it is more cost-effective to purchase troubleshooting services from the agent or engineer, because their knowledge of the building systems and design saves them time in diagnosing problems.

In the long run, owners may also find it beneficial to train operation and maintenance staff in energy accounting. In addition to tracking the building's energy use, energy accounting can also indicate when problems or potential problems exist with equipment operation.

Preventive Maintenance

Another important operation and maintenance practice is preventive maintenance. Preventive maintenance can save buildings owners time and money by:

- Maintaining facility operation
- Extending equipment life
- Identifying equipment degradation
- Preventing losses of equipment, time, productivity and resulting revenue

The relationship between a properly maintained and operating facility and higher occupancy rates and profitable building operation does not need much explanation. A properly functioning air conditioning system is no longer a privilege but a necessity. Properly functioning air handling systems are crucial in buildings where indoor environments are directly linked to occupant safety (for example, hospitals) and staff productivity (such as high-rise, enclosed buildings).

When estimating service life, manufacturers usually assume regular preventive maintenance of the equipment and system components. Many preventive maintenance procedures recommended by manufacturers are intended to extend the life of the component and the system as a whole. Lack of preventive maintenance reduces the life of equipment.

Identifying degradation of the system's components is another benefit of preventive maintenance. If the operation and maintenance system in a facility is properly set up and proper reporting and documentation practices are in place, then the incidence of failure will be reduced. For example, if a component of the system is identified as potentially failing to operate as intended, a work order for replacement parts can be set up immediately and work scheduled during unoccupied hours. Preventive maintenance can reduce the number and cost of emergency corrective maintenance bills.

Perhaps the most-cited reason for performing preventive maintenance is the energy savings (which turn into cost savings) that it provides. For example, simply replacing worn fan belts on a regular basis can save 2-4% of the energy used to run the fans. Cleaning air filters and cooling coils regularly can save 1-3% of the building's energy use for cooling.

These basic activities cost very little to perform, but can add up to dramatic savings.

Preventive maintenance also makes buildings safer and can reduce potential liability. Increasingly, building ventilation systems are incorporated into the fire sprinkler and smoke detection systems. A properly functioning air handling system is required to handle smoke and dangerous fumes in case of fire.

Developing a Preventive Maintenance Plan

The commissioning agent can assist the owner or facility manager in developing a preventive maintenance plan for a building's HVAC plant and systems and electrical systems. Most of the information required for developing a preventive maintenance plan has already been gathered as part of the commissioning process or can be obtained from the operation and maintenance manuals.

A preventive maintenance plan consists of a checklist of tasks that are performed at manufacturer-recommended intervals (usually measured in hours of equipment run-time). This checklist is usually kept in the form of a log and updated manually when tasks are performed. (See page 32.) In buildings that use computerized maintenance management systems, the equipment that requires preventive maintenance should be entered into the system. If the computerized system is used for generating preventive maintenance work orders, the system should be updated when work is performed and hard copies of completed work orders should be kept on file.

The preventive maintenance plan for each piece of equipment should include the following fundamental information, gathered during the commissioning process:

- Unique equipment identification number
- Name plate information
- Manufacturer's name
- Vendor's name and telephone number
- Equipment location
- Date installed
- Expected equipment life
- Expected annual energy use.

Preventive maintenance should be performed according to manufacturer requirements. The manufacturer operation and maintenance manual for each piece of equipment should be consulted for requirements such as frequency, chemical treatments, proper lubricants, special tools, etc. This information should also become a part of the preventive maintenance plan.

The preventive maintenance work order form or task list for each piece of equipment should have a verification section with at least two signature lines: one for the technician performing the preventive maintenance and one for the supervisor verifying that the maintenance was performed.

Month of: January 1996 ID: E1-3

Equipment name: Exhaust Fan Location: Bldg 16 Roof

Preventive Maintenance Log

Fan			
Manufacturer	Big Fans Inc		
Model number	BF 727		
Serial number	123444402		
Motor			
Phase	30	Amperage	18
Voltage	460	RPM	1745
Frame size	143 TC	Service factor	125
Horsepower	1hp	Efficient	30
Belt size/ Description	(1) A 44		

Place the date in box when task is completed and state any problems and solutions in the comments.

PM Task	Frequency	Date(s)	Measurement (if applicable)	Initial	Comments
Visual inspection for noise and vibrations	Weekly	1/5, 1/13, 1/19, 1/26		BK	Tighten shroud eliminate noise
Check schedule	Monthly	1/5		BK	
Check belts	Quarterly	1/19		BK	Replaced belt
Check bearings	Quarterly	1/19		BK	
Check by-pass timer function	Quarterly	1/19		BK	
Measure and record amperage for phase A	Quarterly	1/19	12	BK	
Measure and record amperage for phase B	Quarterly	1/19	12	BK	
Measure and record amperage for phase C	Quarterly	1/19	14	BK	
Measure and record voltage phase A to B	Quarterly	1/19	460	BK	
Measure and record voltage phase A to C	Quarterly	1/19	460	BK	
Measure and record voltage phase B to C	Quarterly	1/19	460	BK	
Measure and record voltage phase A to ground	Quarterly	1/19	277	BK	
Measure and record voltage phase B to ground	Quarterly	1/19	277	BK	
Measure and record voltage phase C to ground	Quarterly	1/19	277	BK	

Outsourcing Preventive Maintenance

According to maintenance contracting firms, most office and retail buildings smaller than 50,000 square feet contract out the maintenance services on their HVAC equipment. If a new piece of equipment does not require frequent maintenance, and current staff time is committed, a contract for outside help may be less costly than hiring and training full-time staff. If a sophisticated new piece of equipment is purchased, the cost of training in-house staff should be compared to the cost of hiring a trained outside contractor to perform maintenance on the equipment.

In buildings where operating staff is not available or trained to perform the required preventive maintenance on equipment, owners may obtain a service contract from the vendor, installing contractor, or a maintenance service contractor. The service contract should cover all of the manufacturer's recommended preventive maintenance procedures as described in the operation and maintenance manuals. After each site visit, the contractor should provide an invoice or preventive maintenance form stating clearly which preventive maintenance activities or repairs were performed. The owner or facility manager should keep these forms on site in a file for future reference. Regardless of who actually performs the preventive maintenance, the building owner is responsible for making sure that the preventive maintenance plans are complete.

Maintenance contracts tend to be site-specific. But in general, there are two basic types of services.

Preventive maintenance contract. Normally, this does not cover the cost of replacement parts, but does include labor and supplies. The equipment owner is responsible for parts replacement. The duration of a preventive maintenance contract is usually one year. Frequency of site visits may depend on the equipment being serviced. Corrective maintenance may or may not be included.

Guaranteed service and repair contract. This type is usually offered by large maintenance contractors. Under this arrangement, the contracting firm not only maintains but also replaces failed components. It is essentially an insurance policy with a low deductible, and typically is a multi-year contract. The cost is comparatively high.

Tools for Proper Operation and Maintenance

Regardless of building size, operating staff should have on hand certain tools (in addition to basic hand tools) that enhance their ability to operate and maintain equipment and systems. These tools are relatively inexpensive and are essential for basic troubleshooting. They include:

- *Flashlight* to observe facility conditions and equipment in darkly lit areas.
- *Measuring tape* for measuring distances. Can be used to compare existing conditions to design drawings.
- *Inspection mirror* for observing difficult to reach equipment or nameplate infomation.

- *Temperature meter* for measuring temperatures of both air and liquids.
- *Humidity meter* for measuring the relative humidity of the air. This device can be used to determine whether the measured space is within the "comfort zone"[5].
- *Light meter* for measuring light levels. Operators use this tool to determine whether light levels in occupant spaces are sufficient, or perhaps too high.
- *Multimeter* for measuring volts, ohms and amps. Operators can use the multimeter to troubleshoot electrical problems and detect potential equipment failures. In addition, multimeter adapters are available that can replace individual temperature, humidity and light meter, as well as a number of other measurement devices.

Once these basic tools are available, owners and operating staff may consider adding more sophisticated instrumentation. This is especially true in larger, more complex buildings with in-house operation and maintenance staff. Some companies may be interested in investing in more sophisticated monitoring and software tools.

Monitoring Tools

The following monitoring tools can provide staff with more detailed information about building performance and problems:

- *Data loggers* to provide a variety of measurements over time. Some of the measurements include: equipment hours of operation, temperature, humidity, light levels, occupancy, pressure, voltage and current. These small, portable, easy to use devices are excellent tools for more sophisticated troubleshooting.
- *Anemometer and/or flow hood* for measuring air flow and detecting air balance problems. This tool is especially useful during space changes and remodels.
- *Tachometer* for reading the rotations per minute (rpm) of fans and motors. Operators can check this measurement against the design intent rpm and troubleshoot for air flow problems.
- *Combustion Analyzer* for measuring boiler efficiency. This measurement can indicate whether there are problems with boiler function.
- *Power Monitor* to measure kilowatt demand, kilowatt-hour usage, power factor and troubleshoot electrical problems. This tool is similar to the multimeter, but it provides readings over time rather than spot measurements.

Software Tools

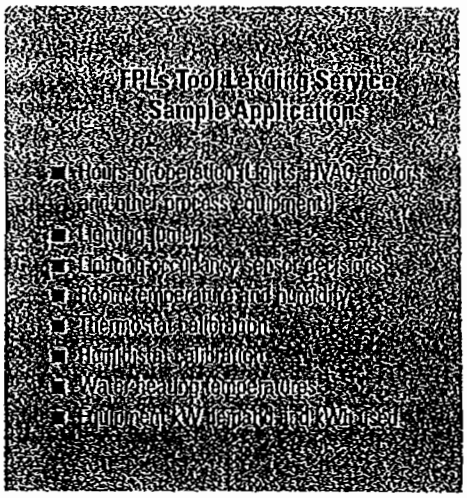
Automated maintenance systems range from computer assistance for planning and scheduling work orders to equipment monitoring and fault diagnosis. The most popular areas of maintenance automation include basic capabilities such as time keeping, cost and energy accounting, work requests, and preventive maintenance planning or scheduling. Software has been developed for automated maintenance systems in varying levels of detail.

FPL's Tool Lending Service

It is not cost-effective for companies to invest in sophisticated measuring equipment that will be used only occasionally, or perhaps even only once. FPL, recognizing that many commercial owners and trade allies value the opportunity to occasionally use these tools and assess their long-term usefulness, has recently developed a tool lending service for its customers. FPL's tool lending service allows customers to "borrow" certain tools for limited time periods. FPL representatives will provide technical assistance and training in the proper use of the tools they lend.

Owners can take advantage of this tool lending service to verify their commissioning savings.

FPL can work with your building operator or your trade allies to program and install available tools and provide you with a read out of the collected information. Call FPL at 1-800-FPL-5566 today to find out more.



APPENDIX 1: SAMPLE PREFUNCTIONAL CHECKLIST

This is a sample prefunctional checklist for a packaged air conditioning system, for use as a "boilerplate" form adapted for specific projects.

Prefunctional Checklist for Packaged Air Conditioning System

General information	
Project name:	Date:
Contact name:	Phone:
Commissioning agent:	Phone:
Contractor:	Phone:

Equipment		
Equipment name		
Type		
Manufacturer		
Model number		
# of identical units		
Equipment Identifier		
ID number	Serial number	Location

- Is the installed equipment what was specified? ❑ YES / ❑ No / ❑ Not Sure

Documentation - available on site? Check all that apply:			
	Manufacturer cut sheets		Installation manual
	Submittals		Water treatment report
	Manufacturer product design data (curves)		Record drawings
	Operation and maintenance manuals		Schedules
	EMCS points list		Balance report
	Hard copy of EMCS program		Written control strategies
	Other (list):		

- Is the documentation complete according to specifications? ❑ YES / ❑ No / ❑ Not Sure

Project name:	Date:

Purpose of the test or checklist:

Equipment description (size, features, capabilities, etc.) if applicable:

Nameplate information (volts, amps, phase, BTUs, efficiency, etc.) if applicable:

Project name:	Date:

General checklist

Check if ok. Enter comment number if deficient, and document comments by number in form provided after checklist.

Checklist item	Equipment identifier			
Casing condition good: no dents, leaks, door gaskets tight?				
General condition appears good				
Attached duct work is properly sealed (boot in good condition)				
Pipe fittings complete and pipes properly supported				
Condensate drain in place and properly trapped				
Protective shrouds for belts in place and secure				
Alignment of motor driven components correct				
Correct refrigerant charge				
Correct oil level (check site gas)				
Compressors and piping was leak tested				
Crankcase heater on when unit is off				
Disconnects in place and labeled				
All electric connections tight				
Proper grounding installed				
Auxiliary heaters operate				
Control system interlocks functional				
Safeties installed (see mfg. information)				
Smoke detectors in place				
All dampers stroke fully and easily				
Dampers close tightly				
Enthalpy control and sensor properly installed (if applicable)				
Related thermostats are installed				
Related EMCS points are installed OSAT, MAT, SAT, RAT sensors properly located and secure				
(OSAT shielded) State which sensors are installed.				
Supply fan belt: tension & condition okay				
Supply fan acceptable noise & vibration				
Supply fan area clean				
Supply fan rotation correct				
Filters clean and tight fitting				
Construction filters removed				
Indoor coils clean and in good condition				
Unit starts and runs with no unusual noise or vibrations				
Condenser fan rotation correct				
Condenser fan acceptable noise and vibration				
Condenser fan clean and in good condition				

Project name:	Date:

General checklist (continued)

Checklist item	Equipment identifier			
Condenser coils clean and in good condition				
Other (list):				

The following items need correction:

General comments:

Signature:_____ Company:_____ Date:_____

Commissioning agent

APPENDIX 2: COMMISSIONING RESOURCE DOCUMENTS

Building Commissioning Guidelines, Second Edition. Portland, Oregon: Bonneville Power Administration, 1992. Prepared by Portland Energy Conservation, Inc.

Catalogue on Procedural Standards for Building Systems Commissioning; NEBB Procedural Standards for Building Systems Commissioning, First Edition. Rockville, Maryland: National Environmental Balancing Bureau, January 1993.

Guideline for Commissioning of HVAC Systems. Atlanta: American Society of Heating, Refrigerating, & Air-Conditioning Engineers, Inc., 1989. ISSN, 1049-894X.

Model Commissioning Plan and Guide Specifications. Prepared by Portland Energy Conservation, Inc. for U.S. DOE Region 10, 1996.

Montgomery County Government – Contractor Quality Control and Commissioning Program – Guidelines and Specifications. Montgomery Engineering Institute, Department of Facilities and Services, Capital Projects Management Division, December 1993.

Panel 5: Commissioning, Operation and Maintenance. Volume 5 of the Proceedings of the ACEEE 1994 Summer Study on Energy Efficient Buildings. Washington, D.C.: American Council for an Energy Efficient Economy, 1994.

Proceedings of the First National Conference on Building Commissioning, in Sacramento, California, April 28-30, 1993, by Portland Energy Conservation, Inc. Portland, Oregon: Portland Energy Conservation, Inc., 1993.

Proceedings of the Second National Conference on Building Commissioning, in St. Petersburg Beach, Florida, May 9-11, 1994, by Portland Energy Conservation, Inc. Portland, Oregon: Portland Energy Conservation, Inc., 1994.

Proceedings of the Third National Conference on Building Commissioning, in Milwaukee, Wisconsin, May 1-3, 1995, by Portland Energy Conservation, Inc. Portland, Oregon: Portland Energy Conservation, Inc., 1995.

U.S. Department of Commerce. National Institute of Standards and Technology. *Commissioning Manual for Mechanical Systems in Federal Buildings.* Gaithersburg, Maryland: National Institute of Standards and Technology.

U.S. Department of Commerce. National Institute of Standards and Technology. *HVAC Functional Inspection and Testing Guide.* Prepared for the General Services Administration by James Y. Kao, March 1992. NISTIR 4758.

Washington State Department of Services Administration. Division of Engineering & Architectural Services. "Appendix XVI: Commissioning Guidelines" in *Guidelines for Architects and Engineers.* Olympia: Washington State Energy Office, 1993.

APPENDIX 3: OPERATION AND MAINTENANCE RESOURCES

Avedesdian, David A. *"How to Design & Manage Your Preventive Maintenance Program"* (booklet and software). Washington, D.C.: Building Owners and Managers Association, 1996. To order call 1-800-426-6292.

Bonneville Power Administration Guidelines for Applying Commissioning and O&M Requirements in the Energy Smart Design Program. Prepared by Portland Energy Conservation, Inc. for Bonneville Power Administration, 1993.

International Facilities Management Association, *"1994 Winter Best Practices Forum on Facility Management,"* Proceedings IFMA Best Practices Forum, (March 1994).

Portland Energy Conservation, Inc. *"Operation and Maintenance Practices in Commercial Buildings: Bibliography."* Prepared for U.S. EPA and U.S. DOE by Portland Energy Conservation, Inc., 1995. To order call 1-503-248-4636.

EXHIBIT I
Equipment Warranties

The procedure for additional replacement lamps and ballasts is for MDAD to contact FPLS (Rex Noble -561-681-3050) once the spare stock is near depletion. MDAD to advise type/ quantity required, along with delivery information. MDAD is to collect bad lamps and ballasts and turnover to FPLS, upon delivery of new stock.

FPLS Lighting Warranties

Part Description	Warranty
Linear Fluorescents T8 Lamps including; 2', 3', 4' and U-lamps	3 Years
Linear Fluorescents T5 Lamps including; 2' and 4'	3 Years
Induction Lamp 100W	5 Years
Compact fluorescents Plug-in Lamps of 13W	12 Months
Compact Fluorescents Screw-in lamps of 14W, 19W and 23W	12 Months
Metal Halide Lamps of 50, 70, 100 and 175W	12 Months
T8 Linear Fluorescent Electronic Ballasts for 1,2,3 and 4 Lamps	10 years
T5 Linear Fluorescent Electronic Ballasts for 2 Lamps	10 Years
Compact Fluorescent Plug-in Ballasts	5 years
Metal Halide Ballast for 50, 70, 100 and 175W	5 years
Induction Ballast for 100W	5 Years
New Lighting Fixtures including RT5	1 Year
All Other Related Construction Items	1 Year

The quantity of spare lamps, ballasts and fixtures to be provided at closeout are as follows:

- Standard fluorescent lamps - 6 boxes of T8 4' lamps, 3 boxes of T8 3' lamps, 2 boxes of T8 U-lamps, 1 box of T8 2' lamps, 1 box of 14W H T5 2' lamps, 5 boxes of 24WHO T5 2' and 1 box of 54WHO T5 4' lamps.
- Induction lamps – 10 100W Lamps.
- HID lamps – 25 70W lamps, 15 100W lamps and 10 150W lamps.
- Plug-In compact fluorescent lamps – 1 Box of 13W.
- Screw-In compact fluorescent lamps – 1 Box of 19W
- Electronic ballasts - 9 boxes of T8 ballasts for 1, 2, 3 and 4 lamp systems 3 of each (1, 2 & 3 LP - 1, 2, 3 & 4 NP – 1 & 2 HP), 4 boxes of T5 ballasts for 2 lamp systems (24WHO), 1 box of T5 ballasts for 2 lamp systems each of (54WHO & 14W), 5 ballast of compact fluorescent plug-in 2x13W and 5 ballast of 100W Induction.
- Fixtures - If there are any changes in quantities from the original scope of work as the construction progresses, the left over fixtures will be delivered to the MDAD personnel as spares.

EXHIBIT II

Unconditional Corporate Guarantee

Guaranty Agreement By [Guarantor]

This Guaranty Agreement (the "Guaranty"), dated effective as of _____, is made and entered into by _____, a _____ corporation ("Guarantor").

WHEREAS, _____ [guaranteed performance savings company] (the "Company"), and _____ (the "Agency"), have entered into or are contemplating entering into a Guaranteed Performance Savings Contract (referred to herein as the "Contract"); and Guarantor will directly or indirectly benefit from the transactions to be entered into between Company and Agency.

NOW THEREFORE, in consideration of Agency entering into the Contract, Guarantor hereby covenants and agrees as follows:

1. GUARANTY. Subject to the provisions hereof, (a) Guarantor hereby irrevocably and unconditionally guarantees the timely payment when due of the obligations of Company to pay for any shortfalls of guaranteed savings (the "Obligations") to Agency under the Contract, and (b) to the extent that Company shall fail to pay any Obligations, Guarantor shall promptly pay to Agency the amount due on Agency's demand therefore. This Guaranty shall constitute a guarantee of payment and not of collection. The liability of Guarantor under the Guaranty shall be subject to the following:

(a) Guarantor's liability hereunder shall be and is specifically limited to payments of the Obligations expressly required to be made under the Contract (even if such payments are deemed to be damages) and, except to the extent specifically provided in the Contract, in no event shall Guarantor be subject hereunder to consequential, exemplary, equitable, loss of profits, punitive, tort, or any other damages, costs, or attorney's fees; and

(b) The aggregate amount covered by this Guaranty shall not exceed the total equal to the amount of the Guarantee during the remaining term of the Guarantee Period as reflected in Schedule C, Savings Guarantee, incorporated in the Contract.

2. DEMANDS AND NOTICE. If Company fails or refuses to pay any Obligations, whether or not such obligations are the subject of a bona fide dispute pursuant to the underlying Contract, Agency shall notify Company in writing of the manner in which Company has failed to pay and demand that payment be made by Company. If Company's failure or refusal to pay continues for a period of fifteen (15) days after the date of Agency's notice to Company, and Agency has elected to exercise its rights under this Guaranty, Agency shall make a demand upon Guarantor (hereinafter referred to as a "Payment Demand"). A Payment Demand shall be in writing and shall

contain a copy of Agency's demand that payment be made by Company and a specific statement that Agency is calling upon Guarantor to pay under this Guaranty. A Payment Demand satisfying the foregoing requirements shall be required with respect to Obligations before Guarantor is required to pay such Obligations hereunder and shall be deemed sufficient notice to Guarantor that it must pay the Obligations. A single written Payment Demand shall be effective as to any specific default during the continuance of such default, until Company or Guarantor has cured such default, and additional written demands concerning such default shall not be required until such default is cured. The Guarantor shall not be required to make any inquiry, inspection or investigation in connection therewith.

3. REPRESENTATIONS AND WARRANTIES. Guarantor represents and warrants that:

(a) it is a corporation duly organized and validly existing under the laws of the State of Florida and has the corporate power and authority to execute, deliver and carry out the terms and provisions of the Guaranty;

(b) no authorization, approval, consent or order of, or registration or filing with, any court or other governmental body having jurisdiction over Guarantor is required on the part of Guarantor for the execution and delivery of this Guaranty; and

(c) this Guaranty, when executed and delivered, will constitute a valid and legally binding agreement of Guarantor, except as the enforceability of this Guaranty may be limited by the effect of any applicable bankruptcy, insolvency, reorganization, moratorium or similar laws affecting creditors' rights generally and by general principles of equity. Agency shall have the right to require Company to appoint a successor or alternative instrument supporting Company's Guarantee, acceptable to Agency, in the event of any one or more of the following circumstances, uncorrected for more than thirty (30) days: entry of an order for relief under Title 11 of the United States Code; the making by Guarantor of a general assignment for the benefit of creditors; the appointment of a general receiver or trustee in bankruptcy of Guarantor's business or property; or action by Guarantor under any state insolvency or similar law for the purpose of its bankruptcy, reorganization, or liquidation; unless within the specified thirty (30) day period, Guarantor (including its receiver or trustee in bankruptcy) provides to Agency adequate assurances, reasonably acceptable to Agency, of its continuing ability and willingness to fulfill its obligations under this Guaranty.

4. SETOFFS AND COUNTERCLAIMS. Without limiting Guarantor's own defenses and rights hereunder, Guarantor represents and warrants that its obligations to make payments pursuant to a Payment Demand shall not be subject to or limited by any rights, setoffs, counterclaims and other defenses to which Company or any other affiliate of Guarantor is or may be entitled to arising from or out of the Contract, except for defenses arising out of the bankruptcy, insolvency, dissolution or liquidation of Company, provided however, that Agency agrees that Guarantor shall be entitled to recover any payments made by Guarantor to Agency pursuant to a Payment Demand if,

as a result of a resolution of any bona fide dispute under the Contract concerning such payment or the Obligations, it is finally determined that Agency was not entitled to receive such payment or make such Payment Demand, and Agency agrees that it shall make promptly repay such amounts to Guarantor, pursuant to §215.422 Florida Statutes, after the date of Guarantor's notice to Agency that such repayment is due. An Agency shall not be liable for such payment to both the Guarantor and Company arising from the same dispute.

5. AMENDMENT OF GUARANTY. No term or provision of this Guaranty shall be amended, modified, altered, waived or supplemented except in a writing signed by Guarantor and Agency.

6. WAIVERS AND TERMINATION. Guarantor hereby waives (a) notice of acceptance of this Guaranty; (b) presentment and demand concerning the liabilities of Guarantor, except as expressly hereinabove set forth; and (c) any right to require that any action or proceeding be brought against Company or any other person, or except as expressly hereinabove set forth, to require that Agency seek enforcement of any performance against Company or any other person, prior to any action against Guarantor under the terms hereof.

Except as to applicable statutes of limitation, no delay of Agency in the exercise of, or failure to exercise, any rights hereunder shall operate as a waiver of such rights, a waiver of any other rights or a release of Guarantor from any obligations hereunder.

Guarantor consents to the renewal, compromise, extension, acceleration or other changes in the time of payment of or other changes in the terms of the Obligations, or any part thereof or any changes or modifications to the terms of the Contract.

This Guaranty shall terminate on _____ 12:00 midnight eastern standard time. Guarantor may terminate this Guaranty by providing written notice of such termination to Agency and upon the effectiveness of such termination, Guarantor shall have no further liability hereunder except as provided by the last sentence of this paragraph. No such termination shall be effective until the appointment of a successor or alternative instrument supporting Company's Guarantee, or until all Obligations of Company have been fulfilled. No such termination shall affect Guarantor's liability with respect to any Transaction (as defined in the Contract) entered into prior to the time the termination is effective, which Transaction shall remain guaranteed pursuant to the terms of this Guaranty.

7. NOTICE. Any Payment Demand, notice, request, instruction, correspondence or other document to be given hereunder by any party to another (herein collectively called "Notice") shall be in writing and delivered personally or mailed by certified mail, postage prepaid and return receipt requested, or by telegram or telecopier, as follows:

To Guarantor: To Agency:

Notice given by personal delivery or mail shall be effective upon actual receipt. Notice given by telegram or telecopier shall be effective upon actual receipt if received during the recipient's normal business hours, or at the beginning of the recipient's next business day after receipt if not received during the recipient's normal business hours. All Notices by telegram or telecopier shall be confirmed promptly after transmission in writing by certified mail or personal delivery. Any party may change any address to which Notice is to be given to it by giving notice as provided above of such change of address.

8. ASSIGNMENT. Neither Guarantor nor Agency shall assign this Guaranty without the express written consent of the other party.

9. MISCELLANEOUS. **THIS GUARANTY SHALL IN ALL RESPECTS BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAW OF THE STATE OF FLORIDA.** This Guaranty shall be binding upon Guarantor, its successors and assigns and inure to the benefit of and be enforceable by Agency, its successors and assigns. The Guaranty embodies the entire agreement and understanding between Guarantor and Agency and supersedes all prior agreements and understandings relating to the subject matter hereof. The headings in this Guaranty are for purposes of reference only, and shall not affect the meaning hereof.

IN WITNESS WHEREOF, the Guarantor has executed this Guaranty on _____, but it is effective as of the date first above written.

[GUARANTOR]

By:

_____

Name:
Title:

EXHIBIT III

FINAL ACCEPTANCE CERTIFICATE

(THIS CERTIFICATE IS TO BE EXECUTED ONLY WHEN ALL EQUIPMENT HAS BEEN ACCEPTED)

The undersigned herby certifies that the equipment described above, together with the equipment described in and accepted by Payment Request and Accptance Certificates previously filed by Lessee with the Escrow Agent and Lessor pursuant to the Escrow Agreeement, constitutes all of the Equipment subject to this lease.

Dated_____

_____
Lessee

_____

By_____

Title_____

Appendix C

MASTER EQUIPMENT LEASE/PURCHASE AGREEMENT (FLORIDA VERSION)

This Master Equipment Lease/Purchase Agreement (this "Agreement") dated as of _____, and entered into between Banc of America Public Capital Corp, a Kansas corporation ("Lessor"), and _____, a [body corporate and politic/municipality] existing under the laws of the State of Florida ("Lessee").

WITNESSETH:

Whereas, Lessee desires to lease and acquire from Lessor certain equipment described in each Schedule (as each such term is defined herein), subject to the terms and conditions of and for the purposes set forth in each Lease; and in the event of a conflict the terms of a Schedule prevail; and

Whereas, the relationship between the parties shall be a continuing one and items of equipment may be added to the Equipment from time to time by execution of additional Schedules by the parties hereto and as otherwise provided herein; and

Whereas, Lessee is authorized under the constitution and laws of the State to enter into this Agreement and the Schedules hereto for the purposes set forth herein;

Now, Therefore, for good and valuable consideration, receipt of which is hereby acknowledged, and in consideration of the premises hereinafter contained, the parties hereby agree as follows:

ARTICLE I

Section 1.01. Definitions. The following terms will have the meanings indicated below unless the context clearly requires otherwise:

"*Acquisition Amount*" means the amount specified in each Lease and represented by Lessee to be sufficient to acquire the Equipment listed in such Lease, which amount shall be not less than $100,000 per Lease for Leases where the Acquisition Amount is to be paid directly to the Vendor.

"*Acquisition Fund*" means, with respect to any Lease, the fund established and held by the Acquisition Fund Custodian pursuant to the related Acquisition Fund Agreement, if any.

"*Acquisition Fund* Agreement" means, with respect to any Lease, an Acquisition Fund Agreement in form and substance acceptable to and executed by Lessee, Lessor and the Acquisition Fund Custodian, pursuant to which an Acquisition Fund is established and administered.

"*Acquisition Fund Custodian*" means the Acquisition Fund Custodian identified in any Acquisition Fund Agreement, and its successors and assigns.

"Acquisition Period" means, with respect to each Lease, that period stated in the Schedule to such Lease during which the Lease Proceeds attributable to such Lease may be expended on Equipment Costs.

"Act" means, collectively, _____, the Constitution of the State, and other applicable provisions of law.

"*Agreement*" means this Master Equipment Lease/Purchase Agreement, including the exhibits hereto, together with any amendments and modifications to the Agreement pursuant to Section 13.06.

"*Code*" means the Internal Revenue Code of 1986, as amended. Each reference to a Section of the Code herein shall be deemed to include the United States Treasury Regulations proposed or in effect thereunder.

"*Commencement Date*" means, for each Lease, the date when Lessee's obligation to pay Rental Payments commences under such Lease, which date shall be the earlier of (i) the date on which the Equipment listed in such Lease is accepted by Lessee in the manner described in Section 5.01, or (ii) the date on which sufficient moneys to purchase the Equipment listed in such Lease are deposited for that purpose with an Acquisition Fund Custodian.

"*Equipment*" means the property listed in each of the Leases and all replacements, repairs, restorations, modifications and improvements thereof or thereto made pursuant to Section 8.01 or Article V. Whenever reference is made in this Agreement to Equipment listed in a Lease, such reference shall be deemed to include all such replacements, repairs, restorations, modifications and improvements of or to such Equipment.

"*Equipment Costs*" means, to the extent permitted by the Act, the total cost of the Equipment listed in each Lease, including all delivery charges, installation charges, capitalizable consulting and training fees approved by Lessor, legal fees, financing costs, motor vehicle registration fees, recording and filing fees, and other costs necessary to vest full, clear legal title to the Equipment in Lessee, subject to the security interest granted to and retained by Lessor as set forth in each Lease, and otherwise incurred in connection with the financing provided by the lease-purchase of the Equipment as provided in each Lease; provided that in no event shall approved consulting and training fees or other non-capitalizable "soft" costs relating to the Equipment listed in any Lease which are to be financed by Lessor hereunder exceed 2% of the total cost of such Equipment as determined by Lessor; and provided further, that in no event shall capitalizable delivery charges, installation charges, taxes and similar capitalizable "soft costs" relating to such Equipment be included without Lessor's prior consent.

"*Expense Fund*" means, with respect to any Lease, the fund established and held by the Acquisition Fund Custodian pursuant to the related Acquisition Fund Agreement.

"*Event of Default*" means an Event of Default described in Section 12.01.

"*Lease*" means a Schedule and the terms of this Agreement which are incorporated by reference into such Schedule. Each Schedule with the incorporated terms of this Agreement shall constitute a separate and independent Lease.

"*Lease Proceeds*" means, with respect to each Lease, the total amount of money to be paid by Lessor to the Acquisition Fund Custodian for deposit and application in accordance with such Lease and the Acquisition Fund Agreement.

"*Lease Term*" for each Lease means the Original Term and all Renewal Terms therein provided and for this Agreement means the period from the date hereof until this Agreement is terminated.

"*Lessee*" means the entity referred to as Lessee in the first paragraph of this Agreement.

"*Lessor*" means (a) the entity referred to as Lessor in the first paragraph of this Agreement or (b) any assignee or transferee of any right, title or interest of Lessor in and to the Equipment under a Lease or any Lease (including Rental Payments thereunder) pursuant to Section 11.01, but does not include any entity solely by reason of that entity retaining or assuming any obligation of Lessor to perform under a Lease.

"*Original Term*" means the period from the Commencement Date for each Lease until the end of the fiscal year of Lessee in effect at such Commencement Date.

"*Purchase Price*" means, with respect to the Equipment listed on a Lease, the amount that Lessee may pay to Lessor to purchase such Equipment as provided in such Lease.

"*Renewal Terms*" means the renewal terms of each Lease, each having a duration of one year and a term coextensive with Lessee's fiscal year, as specified in the Schedule applicable thereto.

"*Rental Payments*" means the basic rental payments payable by Lessee under each Lease pursuant to Section 4.01, in each case consisting of a principal component and an interest component.

"*Schedule*" means each separately numbered Schedule of Property substantially in the form of Exhibit A hereto together with a Rental Payment Schedule attached thereto substantially in the form of Exhibit A-1 hereto.

"*State*" means the State of Florida.

"*Utilization Period*" means the date, with respect to each Lease not funded under an Acquisition Fund Agreement, by which Lessee must deliver an Acceptance Certificate for the Equipment under such Lease as indicated in Section 5.01(a).

"*Vendor*" means the manufacturer or supplier of the Equipment or any other person as well as the agents or dealers of the manufacturer or supplier from whom Lessor arranged Lessee's acquisition and financing of the Equipment pursuant to the applicable Lease.

ARTICLE II

Section 2.01. Representations and Covenants of Lessee. This Section 2.01 sets forth facts and estimates upon which Lessor and its counsel may rely regarding the exclusion of the interest portion of the Rental Payments from the gross income of Lessor, and the facts and estimates upon which Lessee bases its reasonable expectation that the obligation to make Rental Payments pursuant to the Leases does not create an arbitrage bond under Section 148 of the Internal Revenue Code of 1986, as amended, and applicable Treasury Regulations.

Lessee represents, covenants and warrants for the benefit of Lessor on the date hereof and as of the Commencement Date of each Lease as follows:

(a) Lessee is a state or a political subdivision thereof within the meaning of Section 103(c) of the Code, duly organized and existing under the constitution and laws of the State, including the Act, with full power and authority to enter into this Agreement and each Lease and the transactions contemplated hereby and to perform all of its obligations hereunder and under each Lease.

(b) Lessee has duly authorized the execution and delivery of this Agreement and each Lease by proper action of its governing body at a meeting duly called, regularly convened and attended throughout by the requisite quorum of the members thereof, or by other appropriate official approval, and all requirements have been met and procedures have occurred in order to ensure the validity and enforceability of this Agreement and each Lease.

(c) No event or condition that constitutes, or with the giving of notice or the lapse of time or both would constitute, an Event of Default exists at the date hereof. Lessee is not in default under any indenture, mortgage, deed of trust, bank loan, credit agreement or other instrument to which Lessee is a party.

(d) The entering into and performance of each Lease by Lessee will not violate any judgment, order, or regulation applicable to Lessee, and except as otherwise expressly provided in this Agreement, result in the creation of any lien, charge, security interest, or other encumbrance upon any assets of Lessee pursuant to any indenture, mortgage, deed of trust, bank loans, credit agreement or other instrument to which Lessee is a party or by which it or its assets may be bound.

(e) There are no actions, suits or proceedings pending or, to the knowledge of Lessee, threatened against or affecting Lessee in any court or before any governmental commission, board or authority, which, if adversely determined, will have a material adverse effect on the ability on Lessee to perform its obligations under this Agreement or any Lease.

(f) Lessee has complied and will comply with Sections 218.38, 218.385(2) and 218.385(3), Florida Statutes, with respect to each Lease.

(g) The interest rate for the interest portion of the Rental Payments, on the first date interest begins to accrue, does not exceed a rate of interest permitted by Section 215.84, Florida Statutes.

(h) Lessee will do or cause to be done all things necessary to preserve and keep in full force and effect its existence as a body corporate and politic.

(i) Lessee has complied and will comply with such open meeting laws and public bidding requirements as may be applicable to this Agreement and each Lease and the acquisition by Lessee of the Equipment as provided in each Lease or, in the case of public bidding requirements, has otherwise complied and will comply with Section 218.385(1), Florida Statutes, in connection with each Lease.

(j) During the Lease Term, the Equipment will be used by Lessee only for the purpose of performing essential governmental or proprietary functions of Lessee permitted under the Act. Lessee does not intend to sell or otherwise dispose of the Equipment or any interest therein prior to the last Rental Payment (including all Renewal Terms) scheduled to be paid under each Lease.

(k) Lessee has kept, and throughout the Lease Term will keep, its books and records in accordance with generally accepted accounting principles and practices consistently applied, and shall deliver to Lessor (i) annual audited financial statements (including a balance sheet, statement of revenues, expenses and changes in fund balances for budget and actual, statement of cash flows and notes, and schedules and attachments to the financial statements) within 180 days of its fiscal year end, (ii) quarterly financial statements (including a balance sheet, statement of revenues, expenses and changes in fund balances for budget and actual and statement of cash flows and notes) upon the request of Lessor, within 60 days of the end of the fiscal quarter for which such information has been requested, (iii) such other financial statements and information as Lessor may reasonably request, and (iv) its annual budget for the following fiscal year within 90 days of the adoption of such budget. Such statements in clause (i) above shall be accompanied by an unqualified opinion of Lessee's auditor. Credit information relating to Lessee may be disseminated among Lessor and any of its affiliates and any of their respective successors and assigns.

(l) The proceeds of the Lease, together with investment earnings thereon, will be expended to acquire Equipment within 6 months from the first day of the Original Term.

(m) Lessee has an immediate need for the Equipment listed on each Schedule and expects to make immediate use of the Equipment listed on each Schedule. Lessee's need for the Equipment is not temporary and Lessee does not expect the need for any item of the Equipment to diminish during the Lease Term of such item. The use of the Equipment is essential to Lessee's proper efficient and economic operation.

(n) The original proceeds of each Lease, and the interest to be earned thereon, do not and will not exceed the amount necessary for the purpose for which such Lease is executed.

(o) No sinking fund is expected to be created by Lessee with respect to any Lease or the Rental Payments.

(p) No other governmental obligations of Lessee are being issued at substantially the same time and sold pursuant to a common plan of financing which will be paid out of (or have

substantially the same claim to be paid out of) substantially the same source of funds as each Lease.

(q) No portion of the amounts received pursuant to each Lease will be used as a substitute for other funds which were otherwise to be used as a source of financing for any portion of the costs of Equipment and which have been and will be used to acquire, directly or indirectly, obligations producing a yield in excess of the yield on each Lease.

(r) In connection with the execution and delivery of each Lease, no action has or will be taken which attempts to circumvent the provisions of Section 148 of the Code and the regulations promulgated thereunder by (i) enabling Lessee to exploit the difference between tax-exempt and taxable interest rates to gain a material financial advantage and (ii) over burdening the tax-exempt bond market.

(s) Lessee will not directly or indirectly use or permit the use of any proceeds of a Lease, or take or omit to take any action, that would cause the Rental Payments to be "federally guaranteed" within the meaning of Section 149(b) of the Code.

(t) Lessee will submit to the Secretary of the Treasury information reporting statements and other information related to each Lease at the times and in the forms required by the Code.

(u) To the best of the knowledge and belief of Lessee, the expectations of Lessee, as set forth in this Section 2.01, are reasonable, and there are no present facts, estimates and circumstances which would change the expectations contained therein.

(v) There is no pending litigation, tax claim, proceeding or dispute that may adversely affect Lessee's financial condition or impairs its ability to perform its obligations hereunder. Lessee will, at its expense, maintain its legal existence in good standing and do any further act and execute, acknowledge, deliver, file, register and record any further documents Lessor may reasonably request in order to protect Lessor's security interest in the Equipment and Lessor's rights and benefits under this Lease.

(w) The payment of the Rental Payments or any portion thereof is not (under the terms of any Lease or any underlying arrangement) directly or indirectly (1) secured by any interest in property used or to be used in any activity carried on by any person other than a state or local governmental unit or payments in respect of such property; or (2) on a present value basis, derived from payments (whether or not to Lessee) in respect of property, or borrowed money, used or to be used in any activity carried on by any person other than a state or local governmental unit. The Equipment will not be used, directly or indirectly, in any activity carried on by any person other than a state or local governmental unit. No portion of the Equipment Costs for the Equipment will be used, directly or indirectly, to make or finance loans to any person other than Lessee. Lessee has not entered into any management or other service contract with respect to the use and operation of the Equipment.

(x) Lessee has reviewed and will review Internal Revenue Service Form 8038-G to be filed in connection with the execution and delivery of each Lease, and all of the information contained therein is, and will be, to the best of Lessee's knowledge, true and correct, and Lessee

will cause such Form 8038-G to be filed not later than 30 days after the execution and delivery of each Lease.

(y) Lessee reasonably expects that at least 85% of the proceeds of each Lease will be expended for the governmental purpose of the Lease within 3 years of the initial date of the Lease term, and less than 50% of the proceeds of each Lease will be invested in investment securities with a substantially guaranteed yield for 4 years or longer.

ARTICLE III

Section 3.01. Lease of Equipment. Subject to the terms of this Master Lease, Lessor agrees to provide the funds specified as the "Acquisition Amount" in each Lease to acquire the Equipment. Upon the execution of each Lease, Lessor demises, leases, transfers and lets to Lessee, and Lessee acquires, rents and leases from Lessor, the Equipment as set forth in such Lease and in accordance with the terms thereof.

Section 3.02. Continuation of the Lease Term. The Lease Term for each Lease may be continued, solely at the option of Lessee, at the end of the Original Term or any Renewal Term for the next succeeding Renewal Term up to the maximum Lease Term set forth in such Lease. At the end of the Original Term and at the end of each Renewal Term until the maximum Lease Term has been completed, Lessee shall be deemed to have exercised its option to continue each Lease for the next Renewal Term unless Lessee terminates such Lease pursuant to Section 3.03 or Section 10.01. The terms and conditions during any Renewal Term shall be the same as the terms and conditions during the Original Term, except that the Rental Payments shall be as provided in the applicable Lease.

Lessee intends, subject to Section 3.03, to continue the Lease Term of each Lease through the Original Term and all Renewal Terms and to pay the Rental Payments thereunder. Lessee affirms that sufficient funds are available for the current fiscal year, and Lessee reasonably believes that an amount sufficient to make all Rental Payments during the entire Lease Term of each Lease can be obtained from legally available funds of Lessee. Subject to Section 3.03, Lessee further intends to do all things lawfully within its power to obtain and maintain funds sufficient and available to discharge its obligation to make Rental Payments due hereunder, including making provision for such payments to the extent necessary in each budget or appropriation request submitted and adopted in accordance with applicable provisions of law, to have such portion of the budget or appropriation request approved and to exhaust all available reviews and appeals in the event such portion of the budget or appropriation request is not approved.

Section 3.03. Nonappropriation. Lessee is obligated only to pay such Rental Payments under each Lease as may lawfully be made from funds budgeted and appropriated for that purpose during Lessee's then current fiscal year. Should Lessee fail to budget, appropriate or otherwise make available funds to pay Rental Payments under any Lease following the then current Original Term or Renewal Term, such Lease or Leases shall be deemed terminated at the end of the then current Original Term or Renewal Term. Lessee agrees to deliver notice to Lessor of such termination at least 90 days prior to the end of the then current Original Term or

Renewal Term, but failure to give such notice shall not extend the term beyond such Original Term or Renewal Term. If any Lease is terminated in accordance with this Section, Lessee agrees to peaceably deliver the Equipment to Lessor at the location(s) to be specified by Lessor.

Section 3.04. Substitution. Lessee reserves the right to substitute Equipment of the same quantity and general type with the approximate equal value, utility and remaining useful life as the Equipment so replaced. Such substitution is subject to Lessor's prior written consent, which consent shall not be unreasonably withheld, and shall be reflected in an amendment to the appropriate Schedule.

Section 3.05. Conditions to Lessor's Performance Under Any Lease.

(a) As a prerequisite to the performance by Lessor of any of its obligations pursuant to any Lease, Lessee shall deliver to Lessor the following:

(i) A fully completed Schedule, executed by Lessee;

(ii) An Acquisition Fund Agreement, executed by Lessee and the Acquisition Fund Custodian, unless Lessor pays 100% of the Acquisition Amount directly to the Vendor upon execution of the Lease;

(iii) A Certificate executed by the Clerk or Secretary or other comparable officer of Lessee, in substantially the form attached hereto as Exhibit C, completed to the satisfaction of Lessor;

(iv) A certified copy of a resolution or other official action of Lessee's governing body authorizing the execution and delivery of the Lease and performance by Lessee of its obligations thereunder;

(v) An opinion of counsel to Lessee in substantially the form attached hereto as Exhibit D respecting such Lease and otherwise satisfactory to Lessor;

(vi) An executed Essential Use/Source of Funds Certificate in substantially the form attached hereto as Exhibit E;

(vii) Evidence of insurance as required by Section 7.02 hereof;

(viii) All documents, including financing statements, affidavits, notices and similar instruments, in form satisfactory to Lessor;

(ix) A copy of a fully completed and executed Form 8038-G; and

(x) Such other items, if any, as are set forth in such Lease or are reasonably required by Lessor.

(b) In addition, the performance by Lessor of any of its obligations pursuant to any Lease shall be subject to: (i) no material adverse change in the financial condition of Lessee since the date of this Agreement, (ii) no Event of Default having occurred, and (iii) if no

Acquisition Fund has been established, the Equipment must be accepted by Lessee no later than _____ (the "Utilization Period").

(c) Subject to satisfaction of the foregoing, Lessor will pay the Acquisition Amount for Equipment described in a Schedule to the Vendor upon receipt of the documents described in Section 5.01; or if an Acquisition Fund has been established pursuant to an Acquisition Fund Agreement, Lessor will deposit the Acquisition Amount for Equipment described in the Schedule with the Acquisition Fund Custodian.

(d) This Agreement is not a commitment by Lessor to enter into any Lease not currently in existence, and nothing in this Agreement shall be construed to impose any obligation upon Lessor to enter into any proposed Lease, it being understood that whether Lessor enters into any proposed Lease shall be a decision solely within Lessor's discretion.

(e) Lessee will cooperate with Lessor in Lessor's review of any proposed Lease. Without limiting the foregoing, Lessee will provide Lessor with any documentation or information Lessor may request in connection with Lessor's review of any proposed Lease. Such documentation may include, without limitation, documentation concerning the Equipment and its contemplated use and location and documentation or information concerning the financial status of Lessee and other matters related to Lessee.

ARTICLE IV

Section 4.01. Rental Payments. Subject to Section 3.03, Lessee shall promptly pay Rental Payments, in lawful money of the United States of America, to Lessor on the dates and in such amounts as provided in each Lease. Lessee shall pay Lessor a charge on any Rental Payment not paid on the date such payment is due at the rate of 16% per annum or the maximum amount permitted by law, whichever is less, from such date. Rental Payments consist of principal and interest payments as more fully detailed on each Schedule, the interest on which begins to accrue as of the Commencement Date for each such Schedule.

Section 4.02. Interest and Principal Components. A portion of each Rental Payment is paid as, and represents payment of, interest, and the Balance of each Rental Payment is paid as, and represents payment of, principal. Each Lease shall set forth the principal and interest components of each Rental Payment payable thereunder during the Lease Term.

Section 4.03. Rental Payments to Constitute a Current Expense of Lessee. Lessor and Lessee understand and intend that the obligation of Lessee to pay Rental Payments under each Lease shall constitute a current expense of Lessee payable solely from its general fund or other funds that are legally available for that purpose and shall not in any way be construed to be a debt of Lessee in contravention of any applicable constitutional or statutory limitation or requirement concerning the creation of indebtedness by Lessee. THE RENTAL PAYMENTS ARE TO BE MADE ONLY FROM LESSEE'S LEGALLY AVAILABLE REVENUES APPROPRIATED ON AN ANNUAL BASIS, AND NEITHER LESSEE, THE STATE, NOR ANY POLITICAL SUBDIVISION OR AGENCY THEREOF SHALL BE OBLIGATED TO PAY ANY SUMS DUE UNDER A LEASE FROM THE COMPELLED LEVY OF AD VALOREM OR OTHER TAXES EXCEPT FROM THOSE LEGALLY AVAILABLE

REVENUES APPROPRIATED BY LESSEE ON AN ANNUAL BASIS, AND NEITHER THE FULL FAITH AND CREDIT NOR THE TAXING POWER OF LESSEE, THE STATE OF FLORIDA OR ANY POLITICAL SUBDIVISION THEREOF ARE PLEDGED FOR PAYMENT OF SUCH SUMS DUE UNDER A LEASE.

Section 4.04. Rental Payments to be Unconditional. Except as provided in Section 3.03, the obligations of Lessee to make Rental Payments and to perform and observe the other covenants and agreements contained in each Lease shall be absolute and unconditional in all events without abatement, diminution, deduction, set-off or defense, for any reason, including without limitation any failure of the Equipment, after it has been accepted by lessee, any defects, malfunctions, breakdowns or infirmities in the equipment or any accident, condemnation or unforeseen circumstances.

Section 4.05. Tax Covenant. Lessee agrees that it will not take, or fail to take in a timely manner, any action that would cause the interest component of Rental Payments to be or to become ineligible for the exclusion from gross income of the owner or owners thereof for federal income tax purposes, including, without limitation, the calculation and payment of any rebate required to preserve such exclusion. Subject to Lessee's right to terminate the Lease as provided herein, the foregoing covenant shall remain in effect until the date on which all obligations of Lessee in fulfilling the above covenant under the Code have been met.

Section 4.06. Event of Taxability. Upon the occurrence of an Event of Taxability, the interest component shall be at a Taxable Rate retroactive to the date as of which the interest component is determined by the Internal Revenue Service to be includible in the gross income of the owner or owners thereof for federal income tax purposes, and Lessee will pay such additional amount as will result in the owner receiving the interest component at the Taxable Rate identified in the related Lease.

For purposes of this Section, "Event of Taxability" means a determination that the interest component is includible for federal income tax purposes in the gross income of the owner thereof due to Lessee's action or failure to take any action.

Section 4.07. Mandatory Prepayment. If the Lease Proceeds are deposited into an Acquisition Fund, any funds remaining in the Acquisition Fund on or after the Acquisition Period and not applied to Equipment Costs, shall be applied by Lessor on the next Rental Payment date, pro rata to the prepayment of the principal component of the outstanding Rental Payments due under the applicable Schedule.

ARTICLE V

Section 5.01. Delivery, Installation and Acceptance of Equipment.

(a) Lessee shall order the Equipment, cause the Equipment to be delivered and installed at the location specified in the Leases, and pay any and all delivery and installation costs and other Equipment Costs in connection therewith. When the Equipment listed in any Lease has been delivered and installed, Lessee shall promptly accept such Equipment and

evidence said acceptance by executing and delivering to Lessor an acceptance certificate in the form attached hereto as Exhibit B.

(b) Lessee shall deliver to Lessor original invoices and bills of sale (if title to such Equipment has passed to Lessee) relating to each item of Equipment accepted by Lessee. With respect to Equipment not purchased through an Acquisition Fund, Lessor shall, upon receipt of an Acceptance Certificate from Lessee, prepare a Schedule of Property and Rental Payment Schedule. Lessee shall execute and deliver such Schedules to Lessor within 5 business days of receipt.

Section 5.02. Enjoyment of Equipment. Lessor shall provide Lessee with quiet use and enjoyment of the Equipment during the Lease Term, and Lessee shall peaceably and quietly have, hold and enjoy the Equipment during the Lease Term, without suit, trouble or hindrance from Lessor, except as otherwise expressly set forth in the related Lease. Lessor shall not interfere with such quiet use and enjoyment during the Lease Term so long as Lessee is not in default under the related Lease.

Section 5.03. Location and Inspection of the Equipment. Once installed, Lessee will not move any item of the Equipment from the location specified for it in the Lease on which such item is listed without Lessor's consent, which consent shall not be unreasonably withheld. Lessor shall have the right at all reasonable times during regular business hours to enter into and upon the property of Lessee for the purpose of inspecting the Equipment. Lessee shall promptly provide any information about the Equipment or a Lease that may be reasonably requested by Lessor.

Section 5.04. Use and Maintenance of the Equipment. Lessee will not install, use, operate, or maintain the Equipment improperly, carelessly, in violation of any applicable law or in a manner contrary to that contemplated by the related Lease. Lessee shall provide all permits and licenses, if any, necessary for the installation and operation of the Equipment. In addition, Lessee agrees to comply in all respects with all applicable laws, regulations and rulings of any legislative, executive, administrative, or judicial body; provided that Lessee may contest in good faith the validity or application of any such law, regulation or ruling in any reasonable manner that does not, in the opinion of Lessor, adversely affect the interest (including the reversionary interest) of Lessor in and to the Equipment or its interest or rights under the Lease.

Lessee agrees that it will maintain, preserve, and keep the Equipment in good repair and working order, in accordance with manufacturer's recommendations. Lessor shall have no responsibility to maintain, repair or make improvements or additions to the Equipment. If commercially available, Lessee will maintain in force a standard maintenance contract with the manufacturer of the Equipment, and upon request will provide Lessor with a copy of that contract. Upon the prior written consent of Lessor, which consent shall not be unreasonably withheld, Lessee may use another third party maintenance provider provided the maintenance contract between Lessee and such third party requires the third party to maintain the Equipment at the manufacturer's then current release, revision and engineering change levels, including hardware, software enhancements and microcode levels. In all cases, Lessee agrees to pay any costs necessary for the manufacturer to re-certify the Equipment as eligible for manufacturer's maintenance upon the return of the Equipment to Lessor as provided for herein.

Lessee shall not alter any item of Equipment or install any accessory, equipment or device on an item of Equipment if that would impair any applicable warranty, the originally intended function or the value of that Equipment. All repairs, parts, accessories, equipment and devices furnished, affixed to or installed on any Equipment, excluding temporary replacements, shall thereupon become subject to the security interest of Lessor.

ARTICLE VI

Section 6.01. Title to the Equipment. During each Lease Term, and so long as Lessee is not in default under Article XII hereof, all right, title and interest in and to each item of the Equipment shall be vested in Lessee immediately upon its acceptance of each item of Equipment, subject to the terms and conditions of the applicable Lease. Lessee shall at all times protect and defend, at its own cost and expense, its title in and to the Equipment from and against all claims, liens and legal processes of its creditors, and keep all Equipment free and clear of all such claims, liens and processes. Upon the occurrence of an Event of Default or upon termination of a Lease pursuant to Section 3.03 hereof, full and unencumbered legal title to the Equipment shall pass to Lessor, and Lessee shall have no further interest therein except as provided in Section 12.02(c). In addition, upon the occurrence of such an Event of Default or such termination, Lessee shall execute and deliver to Lessor such documents as Lessor may request to evidence the passage of such legal title to Lessor and the termination of Lessee's interest therein, and upon request by Lessor shall deliver possession of the Equipment to Lessor in accordance with Section 12.02. Upon purchase of the Equipment under a Lease by Lessee pursuant to Section 10.01, Lessor's interest in the Equipment shall terminate, and Lessor shall execute and deliver to Lessee such documents as Lessee may request to evidence the termination of Lessor's interest in Equipment subject to the related Lease.

Section 6.02. Personal Property. The Equipment is and will remain personal property and will not be deemed to be affixed to or a part of the real estate on which it may be situated, notwithstanding that the Equipment or any part thereof may be or hereafter become in any manner physically affixed or attached to real estate or any building thereon. Upon the request of Lessor, Lessee will, at Lessee's expense, furnish a waiver of any interest in the Equipment from any party having an interest in any such real estate or building.

ARTICLE VII

Section 7.01. Liens, Taxes, Other Governmental Charges and Utility Charges. Lessee shall keep the Equipment free of all levies, liens, and encumbrances except those created by each Lease. The parties to this Agreement contemplate that the Equipment will be used for a governmental, municipal or public purpose or function of Lessee and that the Equipment will therefore be exempt from all property taxes. If the use, possession or acquisition of any Equipment is nevertheless determined to be subject to taxation, Lessee shall pay when due all taxes and governmental charges lawfully assessed or levied against or with respect to such Equipment. Lessee shall pay all utility and other charges incurred in the use and maintenance of the Equipment. Lessee shall pay such taxes or charges as the same may become due; provided that, with respect to any such taxes or charges that may lawfully be paid in installments over a

period of years, Lessee shall be obligated to pay only such installments as accrue during each Lease Term. In the event that the installation of any component of any item of Equipment could be deemed to require a performance and payment bond under Section 255.05, Florida Statutes, or be deemed subject to the mechanic's lien provisions of Chapter 713, Florida Statutes, or any successor statute to each, as they may be amended from time to time, Lessee shall require such bonds, post such notices and do all other things provided for under such laws in order to keep the Equipment free of and exempt from all liens.

Section 7.02. Insurance. Lessee shall during each Lease Term maintain or cause to be maintained (a) casualty insurance naming Lessor and its assigns as additional insured and loss payee and insuring the Equipment against loss or damage by fire and all other risks covered by the standard extended coverage endorsement then in use in the State, and any other risks reasonably required by Lessor, in an amount at least equal to the then applicable Purchase Price of the Equipment; (b) liability insurance that protects Lessor from liability in all events in form and amount satisfactory to Lessor; and (c) worker's compensation coverage as required by the laws of the State; provided that, with Lessor's prior written consent, Lessee may self-insure against the risks described in clause (a). Lessee shall furnish to Lessor evidence of such insurance or self-insurance coverage throughout each Lease Term. Lessee shall not cancel or modify such insurance or self-insurance coverage in any way that would affect the interests of Lessor without first giving written notice thereof to Lessor at least 30 days in advance of such cancellation or modification. All insurance policies required by this Section 7.02 shall be taken out and maintained with responsible insurance companies qualified to do business in the State and shall contain a provision that the insurer shall not cancel or revise coverage thereunder without giving written notice to the insured parties at least 30 days before the cancellation or revision becomes effective.

Section 7.03. Advances. In the event Lessee shall fail to keep the Equipment in good repair and working order, Lessor may, but shall be under no obligation to, maintain and repair the Equipment and pay the cost thereof. All amounts so advanced by Lessor shall constitute additional rent for the then current Original Term or Renewal Term and Lessee covenants and agrees to pay such amounts so advanced by Lessor with interest thereon from the due date until paid at the rate of 16% per annum or the maximum amount permitted by law, whichever is less.

ARTICLE VIII

Section 8.01. Damage, Destruction and Condemnation. Unless Lessee shall have exercised its option to purchase the Equipment by making payment of the Purchase Price as provided in the related Lease, if, prior to the termination of the applicable Lease Term, (a) the Equipment or any portion thereof is destroyed, in whole or in part, or is damaged by fire or other casualty or (b) title to, or the temporary use of, the Equipment or any part thereof shall be taken under the exercise or threat of the power of eminent domain by any governmental body or by any person, firm or corporation acting pursuant to governmental authority, Lessee and Lessor will cause the Net Proceeds of any insurance claim or condemnation award or sale under threat of condemnation to be applied to the prompt replacement, repair, restoration, modification or improvement of the Equipment. Any balance of the Net Proceeds remaining after such work has been completed shall be paid to Lessee.

If Lessee elects to replace any item of the Equipment (the "Replaced Equipment") pursuant to this Section, the replacement equipment (the "Replacement Equipment") shall be of similar type, utility and condition to the Replaced Equipment and shall be of equal or greater value than the Replaced Equipment. Lessee shall represent, warrant and covenant to Lessor that each item of Replacement Equipment is free and clear of all claims, liens, security interests and encumbrances, excepting only those liens created by or through Lessor, and shall provide to Lessor any and all documents as Lessor may reasonably request in connection with the replacement, including, but not limited to, documentation in form and substance satisfactory to Lessor evidencing Lessor's security interest in the Replacement Equipment. Lessor and Lessee hereby acknowledge and agree that any Replacement Equipment acquired pursuant to this paragraph shall constitute "Equipment" for purposes of this Master Equipment Lease and the related Lease. Lessee shall complete the documentation of Replacement Equipment on or before the next Rent Payment date after the occurrence of a casualty event, or be required to exercise the Purchase Option with respect to the damaged equipment.

For purposes of this Article, the term "Net Proceeds" shall mean the amount remaining from the gross proceeds of any insurance claim or condemnation award or sale under threat of condemnation after deducting all expenses, including attorneys' fees, incurred in the collection thereof.

Section 8.02. Insufficiency of Net Proceeds. If the Net Proceeds are insufficient to pay in full the cost of any repair, restoration, modification or improvement referred to in Section 8.01, Lessee shall either (a) complete such replacement, repair, restoration, modification or improvement and pay any costs thereof in excess of the amount of the Net Proceeds, or (b) pay or cause to be paid to Lessor the amount of the then applicable Purchase Price for the Equipment, and, upon such payment, the applicable Lease Term shall terminate and Lessor's security interest in the Equipment shall terminate as provided in Article VI hereof. The amount of the Net Proceeds, if any, remaining after completing such repair, restoration, modification or improvement or after purchasing such Equipment and such other Equipment shall be retained by Lessee. If Lessee shall make any payments pursuant to this Section, Lessee shall not be entitled to any reimbursement therefor from Lessor nor shall Lessee be entitled to any diminution of the amounts payable under Article IV.

ARTICLE IX

Section 9.01. Disclaimer of Warranties. Lessor makes no warranty or representation, either express or implied, as to the value, design, condition, merchantability or fitness for particular purpose or fitness for use of the Equipment, or any other warranty or representation, express or implied, with respect thereto and, as to Lessor, Lessee's acquisition of the Equipment shall be on an "as is" Basis. In no event shall Lessor be liable for any incidental, indirect, special or consequential damage in connection with or arising out of this Agreement, any Lease, the Equipment or the existence, furnishing, functioning or Lessee's use of any item, product or service provided for in this Agreement or any Lease.

Section 9.02. Vendor's Warranties. Lessor hereby irrevocably appoints Lessee its agent and attorney-in-fact during each Lease Term, so long as Lessee shall not be in default under the

related Lease, to assert from time to time whatever claims and rights (including without limitation warranties) relating to the Equipment that Lessor may have against Vendor. Lessee's sole remedy for the breach of such warranty, indemnification or representation shall be against Vendor of the Equipment, and not against Lessor. Any such matter shall not have any effect whatsoever on the rights and obligations of Lessor with respect to any Lease, including the right to receive full and timely payments under a Lease. Lessee expressly acknowledges that Lessor makes, and has made, no representations or warranties whatsoever as to the existence or the availability of such warranties by Lessor of the Equipment.

ARTICLE X

Section 10.01. Purchase Option. Lessee shall have the option to purchase all of the Equipment listed in a Lease, upon giving written notice to Lessor at least 30, but not more than 120, days before the date of purchase, at the following times and upon the following terms:

(a) From and after the date specified in the related Schedule (the "Purchase Option Commencement Date"), on the Rental Payment dates specified in each Lease, upon payment in full of the Rental Payments then due under such Lease plus the then applicable Purchase Price, and any prepayment premium on the unpaid balance as set forth in the applicable Schedule; or

(b) In the event of substantial damage to or destruction or condemnation of substantially all of the Equipment listed in a Lease, on the day specified in Lessee's notice to Lessor of its exercise of the Purchase Option upon payment in full to Lessor of the Rental Payments then due under such Lease plus the then applicable Purchase Price; or

(c) Upon the expiration of the Lease Term, upon payment in full of all Rental Payments then due and all other amounts then owing under the Lease, and the payment of $1.00 to Lessor.

ARTICLE XI

Section 11.01. Assignment by Lessor. Lessor's right, title and interest in and to Rental Payments and any other amounts payable by Lessee under any and all of the Leases, and all proceeds therefrom may be assigned and reassigned in whole or in part to one or more assignees or subassignees by Lessor, without the necessity of obtaining the consent of Lessee; provided, however, that any such assignment, transfer or conveyance to a trustee for the benefit of owners of certificates of participation shall be made in a manner that conforms to any applicable State law. Nothing in this Section 11.01 shall be construed, however, to prevent Lessor from executing any such assignment, transfer or conveyance that does not involve funding through the use of certificates of participation within the meaning of applicable State law, including any such assignment, transfer or conveyance as part of a multiple asset pool to a partnership or trust, interests in which are offered and sold in a private placement or limited offering only to investors whom Lessor reasonably believes are qualified institutional buyers or accredited investors within the meaning of the applicable federal securities law; provided further, however, that in any event, Lessee shall not be required to make Rental Payments, to send notices or to otherwise deal with respect to matters arising under a Lease with or to more than one individual or entity. No

assignment, transfer or conveyance permitted by this Section 11.01 shall be effective until Lessee shall have received a written notice of assignment that discloses the name and address of each such assignee; provided, however, that if such assignment is made to a bank or trust company as trustee or paying agent for owners of certificates of participation, trust certificates or partnership interests with respect to the Rental Payments payable under a Lease, it shall thereafter be sufficient that Lessee receives notice of the name and address of the bank or trust company as trustee or paying agent. During the term of each Lease, Lessee shall keep, or cause to be kept, a complete and accurate record of all such assignments in form necessary to comply with Section 149 of the Code. Lessee shall retain all such notices as a register of all assignees and shall make all payments to the assignee or assignees designated in such register. Lessee shall not have the right to and shall not assert against any assignee any claim, counterclaim or other right Lessee may have against Lessor or the Vendor. Assignments in part may include without limitation assignment of all of Lessor's rights in, to and under the Lease related to the Equipment listed in a particular Lease. The option granted in this Section may be separately exercised from time to time with respect to the Equipment listed in each Lease, but such option does not permit the assignment of less than all of Lessor's interests in the Equipment listed in a single Lease.

Section 11.02. Assignment and Subleasing by Lessee. None of Lessee's right, title, and interest in, to and under any Lease or any portion of the Equipment may be assigned or encumbered by Lessee without prior written consent of Lessor.

ARTICLE XII

Section 12.01. Events of Default Defined. Any of the following events shall constitute an "Event of Default" under a Lease, subject to Section 3.03:

(a) Failure by Lessee to pay any Rental Payment or other payment required to be paid under any Lease at the time specified herein;

(b) Failure by Lessee to observe and perform any covenant, condition or agreement on its part to be observed or performed, other than as referred to in subparagraph (a) above, for a period of 30 days after written notice specifying such failure and requesting that it be remedied is given to Lessee by Lessor, unless Lessor shall agree in writing to an extension of such time prior to its expiration; provided that, if the failure stated in the notice cannot be corrected within the applicable period, Lessor will not unreasonably withhold its consent to an extension of such time if corrective action is instituted by Lessee within the applicable period and diligently pursued until the default is corrected;

(c) Any statement, representation or warranty made by Lessee in or pursuant to any Lease or its execution, delivery or performance shall prove to have been false, incorrect, misleading, or breached in any material respect on the date when made;

(d) Any default occurs under any other agreement for borrowing money or receiving credit under which Lessee may be obligated as borrower, if such default consists of (i) the failure to pay any indebtedness when due or (ii) the failure to perform any other obligation thereunder and gives the holder of the indebtedness the right to accelerate the indebtedness;

(e) Lessee shall (i) apply for or consent to the appointment of a receiver, trustee, custodian or liquidator of Lessee, or of all or a substantial part of the assets of Lessee, (ii) be unable, fail or admit in writing its inability generally to pay its debts as they become due, (iii) make a general assignment for the benefit of creditors, (iv) have an order for relief entered against it under applicable federal bankruptcy law, or (v) file a voluntary petition in bankruptcy or a petition or an answer seeking reorganization or an arrangement with creditors or taking advantage of any insolvency law or any answer admitting the material allegations of a petition filed against Lessee in any bankruptcy, reorganization or insolvency proceeding;

(f) An order, judgment or decree shall be entered by any court of competent jurisdiction, approving a petition or appointing a receiver, trustee, custodian or liquidator or Lessee or of all or a substantial part of the assets of Lessee, in each case without its application, approval or consent, and such order, judgment or decree shall continue unstayed and in effect for any period of 30 consecutive days; or

(g) Lessee shall consolidate, merge or otherwise combine with any other entity, or sell, lease or dispose of all or a substantial portion of its assets.

Section 12.02. Remedies on Default. Whenever any Event of Default exists, Lessor shall have the right, at its sole option without any further demand or notice, to take one or any combination of the following remedial steps:

(a) Lessor may by notice in writing to Lessee terminate the Lease, whereupon all rights of Lessee to use the Equipment shall cease and terminate;

(b) By written notice to Lessee, Lessor may demand that Lessee pay, as liquidated damages for loss of a bargain and not as a penalty, all unpaid Rental Payments payable by Lessee pursuant to such Lease and other amounts payable by Lessee under such Lease to the end of the then current Original Term or Renewal Term;

(c) With or without terminating the Lease Term under such Lease, Lessor may request that Lessee at Lessee's expense promptly return any or all of such Equipment to the possession of Lessor at such place within the United States as Lessor shall specify. In such event, Lessor shall use its best efforts to sell or lease such Equipment or, for the account of Lessee, sublease such Equipment. If Lessee returns the Equipment and Lessor sells, leases or otherwise disposes of any or all of the Equipment, Lessor shall apply the proceeds of such sale, lease or other disposition in the following order of priority: FIRST, to pay all of Lessor's costs, charges and expenses incurred in taking, holding, repairing, selling, leasing or otherwise disposing of Equipment, then SECOND, to the extent not previously paid by Lessee, to pay Lessor all Rental Payments under the applicable Lease through the termination date, then THIRD, to pay the Purchase Price applicable as of the end of the then current Original Term or Renewal Term, as set forth in the Schedule for such Equipment, then FOURTH to pay any remainder to Lessee. Lessee shall not be liable for any deficiency after sale, lease or other disposition of the Equipment. If Lessee elects not to return the Equipment, Lessor is entitled to payment of unpaid Rental Payments through the date of Lessor's request to return the Equipment plus the then applicable Purchase Price, as set forth in the applicable Schedule for such

Equipment. The exercise of any such remedies respecting any such Event of Default shall not relieve Lessee of any other liabilities under any other Lease or the Equipment listed therein; and

(d) Lessor may take whatever action at law or in equity may appear necessary or desirable to enforce its rights under such Lease.

Section 12.03. No Remedy Exclusive. No remedy herein conferred upon or reserved to Lessor is intended to be exclusive and every such remedy shall be cumulative and shall be in addition to every other remedy given under a Lease now or hereafter existing at law or in equity. No delay or omission to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver thereof, but any such right or power may be exercised from time to time and as often as may be deemed expedient. In order to entitle Lessor to exercise any remedy reserved to it in this Article it shall not be necessary to give any notice other than such notice as may be required in this Article.

Section 12.04. Application of Moneys. Any net proceeds from the exercise of any remedy under this Agreement, including the application specified in Section 12.02(b) (after deducting all expenses of Lessor in exercising such remedies including without limitation all expenses of taking possession, storing, reconditioning and selling or leasing Equipment and all brokerage, auctioneer's or attorney's fees), shall be applied as follows:

(a) If such remedy is exercised solely with respect to a single Lease, Equipment listed in such Lease or rights thereunder, then to amounts due pursuant to such Lease and other amounts related to such Lease or such Equipment.

(b) If such remedy is exercised with respect to more than one Lease, Equipment listed in more than one Lease or rights under more than one Lease, then to amounts due pursuant to such Leases pro rata.

ARTICLE XIII

Section 13.01. No Fees Paid by Lessor. Lessor hereby certifies that it has not paid or has not promised to pay, directly or indirectly, a fee to any person not regularly employed by Lessor to act as an intermediary between Lessee and Lessor for the purpose of influencing any transaction in connection with this Agreement or any Lease.

Section 13.02. Notices. All notices, certificates or other communications under any Lease shall be sufficiently given and shall be deemed given when delivered or mailed by registered mail, postage prepaid, or delivered by overnight courier, or sent by facsimile transmission (with electronic confirmation) to the parties hereto at the addresses immediately after the signatures to this Agreement (or at such other address as either party hereto shall designate in writing to the other for notices to such party) and to any assignee at its address as it appears on the registration books maintained by Lessee.

Section 13.03. Release and Indemnification. To the extent permitted by law, but only from legally available funds, Lessee shall indemnify, protect, hold harmless, save and keep harmless Lessor from and against any and all liability, obligation, loss, claim, tax and damage

whatsoever, regardless of cause thereof, and all expenses in connection therewith (including, without limitation, counsel fees and expenses, penalties connected therewith imposed on interest received) arising out of or as a result of (a) the entering into of this Agreement or any Lease, (b) the ownership of any item of the Equipment, (c) the ordering, acquisition, use, operation, condition, purchase, delivery, rejection, storage or return of any item of the Equipment, (d) any accident in connection with the operation, use, condition, possession, storage or return of any item of the Equipment resulting in damage to property or injury to or death to any person, and/or (e) the breach of any covenant in a Lease or any material misrepresentation contained in a Lease. The indemnification arising under this paragraph shall continue in full force and effect notwithstanding the full payment of all obligations under all Leases or the termination of the Lease Term under all Leases for any reason.

Section 13.04. Binding Effect. Each Lease shall inure to the benefit of and shall be binding upon Lessor and Lessee and their respective successors and assigns.

Section 13.05. Severability. In the event any provision of any Lease shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision hereof. Any provisions in this Lease which are in conflict with any statute, law or applicable rule shall be deemed omitted, modified or altered to conform thereto.

Section 13.06. Amendments, Changes and Modifications. Each Lease may only be amended by Lessor and Lessee in writing.

Section 13.07. Execution in Counterparts. Each Lease may be simultaneously executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

Section 13.08. Applicable Law. Each Lease shall be governed by and construed in accordance with the laws of the State.

Section 13.09. Captions. The captions or headings in this Agreement and in each Lease are for convenience only and in no way define, limit or describe the scope or intent of any provisions or sections of this Agreement or any Lease.

IN WITNESS WHEREOF, Lessor and Lessee have caused this Agreement to be executed in their names by their duly authorized representatives as of the date first above written.

LESSOR:
Banc of America Public Capital Corp
2059 Northlake Parkway, 4th Floor
Tucker, Georgia 30084

By _____

Title _____

LESSEE:

By _____

Title _____

(Seal)

Attest:

By _____

Title _____

EXHIBIT A

SCHEDULE OF PROPERTY NO. _____

Re: Master Equipment Lease/Purchase Agreement, dated as of _____, between Banc of America Public Capital Corp, as Lessor, and _____, as Lessee

1. Defined Terms. All terms used herein have the meanings ascribed to them in the above-referenced Master Equipment Lease/Purchase Agreement (the "Master Equipment Lease").

2. Equipment. The following items of Equipment are hereby included under this Schedule of the Master Equipment Lease.

Quantity	Description	Serial No.	Model No.	Location

3. Payment Schedule.

(a) Rental Payments. The Rental Payments shall be in such amounts and payable on such dates as set forth in the Rental Payment Schedule attached to this Schedule as Exhibit A-1. Rental Payments shall commence on the date on which the Equipment listed in this Schedule is accepted by Lessee, as indicated in an Acceptance Certificate substantially in the form of Exhibit B to the Master Equipment Lease or the date on which sufficient moneys to purchase the Equipment are deposited for that purpose with an Acquisition Fund Custodian, whichever is earlier.

(b) Purchase Price Schedule. The Purchase Price on each Rental Payment date for the Equipment listed in this Schedule shall be the amount set forth for such Rental Payment date in the "Purchase Price" column of the Rental Payment Schedule attached to this Schedule. The Purchase Price is in addition to all Rental Payments then due under this Schedule (including the Rental Payment shown on the same line in the Rental Payment Schedule).

4. Representations, Warranties and Covenants. Lessee hereby represents, warrants and covenants that its representations, warranties and covenants set forth in the Master Equipment Lease are true and correct as though made on the date of commencement of Rental Payments on this Schedule. Lessee further represents and warrants that no material adverse change in Lessee's financial condition has occurred since the date of the Master Equipment Lease.

5. The Lease. The terms and provisions of the Master Equipment Lease (other than to the extent that they relate solely to other Schedules or Equipment listed on other Schedules) are hereby incorporated into this Schedule by reference and made a part hereof.

[OPTION: IF ACQUISITION FUND AGREEMENT IS USED:

6. Acquisition Amount. The Acquisition Amount for the Equipment described in this Schedule, to be deposited in the Acquisition Fund designated "_____" for Account No. _____, is $_____.

OR IF VENDOR PAID DIRECTLY, USE:

6. Acquisition Amount. The Acquisition Amount for the Equipment described in this Schedule to be paid to the Vendor is $ _____.]

[OPTION: IF ACQUISITION FUND AGREEMENT IS USED:

7. Acquisition Period. The Acquisition Period applicable to this Schedule shall end at the conclusion of the ____ month following the date hereof.]

Dated: _____

LESSOR:
Banc of America Public Capital Corp
2059 Northlake Parkway, 4th Floor
Tucker, Georgia 30084

By _____
Title _____

LESSEE:

By _____
Title _____

(Seal)

Attest:

By _____

Title _____

EXHIBIT A-1

RENTAL PAYMENT SCHEDULE

Rental Payment Date	Rental Payment Amount	Interest Portion	Principal Portion	Purchase Price[*]

[*The Purchase Option Commencement Date shall be _____. The Purchase Price payable (i) on any Rental Payment date is the amount equal to the aggregate principal portion of the remaining Rental Payments after payment of the Rental Payment payable on such Rental Payment date, plus a prepayment premium described below which is in addition to the amount stated in the "Purchase Price" column above and (ii) on any date other than a Rental Payment date is the amount equal to the aggregate principal portion of the remaining Rental Payments plus an amount equal to the interest portion of such Rental Payments accrued thereon to such date, without such prepayment premium or penalty.

Date of Purchase	Premium
	]

For purposes of this Lease, *"Taxable Rate,"* with respect to the interest component of Rental Payments, means an annual rate of interest equal to _____%.

Lessee:

_____

By _____

Title _____

After payment of the applicable Purchase Price, Lessee will own the related Equipment, free and clear of any obligations under the related Lease.

EXHIBIT B

ACCEPTANCE CERTIFICATE

Banc of America Public Capital Corp
2059 Northlake Parkway, 4th Floor
Tucker, Georgia 30084

Re: Schedule of Property No. _____, dated _____, to Master Equipment Lease/Purchase Agreement, dated as of _____, between Banc of America Public Capital Corp, as Lessor, and _____, as Lessee

Ladies and Gentlemen:

In accordance with the Master Equipment Lease/Purchase Agreement (the "Agreement"), the undersigned Lessee hereby certifies and represents to, and agrees with Lessor as follows:

1. All of the Equipment (as such term is defined in the Agreement) listed in the above-referenced Schedule of Property (the "Schedule") has been delivered, installed and accepted on the date hereof.

2. Lessee has conducted such inspection and/or testing of the Equipment listed in the Schedule as it deems necessary and appropriate and hereby acknowledges that it accepts the Equipment for all purposes.

3. Lessee is currently maintaining the insurance coverage required by Section 7.02 of the Agreement.

4. No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Agreement) exists at the date hereof.

Date: _____

LESSEE:

_____

By _____
Title _____

(Seal)

EXHIBIT C

[CLERK/SECRETARY] CERTIFICATE

The undersigned, a duly elected and acting [Clerk/Secretary] of _____ ("Lessee") certifies as follows:

A. The following listed persons are duly elected and acting officials of Lessee (the "Officials") in the capacity set forth opposite their respective names below and that the facsimile signatures are true and correct as of the date hereof;

B. The Officials are duly authorized, on behalf of Lessee, to negotiate, execute and deliver the Master Equipment Lease/Purchase Agreement dated as of _____ and the Schedule(s) thereunder and all future Schedule(s) (the "Agreements") by and between _____ and Banc of America Public Capital Corp and these Agreements are binding and authorized Agreements of Lessee, enforceable in all respects in accordance with their terms.

Name of Official	Title	Signature
_____	_____	_____
_____	_____	_____
_____	_____	_____

Dated _____ By _____

Title _____

(The signer of this Certificate cannot be listed above as authorized to execute the Agreements.)

EXHIBIT D

OPINION OF COUNSEL TO LESSEE

Banc of America Public Capital Corp
2059 Northlake Parkway, 4th Floor
Tucker, Georgia 30084

Re: Schedule of Property No. _____, dated _____, to Master Equipment Lease/Purchase Agreement, dated as of _____, between Banc of America Public Capital Corp, as Lessor, and _____, as Lessee

Ladies and Gentlemen:

As legal counsel to _____ ("Lessee"), I have examined (a) an executed counterpart of a certain Master Equipment Lease/Purchase Agreement, dated as of _____, and Exhibits thereto by and between Banc of America Public Capital Corp ("Lessor") and Lessee (the "Agreement"), and an executed counterpart of Schedule of Property No. _____, dated _____, by and between Lessor and Lessee (the "Schedule"), which, among other things, provides for the lease of certain property listed in the Schedule (the "Equipment"), (b) an executed counterpart of the ordinances or resolutions of Lessee which, among other things, authorize Lessee to execute the Agreement and the Schedule and (c) such other opinions, documents and matters of law as I have deemed necessary in connection with the following opinions. The Schedule and the terms and provisions of the Agreement incorporated therein by reference together with the Rental Payment Schedule attached to the Schedule are herein referred to collectively as the "Lease".

Based on the foregoing, I am of the following opinions:

1. Lessee is a [public body corporate and politic, duly organized/municipality duly created] and existing under the laws of the State, and [has a substantial amount of the following sovereign powers: (a) the power to tax, (b) the power of eminent domain, and (c) police power][is a political subdivision of a state within the meaning of Section 103(c) of the Internal Revenue Code of 1986, as amended (the "Code"), and the obligations of Lessee under the Agreement will constitute an obligation of Lessee within the meaning of Section 103(a) of the Code, notwithstanding Section 103(b) of the Code];

2. Lessee has the requisite power and authority to lease and acquire the Equipment and to execute and deliver the Lease and to perform its obligations under the Lease;

3. The Lease has been duly authorized, approved, executed and delivered by and on behalf of Lessee and the Lease is a valid and binding obligation of Lessee enforceable in accordance with its terms;

4. The authorization, approval, execution and delivery of the Lease and all other proceedings of Lessee relating to the transactions contemplated thereby have been performed in

accordance with all open meeting laws, public bidding laws and all other applicable state or federal laws;

5. There is no proceeding pending or threatened in any court or before any governmental authority or arbitration board or tribunal that, if adversely determined, would adversely affect the transactions contemplated by the Lease or the security interest of Lessor or its assigns, as the case may be, in the Equipment thereunder; and

6. The portion of rentals designated as and constituting interest paid by Lessee and received by Lessor is excluded from Lessor's gross income for federal income tax purposes under Section 103 of the Code; and such interest is not a specific item for purposes of the federal individual or corporate alternative minimum taxes.

All capitalized terms herein shall have the same meanings as in the Lease unless otherwise provided herein. Lessor and its successors and assigns, and any counsel rendering an opinion on the tax-exempt status of the interest components of the Rental Payments, are entitled to rely on this opinion.

Yours truly,

EXHIBIT E

ESSENTIAL USE/SOURCE OF FUNDS CERTIFICATE

Banc of America Public Capital Corp
2059 Northlake Parkway, 4th Floor
Tucker, Georgia 30084

Re: Master Equipment Lease/Purchase Agreement dated _____,
Schedule of Property No. _____ dated _____

This certificate confirms and affirms that the Equipment described in the Agreement referenced above is essential to the governmental, municipal or public purposes or functions of Lessee or to the services Lessee provides its citizens. Further, Lessee has an immediate need for, and expects to make immediate use of, substantially all such Equipment, which need is not temporary or expected to diminish in the foreseeable future. Such Equipment will be used by Lessee only for the purpose of performing one or more of Lessee's governmental or proprietary functions permitted under the Act (as defined in the Agreement referenced above).

Lessee expects and anticipates adequate funds to be available for all future payments or rent due after the current budgetary period, subject to annual appropriation.

[Lessee]

By _____

Name _____

Title _____