The City of Gainesville
The Gainesville Police Department
Performance Contract 02/01/2006
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PERFORMANCE CONTRACTING AGREEMENT

between

The City of Gainesville Florida

and

Siemens Building Technologies, Inc.

TABLE OF ARTICLES

Number:-217-N-2975-00

Article 1
AGREEMENT

THIS **AGREEMENT**, is made this 1st day of February , 2006 by and between Siemens Building Technologies, Inc., ("SIEMENS") and the party identified below as CLIENT.

CLIENT:
The City of Gainesville
200 East University Avenue
Mail Station #42
Gainesville, Florida 32602

DESIGNATED REPRESENTATIVE: **Russ Blackburn**
PHONE: 352-334-5010 FAX: 352-334-3119

Siemens Building Technologies, Inc. (SIEMENS)
8940 Western Way, Suite One
Jacksonville, Florida 32256

DESIGNATED REPRESENTATIVE: **Steven A. Moore**
PHONE: 904-464-0808 FAX: 904-464-0037

For services in connection with the following project

Project The City of Gainesville Police Department

721 North West 6th Street
PO Box 1250
Gainesville, Florida 32602-1250

Articles and Attachments

This Agreement shall consist of the following documents ("Contract Documents") which are acknowledged by CLIENT and SIEMENS and incorporated herein by this reference:

Articles

1. Agreement
2. Glossary
3. General
4. Performance Guarantee
5. Work BY SIEMENS
6. CLIENT'S Responsibility
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10. Insurance and Allocation of Risk
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13. Maintenance Services Technical Support Program

Attachments

Exhibit A	Scope of Work and Services
Exhibit B	Payment Schedules
Exhibit C	Performance Assurance
Exhibit D	Technical Audit
Exhibit E	Interlocal Cooperation
Exhibit F	Siemens Financial Services Agreement
Exhibit G	Revisions to the Technical Audit

The Agreement, when accepted in writing by CLIENT and approved by an authorized representative of SIEMENS, constitutes the entire, complete and exclusive agreement between the parties. The above documents constitute the entire Agreement between CLIENT and SIEMENS relative to the project scope as stated in Exhibit A and supersede all prior and contemporaneous negotiations, statements, representations, agreements, letters of intent, awards, or proposals, either written or oral relative to the same. This Agreement may be modified only by a written instrument signed by both parties.

COMPENSATION/TERMS OF PAYMENT:

As full consideration for the performance of the Work and Services set forth in Exhibit A and C, CLIENT shall pay to SIEMENS the Contract Sum in such manner as agreed in Exhibit B and in accordance with the payment terms and conditions established by the Contract Documents.

Agreed for CLIENT

(Signature) by: _____

Print Name and Title: _____

Agreed for SIEMENS Building Technologies, Inc.

(Signature) by: _____

Print Name and Title: _____

Article 2
Glossary

The following terms shall, for all purposes of the Contract Documents comprising this Agreement, have the meanings stated herein, unless the context otherwise specifies or requires or unless otherwise defined in the Contract Documents:

"Acceptance" means the CLIENT has signed the Certificate of Substantial Completion.

"Acceptance Date" means the date on which the CLIENT signs the Certificate of Substantial Completion.

"Accumulated Realized Savings" means the sum of the actual savings achieved from the Effective Contract Date of this Agreement through the end of the current Annual Period, derived from the sum of Measured & Verified Savings plus the Stipulated Savings.

"Accumulated Guaranteed Savings" means the sum of the Guaranteed Measured & Verified Savings plus the Stipulated Savings from the Guarantee Date of the Agreement through the end of the current Annual Period.

"Annual Guaranteed Savings" are the Measured & Verified Savings and the Stipulated Savings that occur in any Annual Period of the Guarantee Term.

"Annual Period" means a twelve (12) month period beginning on the Guarantee Date or on any anniversary date thereof.

"Baseline" means the annual period or multiple annual periods prior to project commencement which has been agreed upon and are stated in Exhibit C. The energy usage, operating practices, and facility and equipment in place prior to FIM implementation represent the basis on which all future energy and operating usage will be compared for the determination of savings.

"BTU" a unit of thermal energy defined as a British Thermal Unit.

"Certificate of Substantial Completion" means documentation executed by CLIENT agreeing that the Work, or a designated portion of the Work, is Substantially Complete in accordance with the Agreement and such Work is accepted by the CLIENT.

"Construction Period" means the period between the Effective Contract Date and the first day of the month following the Substantial Completion Date.

"Construction Period Savings" means the actual accumulated Measured & Verified Savings plus the Stipulated Savings achieved from the Effective Contract Date of this Agreement until the Guarantee Date.

"Contracted Baseline" means the future annual period or multiple annual periods post FIM implementation agreed upon and stated in Exhibit C that define the energy usage, operating practices, and facility and equipment in place post FIM implementation and represent the basis on which the guaranteed savings are calculated.

"Effective Contract Date" is the date appearing at the top of this contract, unless specifically indicated otherwise.

"Energy Conservation Measure" or ***"ECM"*** means the equipment, devices, materials and/or software as installed by SIEMENS at the Facilities, or as repaired or replaced by CLIENT hereunder, for the purpose of improving the efficiency of utility consumption.

"Equipment" means the installed products to be provided by SIEMENS as described in the Scope of Work and Services, Exhibit A.

"Escalation Factor" means an annual escalation percentage to be applied to the previous years Energy Savings, Operational Savings and Technical Support Program, beginning and occurring on dates outlined in Performance Assurance, Exhibit C.

"Facilities" means those building(s) or structure(s) where Work will be installed or implemented. It shall have the same meaning as the term Site.

"Facility Improvement Measures" or ***"FIMs"*** means the methods, techniques, application of know-how, installation of devices or otherwise, described in the Scope of Work and Services, Exhibit A, that are undertaken by SIEMENS as a result of this Agreement with the intent of generating net savings or efficiencies at or in connection with the operation of the Facilities or the Site, including without limitation the ECMs, OIMs, TIMs, USMs, WCMs, SCMs and any other, non-conservation-related activities, means or methods.

"Guarantee Date" is the date at which Certificate of Substantial Completion is executed by the CLIENT.

"Guaranteed Measured & Verified Savings" means the Measured & Verified Savings guaranteed to be achieved as described in the Performance Guarantee, Exhibit C.

"Guaranteed Savings" means the amount of savings that this Agreement anticipates will be achieved at the Facilities defined in this Agreement, calculated as the aggregate of the Measured & Verified Savings and the Stipulated Savings amounts identified in the Performance Assurance, Exhibit C, but not to exceed the aggregate of the Contract Sum; the Performance Assurance TSP Payments; and the CLIENT's cost of financing the Work.

"kW and kWh" means kilowatt and kilowatt hour, respectively.

"Maintenance Services TSP" means the Services performed under a Technical Support Program as stated in the Scope of Work and Services, Exhibit A.

"Measured and Verified Savings" means those savings that can be measured and verified by the methodology as set forth in Performance Assurance Exhibit C.

"Operational Improvement Measure" or ***"OIM"*** means the programs, practices, methodologies, devices, materials and/or software as installed or instituted by SIEMENS at the Facilities, or as instituted by CLIENT hereunder, for the purpose of improving the efficiency of operations activities, operational costs and/or operational results as described in the Scope of Work and Services Exhibit A.

"Performance Assurance" is the process of ascertaining that the FIMs defined in Scope of Work and Services Exhibit A are performing at the guaranteed values that are defined in Performance Assurance Exhibit C.

"Performance Assurance TSP" means the Services performed to monitor and report the performance relative to the guarantees defined in Performance Assurance Exhibit C.

"Performance Guarantee Period" means the entire period from the Guarantee Date of this Agreement until the termination or expiration of this Agreement as set forth herein.

"Realized Annual Savings" means the actual savings achieved by the CLIENT during an Annual Period, calculated as the sum of the Measured & Verified Savings plus the Stipulated Savings.

"Savings Excess" means the Realized Annual Savings less Annual Guaranteed Savings for the Annual Period. If the amount is zero or greater the Guarantee Savings in Performance Assurance Exhibit C has been fulfilled.

"Savings Shortfall" means the Realized Annual Savings less Annual Guaranteed Savings for the Annual Period. If the amount is less than zero the Guarantee Savings in Performance Assurance Exhibit C has not been fulfilled.

"Services" means those services to be provided by SIEMENS as described in the Scope of Work and Services, Exhibit A and Performance Assurance Exhibit C.

"Site" shall have the same meaning as Facilities.

"Stipulated Savings" are the savings that have been mutually agreed upon and stipulated to by SIEMENS and the CLIENT prior to or upon implementation of the FIMs. The stipulated savings for each Annual Period, with the corresponding Escalation Factor if applicable, are set forth in Performance Assurance Exhibit C.

"*Substantial Completion*" or **"*Substantially Complete*"** means the first to occur of the following: (i) the Work, or any identifiable portion thereof, is sufficiently complete, in accordance with the provisions of this Agreement relating to the scope of the Work, that CLIENT will be able to realize from such Work substantially all of the practical benefits intended to be gained there from, or otherwise to employ the Work or the FIMs associated therewith for their intended purposes; or (ii) temporary, qualified or final certificates of occupancy, if required, have been issued with respect to such portions of the Work by the appropriate public authority.

"*Technical Support Program*" or **"*TSP*"** is a plan detailing the tasks, material, and responsibilities provided by SIEMENS to the CLIENT during a specified time period defined in the Scope of Work and Services, Exhibit A and the Performance Assurance Exhibit C.

"*Term*" is a stipulated period of time starting on Effective Contract Date of this Agreement and ending at the termination or expiration of this Agreement as set forth herein.

"*Technology Improvement Measure"* *or* ***"TIM"*** means the application of new technology methods, devices, materials and/or software as installed or instituted by SIEMENS at the Facilities for the purpose of improving the efficiency of operations activities, operational costs and/or utility costs as described in the Scope of Work and Services Exhibit A.

"Therm" is a measure of energy equal to 100,000 BTUs.

"Total Guaranteed Savings" are the amount of savings identified to be achievable based on calculations and adjustments as set forth in Performance Assurance Exhibit C. Total Guaranteed Savings include all savings guaranteed to be achieved during each Annual Period of the Term and may also include Construction Period Savings if specified in Performance Assurance, Exhibit C.

"Utility Services Measure" or ***"USM"*** means the application of Utility services methods and technology as described in the Scope of Work and Services Exhibit A.

"Work" means collective labor, equipment and services comprising the FIMs to be performed by SIEMENS as described in the Scope of Work and Service Exhibit A.

"Water Conservation Measure" or ***"WCMs"*** means the equipment, devices, materials, programs, practices, methodologies and/or software as installed or coordinated by SIEMENS at the facility for the purpose of improving the efficiency of the facility's water consumption, as described in Scope of Work and Services, Exhibit A.

"Waste Conservation Measure" or ***"SCMs"*** means the equipment, devices, materials, programs, practices, methodologies and/or software as installed or coordinated by SIEMENS at the facility for the purpose of improving the efficiency of operations, activities, operational costs and/or operations results, as described in Scope of Work and Services, Exhibit A.

Article 3
General

3.1 CLIENT hereby engages and SIEMENS hereby accepts the engagement to perform and provide the Facility Improvement Measures, including Energy Conservation Measures, and such other goods and services (collectively the "Work") set forth in Exhibit A hereof and incorporated herein, in connection with the Project and in accordance with the terms and conditions of this Agreement.

3.2 SIEMENS shall perform the Work as an independent contractor with exclusive control of the manner and means of performing the Work in accordance with the requirements of this Agreement. SIEMENS has no authority to act or make any agreements or representations on behalf of CLIENT. This Agreement is not intended, and shall not be construed to create, between CLIENT and SIEMENS, the relationship of principal and agent, joint venturers, co-partners or any other such relationship, the existence of which is hereby expressly denied. No employee or agent of SIEMENS shall be, or shall be deemed to be, an employee or agent of CLIENT.

3.3 SIEMENS represents that it is duly authorized to do business in all locations where the Work and Service are to be performed. CLIENT represents, warrants and covenants to SIEMENS that

(a) It has all requisite corporate power and statutory authority to enter into this Agreement, and that its execution hereof has been duly authorized and does not and will not constitute a breach or violation of any of CLIENT's organizational documents, any applicable laws or regulations, or any agreements with third parties;

(b) It has done and will continue to do all things necessary to preserve and keep in full force and effect its existence and the Agreement;

(c) This Agreement is the legal, valid and binding obligation of the CLIENT, in accordance with its terms, and all requirements have been met and procedures have been followed by CLIENT to ensure the enforceability of the Agreement; and

(d) There is not pending, or to CLIENT's best knowledge, threatened, suits, actions, litigation or proceedings against or affecting CLIENT that affect the validity or enforceability of this Agreement.

Article 4
Performance Guarantee

4.1 SIEMENS guarantees that the Guaranteed Savings generated from the Guarantee Date to the last date of the Performance Guarantee Period will be equal to the Total Guaranteed Savings shown in Exhibit C. The measurement and verification calculation methodology for determining the Measured & Verified Savings is set forth in Exhibit C.

4.1.1 General. Except as otherwise provided, energy savings will be calculated for each month of each Annual Savings Period as the product of (a) "units of energy saved" (kWh, Therms, GJ, etc.) multiplied by (b) "cost of energy".

(a) Units of energy saved are computed by a software application which is specified in Exhibit C. Units of energy saved are calculated by subtracting current period measured units of energy consumed from the adjusted Baseline units of energy defined in Article 5 of Exhibit C. Adjustments to the Baseline energy units are based on factors such as weather, occupancy, operating hours, etc., and changes to the Contracted Baseline conditions and operating practices as defined in Article 7 of Exhibit C.

(b) Costs of energy are defined in Article 6 of Exhibit C, Utility Rate Structures and Escalation Rates.

4.2 Any future escalation factors applied to utility, energy or other costs which will be applied are set forth in Exhibit C. SIEMENS and the CLIENT agree that the Baseline data which is set forth in Exhibit C is an accurate reflection of the existing facility, equipment, operation, business use and energy usage, and that this information will be the basis on which all future energy use will be referenced in the determination of energy savings.

4.3 SIEMENS and the CLIENT agree that the Contracted Baseline defined in Exhibit C will represent the new operating and/or equipment profile of the facility resulting from the FIM implementation. The Performance Guarantee is dependent upon and is subject to the express condition that the CLIENT operate and maintain their facilities within the Contracted Baseline parameters during the entire term of the Performance Guarantee Period.

4.4 The CLIENT agrees to notify SIEMENS prior to or within 30 days of any:

(a) Changes to operating schedules, strategies, equipment and conditions in the Facility from those described in the Contracted Baseline data.

(b) Any other changes in or at the Facility that may increase or decrease energy usage, including without limitation changes in operations, business conducted, occupancy, hours of operation, and energy consuming equipment and malfunctions, failures and related changes in energy consuming equipment; and

(c) Any damage to, destruction of the FIM Work.

4.5 SIEMENS agrees to respond and advise the CLIENT within 30 days of the receipt the change notice that SIEMENS will:

(a) Continue the Guarantee Savings Program without adjustments;

(b) Require an adjustment to the Guarantee Savings Program as a result of the change; or

(c) Terminate the Performance Guarantee.

4.6 Failure of the CLIENT to notify SIEMENS of any changes shall void the Performance Guarantee.

4.7 Performance Guarantee Period savings reconciliation as identified in Section 4.4 will be performed at the end of each annual period.

(a) Within thirty (30) days of the Guarantee Date the Construction Savings shall be reconciled and added to the Accumulated Realized Savings.

(b) At each annual reconciliation the Realized Annual Savings shall be applied to the Accumulated Realized Savings.

1) Should the Accumulated Realized Savings be greater than the Accumulated Guaranteed Savings a Savings Excess shall be recorded.

2) Should the Accumulated Realized Savings be less than the Accumulated Guaranteed Savings the Savings Shortfall shall be recorded.

(c) Savings Shortfall shall be:

1) Savings Shortfall will be paid by SIEMENS within in thirty (30) days following the CLIENT's acceptance of the reconciliation.

(d) If SIEMENS can correct a shortfall through operational improvement at no expense to the CLIENT and with no future operational expenses and the CLIENT declines to allow such operational improvement then any future Savings Shortfall that the improvement would have corrected will be stipulated and added to the savings on a annual basis.

4.8 The Performance Guarantee is dependent upon and is subject to the express condition that the CLIENT enter into and maintain, during the entire term of the Performance Guarantee Period, the Performance Assurance TSP. If the CLIENT fails to enter into, breaches, cancels or otherwise causes the termination of the Performance Assurance TSP this Performance Guarantee shall terminate immediately and be void and of no force or effect. The services to be provided under the Performance Assurance TSP are defined in Exhibit A.

4.9 The payments and credits based on Savings Shortfalls, if any, are the sole remedy of the CLIENT for this Performance Guarantee. Any payments made or to be made to the CLIENT under the terms of this Performance Guarantee shall not exceed the payments actually made by CLIENT to SIEMENS for but not to exceed the aggregate of the Contract Sum; the Performance Assurance TSP Payments; and the CLIENT cost of financing the Work for the Contract Sum.

4.10 Performance Assurance TSP is the technical services to be provided by SIEMENS to the CLIENT during the Performance Guarantee Period, commencing on the Guarantee Date. Performance Assurance TSP is defined in the Glossary and described in the Scope of Services Exhibit A.

(a) The CLIENT represents that all existing equipment (not installed by SIEMENS under this Agreement) deemed necessary to achieve the Performance Guarantee is in satisfactory working condition. Prior to the beginning of the Guarantee Period SIEMENS will have inspected all such existing equipment and report any deficiencies to the CLIENT.

(b) If the existing equipment or Equipment installed by SIEMENS is altered or moved by any person, including CLIENT, other than SIEMENS or a person authorized by SIEMENS, CLIENT shall immediately notify SIEMENS in writing, and SIEMENS reserves the right to perform a reacceptance test on, or if necessary a re-commissioning of, the system at CLIENT's expense.

4.11 SIEMENS will have no liability or obligation to continue providing Performance Assurance TSP Services or any Guaranteed Savings under any Performance Guarantee in the event CLIENT fails to:

(a) Authorize a re-acceptance test or re-commissioning that SIEMENS reasonably deems necessary.

(b) Provide the access to any Site where Work is to be performed as required by the Contract Documents.

(c) Service and maintain all equipment involved with the FIMs defined in the Scope of Work and Services, Exhibit A in accordance with the manufacturers' recommendations.

(d) Provide SIEMENS with accurate Facility operating information, including energy usage and cost, executed preventive maintenance and repair records, building or equipment additions, and occupancy levels during each Annual Period, as soon as such information becomes available to the CLIENT.

4.12 Should the CLIENT decide to discontinue the guarantee before the end of the contract period, 30 days notice will be given and one of the following will apply:

(a) SIEMENS will cancel the Performance Assurance TSP and the CLIENT will reinvest the avoided cost with SIEMENS into building improvements and services that improve the overall building(s) performance which are implemented by SIEMENS.

(b) SIEMENS will cancel the Performance Assurance TSP and the CLIENT will pay to SIEMENS 100% of the remaining value left in the TSP Annual Period.

Article 5

Work by SIEMENS

5.1 SIEMENS will perform the Work expressly described in this Agreement and in any work release documents or change orders that are issued under this Agreement and signed by both parties. The Work performed by SIEMENS shall be conducted in a manner consistent with the degree of care and skill ordinarily exercised by reputable companies performing the same or similar Work in the same locale acting under similar circumstances and conditions.

5.2 SIEMENS shall perform the Work during its normal working hours, Monday through Friday inclusive, excluding holidays, unless otherwise agreed herein.

5.3 SIEMENS is not required to conduct safety, reacceptance or other tests, install new devices or equipment or make modifications to any Equipment beyond the Scope set forth in this Agreement. Any CLIENT request to change the Scope or the nature of the Work must be in the form of a mutually agreed upon change order, effective only when executed by all parties hereto.

5.4 All reports and drawings specifically prepared for and deliverable to CLIENT pursuant to this Agreement ("Deliverables") shall become CLIENT's property upon full payment to SIEMENS. SIEMENS may retain file copies of such Deliverables. All other reports, notes, calculations, data, drawings, estimates, specifications, manuals, other documents and all computer programs, codes and computerized materials prepared by or for SIEMENS are instruments of SIEMENS' work ("Instruments") and shall remain SIEMENS' property. To the extent specified in Exhibit A, CLIENT, its employees and agents ("Permitted Users") shall have a right to make and retain copies of Instruments except uncompiled code, and to use all Instruments, provided however, the Instruments shall not be used or relied upon by any parties other than Permitted Users, and such use shall be limited to the particular project and location for which the Instruments were provided. All Deliverables and Instruments provided to CLIENT are for Permitted Users' use only for the purposes disclosed to SIEMENS, and CLIENT shall not transfer them to others or use them or permit them to be used for any extension of the Work or any other project or purpose, without SIEMENS' express written consent. Any reuse of Deliverables or Instruments for other projects or locations without the written consent of SIEMENS, or use by any party other than Permitted Users will be at Permitted Users and such other party's sole risk and without liability to SIEMENS; and the Permitted Users, jointly and severally shall indemnify, defend and hold SIEMENS harmless from any claims, losses or damages arising therefrom.

5.5 SIEMENS shall be responsible for any portion of the Work performed by any subcontractor of SIEMENS. SIEMENS shall not have any responsibility, duty or authority to direct, supervise or oversee any contractor of CLIENT or their work or to provide the means, methods or sequence of their work or to stop their work. SIEMENS' work and/or presence at the Site shall not relieve others of their responsibility to CLIENT or to others.

5.6 SIEMENS warrants that:

(a) unless otherwise agreed, all Equipment shall be new and of good quality. Until one year from the date the Equipment is installed all equipment manufactured by SIEMENS or bearing its nameplate will be free from defects in material and workmanship arising from normal use and service.

(b) Labor for all Work, excluding TSP Services, is warranted to be free from defects in workmanship for one year after the Works are performed. TSP services are warranted to be free from defects in workmanship for ninety days after the Services are performed.

5.7 Further:

(a) The limited warranties set forth in Section 5.6 will be void as to, and shall not apply to, any Equipment (i) repaired, altered or improperly installed by any person other than SIEMENS or its authorized representative; (ii) subjected to unreasonable or improper use or storage, used beyond rated conditions, operated other than per SIEMENS' or the manufacturer's instructions, or otherwise subjected to improper maintenance, negligence or accident; (iii) damaged because of any use of the Equipment after CLIENT has, or should have, knowledge of any defect in the Equipment; or (iv) not manufactured, fabricated and assembled by SIEMENS or not bearing SIEMENS nameplate. However, SIEMENS assigns to CLIENT, without recourse, any and all assignable warranties available from any manufacturer, supplier, or subcontractor of such Equipment.

(b) Any claim under the limited warranty granted above must be made in writing to SIEMENS within thirty (30) days after discovery of the claimed defect unless discovered directly by SIEMENS. Such limited warranty only extends to CLIENT and not to any subsequent owner of the Equipment. CLIENT's sole and exclusive remedy for any Equipment or Services not conforming with this limited warranty is limited to, at SIEMENS option, (i) repair or replacement of defective components of covered Equipment, or (ii) re-performance of the defective portion of the Services, or (iii) to the extent previously paid, the issuance of a credit or refund for the original purchase price of such defective component or potion of the Equipment or Services.

(c) SIEMENS shall not be required to repair or replace more than the component(s) of the Equipment or portion of the Works and Services actually found to be defective. SIEMENS warranty liability shall not exceed the purchase price of such item. Repaired or replaced Equipment or Services will be warranted hereunder only for the remaining portion of the original warranty period.

5.8 THE EXPRESS LIMITED WARRANTIES PROVIDED ABOVE ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, STATUTORY, EXPRESS, OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED. SIEMENS MAKES NO WARRANTY, EXPRESS OR IMPLIED, THAT ANY EQUIPMENT PROVIDED HEREUNDER WILL PREVENT ANY LOSS, OR WILL IN ALL CASES PROVIDE THE PROTECTION FOR WHICH IT IS INSTALLED OR INTENDED. THE LIMITED EXPRESS WARRANTIES AND REPRESENTATIONS SET FORTH IN THIS AGREEMENT MAY ONLY BE MODIFIED OR SUPPLEMENTED IN A WRITING SIGNED BY A DULY AUTHORIZED CORPORATE OFFICER OF SIEMENS.

5.9 SIEMENS will not be responsible for the maintenance, repair or replacement of, or Services necessitated by reason of:

(a) Non-maintainable, non-replaceable or obsolete parts of the Equipment, including but not limited to ductwork, shell and tubes, heat exchangers, coils, unit cabinets, casings, refractory material, electrical wiring, water and pneumatic piping, structural supports, cooling tower fill, slats and basins, etc. unless otherwise specifically stated herein; or

(b) Negligence, abuse, misuse, improper or inadequate repairs or modifications, improper operation, lack of operator maintenance or skill, corrosion, erosion, improper or inadequate water treatment by others, electrolytic action, chemical action, failure to comply with manufacturer's operating and environmental requirements, Acts of God, or other reasons beyond its control. Unless expressly agreed in writing, SIEMENS is not responsible for the removal or reinstallation of replacement valves, dampers, or waterflow and tamper switches with respect to pipes and ductwork, including vent or drain system. SIEMENS assumes no responsibility for any service performed on any Equipment other than by SIEMENS or its agents.

Article 6

CLIENT's Responsibilities

6.1 CLIENT, without cost to SIEMENS, shall:

(a) Designate a contact person with authority to make decisions for CLIENT regarding the Work and provide SIEMENS with information sufficient to contact such person in an emergency;

(b) Provide or arrange for 24 hour, 7 day per week access and make all reasonable provisions for SIEMENS to enter any Site where Work is to be performed;

(c) Permit SIEMENS to control and/or operate all building controls, systems, apparatus, equipment and machinery necessary to perform the Work;

(d) Furnish SIEMENS with blueprints, surveys, legal descriptions, waste management plans and all other available information pertinent to the Work and any Site where the Work is to be performed as may be reasonably requested by SIEMENS;

(e) Furnish SIEMENS with all approvals, permits and consents from government authorities and others as may be required for performance of the Work except for those SIEMENS has expressly agreed in writing to obtain;

(f) Notify SIEMENS promptly of all known or suspected Hazardous Materials at the Site, of any contamination of the Site by Oil or Hazardous Material, and of any other conditions requiring special care or which may reasonably be expected to affect the Work, and provide SIEMENS with any available documents describing the quantity, nature, location and extent of such materials, contamination or conditions;

(g) Comply with all laws and provide any notices required to be given to any government authorities in connection with the Work, except such notices SIEMENS has expressly agreed in writing to give;

(h) Provide SIEMENS with legally required materials and information (including but not limited to Material Safety Data Sheets) related to all Hazardous Materials located at any Site where the Work is to be performed;

(i) Furnish to SIEMENS any contingency plans, safety programs and other policies, plans or programs related to any Site where the Work is to be performed;

(j) Operate, service and maintain all Equipment according to the manufacturer's recommendations including those set forth in the manufacturer's operating manuals or instructions, as well as all requirements of applicable law or of authorities having jurisdiction. The CLIENT shall furnish all needed servicing and parts for said FIMs, which parts shall become part of the FIMs. Such Equipment shall be operated only in the specified operating environment, which shall be supplied by CLIENT, including without limitation: (1) suitable electrical service, including clean, stable, properly conditioned power, to all Equipment; (2) telephone lines, capacity and connectivity as required by such Equipment; and (3) heat, light, air conditioning or other environmental controls, and other utilities in accordance with the specifications for the Equipment;

(k) Promptly notify SIEMENS of any unusual or materially changed operating conditions, hours of usage, system malfunctions, installed equipment or building alterations that may affect the Equipment or energy usage or any Services; and

(l) If applicable, provide and pay for a dedicated voice grade dial-up phone line and install a terminal block in a mutually agreed upon location. All on-line service Equipment (not including the phone line) will remain the property of SIEMENS unless otherwise stated herein.

6.2 CLIENT acknowledges that the technical and pricing information contained in this Agreement is confidential and proprietary to SIEMENS and agrees not to disclose it or otherwise make it available to others without SIEMENS express written consent.

6.3 CLIENT acknowledges that it is now and shall at all times remain in control of the project Site. Except as expressly provided herein, SIEMENS shall not be responsible for the adequacy of the health or safety programs or precautions related to CLIENT's activities or operations, CLIENT's other contractor, the work of any other person or entity, or Site conditions. SIEMENS shall not be responsible for inspecting, observing, reporting or correcting health or safety conditions or deficiencies of CLIENT or others at the Site. So as not to discourage SIEMENS from voluntarily addressing health or safety issues while at the Site, in the event SIEMENS does address such issues by making observations, reports, suggestions or otherwise, SIEMENS shall not be liable or responsible on account thereof.

Article 7

Changes and Delays

7.1 As the Work is performed, conditions may change or circumstances outside SIEMENS reasonable control (including changes of law) may develop which would require SIEMENS to expend additional costs, effort or time to complete the Work, in which case SIEMENS will notify CLIENT and an equitable adjustment will be made to SIEMENS compensation and the time for performance. In the event conditions or circumstances require the Work to be suspended or terminated, SIEMENS shall be compensated for Work previously performed and for costs reasonably incurred in connection with the suspension or termination.

7.2 Either party may request additions, deletions, modifications or changes to the Work. Any such requests shall only become effective upon execution of a written agreement by authorized representatives of both parties.

7.3 SIEMENS may, in its sole discretion, substitute alternative parts, goods or equipment in the performance of the Work, provided that any such substitution shall be of an equal or better quality.

7.4 SIEMENS shall not be responsible for loss, delay, injury, damage or failure of performance that may be caused by circumstances beyond its control, including but not restricted to acts or omissions by CLIENT or its employees, agents or contractors, Acts of God, war, civil commotion, acts or omissions of government authorities, fire, theft, corrosion, flood, water damage, lightning, freeze-ups, strikes, lockouts, differences with workmen, riots, explosions, quarantine restrictions, delays in transportation, or shortage of vehicles, fuel, labor or materials. In the event of such delay or failure, the time for performance shall be extended by a period equal to the time lost plus a reasonable recovery period and the compensation shall be equitably adjusted to compensate for additional costs SIEMENS incurs due to such delay. If any such delay exceeds sixty (60) days, SIEMENS may terminate this Agreement upon three (3) days notice to CLIENT and CLIENT shall promptly pay SIEMENS for the allocable portion of the Work completed and for any costs and expenses of termination and for any loss or damage incurred with respect to materials, equipment, tools and machinery, including reasonable overhead and profit.

Article 8

Compensation

8.1 Unless otherwise agreed in writing, SIEMENS shall be compensated for any extra work requested by CLIENT at its prevailing rates and shall be reimbursed for costs and expenses (plus reasonable profit and overhead) reasonably incurred in its performance of the Work or Services. The Contract Sum provides for, and is in consideration of, only the services specifically included under the Scope of Work and Services. All other Work and Services, including but not limited to the following, shall be separately billed or surcharged on a time and materials basis:

(a) Emergency Services performed at CLIENT's request, if inspection does not reveal any deficiency covered by the Scope of Work and/or Services;

(b) Work and/or Services performed at CLIENT's request at times other than during SIEMENS normal working hours; and

(c) Work and/or Services performed on equipment not covered by the Scope of Work and/or Services.

8.2 Unless otherwise agreed in writing, SIEMENS may invoice CLIENT on a monthly or other progress-billing basis. Invoices are due and payable upon receipt by CLIENT. If CLIENT disagrees with any portion of an invoice, it shall notify SIEMENS in writing of the amount in dispute and the reason for its disagreement within 21 days of receipt of the invoice, and shall pay the portion not in dispute.

8.3 SIEMENS may suspend or terminate the Work or Services at any time if payment is not received when due and shall be entitled to compensation for the Work or Services previously performed and for costs reasonably incurred in connection with the suspension or termination.

8.4 On amounts not paid within 30 days of invoice date, CLIENT shall pay interest from invoice date until payment is received at the lesser of 12% per annum or the maximum rate allowed by law. CLIENT shall reimburse SIEMENS for SIEMENS costs and expenses (including reasonable attorneys' and witnesses' fees) incurred for collection under this Agreement.

8.5 Except to the extent expressly agreed in writing, SIEMENS' fees do not include any taxes, excises, fees, duties or other government charges related to the Work or Services, and CLIENT shall pay such amounts or reimburse SIEMENS for any amounts it pays. If CLIENT claims that Work or Services is subject to a tax exemption or direct

payment permit, it shall provide SIEMENS with a valid exemption certificate or permit and indemnify, defend and hold SIEMENS harmless from any taxes, costs and penalties arising out of the use or acceptance of same.

Article 9

Acceptance

9.1 When SIEMENS believes that all, or an independent, definable phase or portion, of the Work is Substantially Complete, SIEMENS will submit a Certificate of Substantial or Final Completion to the CLIENT. If the described portion of the Work as performed is Substantially Complete as defined herein, the CLIENT will accept that Work by signing the Certificate of Substantial or Final Completion and returning it to SIEMENS. If the Work is not Substantially Complete, then the CLIENT Representative shall notify SIEMENS within five (5) business days of any discrepancies and SIEMENS shall correct the Work to conform to the description of the Work set forth herein and resubmit the Certificate of Substantial or Final Completion to the CLIENT if SIEMENS agrees with the notice of discrepancies or, if SIEMENS disagrees with the notice, notify CLIENT of its disagreement and such disagreement shall be resolved under the terms of this Agreement. If the CLIENT Representative does not deliver written notice to SIEMENS within five (5) business days of receiving the Certificate of Substantial or Final Completion, the CLIENT will be deemed to have agreed to, signed and returned the Certificate of Substantial or Final Completion. Any disputes concerning the completion or Substantial Completion of the Work will be resolved by submitting the issue to a third party professional engineering firm acceptable to both SIEMENS and the CLIENT. The determination of this firm with respect to completion or Substantial Completion will be final and binding upon the parties hereto. SIEMENS and the CLIENT shall share equally the costs or fees for such firm in connection with such dispute resolution process.

Article 10

Insurance and Allocation of Risk

10.1 SIEMENS shall maintain the following insurances while performing the Work:

(a) Workers' Compensation at the statutory amounts and limits as prescribed by applicable law.

(b) Employer's Liability insurance (and, where applicable, Stop Gap extended protection endorsement) limits of liability shall be:

- $1,000,000 per occurrence
- $1,000,000 Disease Policy
- $1,000,000 Each Employee

(c) SIEMENS shall carry, in the Occurrence Coverage Form, Comprehensive General Liability or Commercial General Liability, insurance covering SIEMENS' operations and providing insurance for bodily injury and property damage with limits of liability stated below and including coverage for:

- Products and Completed Operations
- Contractual Liability insuring the obligations assumed by SIEMENS in this Agreement
- Broad Form Property Damage (including Completed Operations)
- Explosion, Collapse and Underground Hazards
- Personal Injury Liability
  - Limits of liability shall be:
    - $1,000,000 per occurrence/aggregate

(d) SIEMENS shall carry Automobile Liability Insurance in the Occurrence Coverage Form covering all owned, hired and non-owned automobiles and trucks used by or on behalf of SIEMENS providing insurance for bodily injury liability and property damage liability for the limits of:

- $1,000,000 per occurrence/aggregate

(e) SIEMENS shall carry Excess Liability Insurance in the Occurrence Coverage Form with limits of:

- $5,000,000 per occurrence/aggregate

10.2 CLIENT will maintain, at its own expense, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus the value of subsequent modifications and cost of materials supplied or installed by others, on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by SIEMENS, until

final payment has been made to SIEMENS or no person or entity other then CLIENT has an insurable interest in the property, whichever is later. The policy form shall include without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and start-up, rebuilding and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for SIEMENS' services and expenses required as result of such insured loss. If the insurance requires deductibles or retentions, the CLIENT shall pay costs not covered because of such deductibles or retentions. This insurance shall cover portions of the work off the Site, and also portions of the work in transit. Partial occupancy or use shall not commence unless the insurance company providing this insurance has consented to such partial occupancy or use by endorsement for otherwise. The CLIENT shall purchase and maintain boiler and machinery insurance which shall specifically cover such insured objects during installation and until Acceptance by the CLIENT. The insurances required by this section shall include the interests of the CLIENT, SIEMENS, subcontractor and sub-subcontractor in the Work. SIEMENS shall be included as an additional insured on each such insurance coverage. The CLIENT and SIEMENS waive all rights against each other and any of their subcontractors, sub-subcontractors, agents and employees for damages caused by fire or other causes of loss to the extent covered by the insurance required by this section and for any other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the CLIENT as fiduciary. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. Insurance certificates shall be furnished upon request.

10.3 Risk of loss of materials and Equipment furnished by SIEMENS shall pass to CLIENT upon their delivery to the Site, and CLIENT shall be responsible for protecting and insuring them against theft and damage. However, until SIEMENS is paid in full, SIEMENS shall retain title for security purposes only and the right to repossess the materials and Equipment.

10.4 SIEMENS will indemnify CLIENT from and against losses, claims, expenses and damages (including reasonable attorney's fees) for personal injury or physical damage to property (collectively "Damages"). Such indemnification shall be solely to the extent the Damages are caused by or arise directly from SIEMENS or its employees, consultants' or agents' negligent acts or omissions or willful misconduct in connection with SIEMENS performance of the Work. SIEMENS obligations under this indemnity shall not extend to Damages arising out of or in any way attributable to the negligence of CLIENT or its agents, contractors or employees. SIEMENS reserves the right to control the defense and settlement of any claim for which SIEMENS has an obligation to indemnify hereunder. In no event shall CLIENT or SIEMENS be liable under this indemnity or otherwise under this Agreement for special, indirect, incidental, punitive, exemplary or consequential damages, including commercial loss, loss of use, or lost profits, however caused, even if SIEMENS or CLIENT have been advised of the possibility of such damages.

10.5 SIEMENS shall defend, indemnify and hold harmless CLIENT from and against any claim, suit, demand or action alleging that the use of the Work infringes a U.S. patent, copyright or trademark or misappropriates any trade secret or violates any other intellectual property rights of any third party; provided however, that:

(a) CLIENT shall give SIEMENS immediate written notice of such action and all prior claims relating thereto; and

(b) CLIENT shall fully cooperate with SIEMENS in the defense of such action and all negotiations for its settlement or compromise.

10.6 The parties acknowledge that the price for which SIEMENS has agreed to perform the Work and obligations under this Agreement was calculated based upon the foregoing allocations of risk, and that each party has expressly relied on, and would not have entered into this Agreement but for, such allocations of risk.

Article 11

Hazardous Materials Provisions

11.1 The Work does not include directly or indirectly performing or arranging for the detection, testing, handling, storage, removal, treatment, transportation, disposal, monitoring, abatement or remediation of any contamination of any Site at which Work is performed and any soil or groundwater at the Site by petroleum or petroleum products (collectively called "Oil"), asbestos, PCBs or hazardous, toxic, radioactive or infectious substances, including any substances regulated under RCRA, CERCLA or any other federal, state or local environmental laws, regulations, statutes, rules, standards or ordinances (collectively called "Hazardous Materials"), including without limitation ionization smoke

detectors, ballasts, mercury bulb thermostats, used oil, contaminated filters, contaminated absorbents, and refrigerant. Except as expressly disclosed pursuant to Section 11.2, CLIENT represents and warrants that there are no Hazardous Materials or Oil, present at CLIENT's locations where the Work is to be performed. SIEMENS will notify CLIENT immediately if it discovers or reasonably suspects the presence of any previously undisclosed Oil or Hazardous Material. All Services have been priced and agreed to by SIEMENS in reliance on CLIENT's representations as set forth in Article 11. The discovery or reasonable suspicion of Hazardous Materials or hazardous conditions at a Site where SIEMENS is to perform Work or of contamination of the Site by Oil or Hazardous Materials not previously disclosed pursuant to Section 11.2 shall entitle SIEMENS to suspend the Work immediately, subject to mutual agreement of terms and conditions applicable to any further Work, or to terminate the Work and to be paid for Work previously performed.

11.2 CLIENT warrants that, prior to the execution of the Agreement, it notified SIEMENS in writing of any and all Oil or Hazardous Materials present, potentially present or likely to become present at the Site and provided a copy of any Site safety policies and information, including but not limited to lock-out and tag procedures, chemical hygiene plan, material safety data sheets, and other items covered or required to be disclosed or maintained by federal, state, or local laws, regulations or ordinances.

11.3 Regardless of whether or not the Oil or Hazardous Material was disclosed pursuant to Section 11.2, CLIENT shall be solely responsible for properly testing, abating, encapsulating, removing, disposing, remedying or neutralizing such Oil or Hazardous Materials, and for the costs thereof. Even if an appropriate change order has been entered into pursuant to Section 11.1, SIEMENS shall have the right to stop the Work until the Site is free from Oil or Hazardous Materials. In such event, SIEMENS will receive an equitable extension of time to complete the Work, and compensation for delays caused by Oil or Hazardous Materials remediation. In no event shall SIEMENS be required or construed to take title, ownership or responsibility for such Oil or Hazardous Materials. CLIENT shall sign any required waste manifests in conformance with all government regulations, listing CLIENT as the generator of the waste. If someone other than CLIENT is the generator of the waste, CLIENT shall arrange for such other person to sign such manifests.

11.4 For separate consideration of $10 and other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, CLIENT shall indemnify, defend and hold SIEMENS harmless from and against any damages, losses, costs, liabilities or expenses (including attorneys' fees) arising out of any Oil or Hazardous Materials or from CLIENT's breach of, or failure to perform its obligations under, Sections 11.1, 11.2 or 11.3.

Article 12

Miscellaneous Provisions

12.1 Notices between the parties shall be in writing and shall be hand delivered or sent by certified mail, express courier, or acknowledged telefax properly addressed to the appropriate party. Any such notice shall be deemed to have been received when delivered in person or when sent by telefax, or five (5) business days subsequent to deposit in the U.S. mails, or one (1) day after deposit with express courier.

12.2 Neither CLIENT nor SIEMENS shall assign or transfer any rights or obligations under this Agreement, except that either party may assign this Agreement to its affiliates and SIEMENS may use subcontractors in the performance of the Work. Nothing contained in this Agreement shall be construed to give any rights or benefits to anyone other than CLIENT and SIEMENS without the express written consent of both parties.

12.3 This Agreement shall be governed by and construed in accordance with the laws of the state or commonwealth within which the Facilities are located.

12.4 This Agreement and all provisions of this Agreement allocating responsibility or liability between the parties shall survive the completion of the Work and the termination of this Agreement.

12.5 SIEMENS performance of the Work is expressly conditioned on CLIENT's assenting to all of the terms of this Agreement, notwithstanding any different or additional terms contained in any writing at any time submitted or to be submitted to SIEMENS by CLIENT relating to the Work, even if signed by SIEMENS, unless SIEMENS signs a written statement expressly indicating that such terms supersede the terms of this Agreement

12.6 Any provision of this Agreement found to be invalid, unlawful or unenforceable by a court of law shall be ineffective to the extent of such invalidity, and deemed severed herefrom, without invalidating the remainder of this Agreement. All other provisions hereof shall remain in full force and effect.

12.7 The waiver by a party of any breach by the other party of any term, covenant or condition hereof shall not operate as a waiver of any subsequent breach hereof. No waiver shall operate or be effective unless made in writing and executed by the party to be bound thereby.

Article 13

Maintenance Services Technical Support Program

13.1 The scope of services provided by SIEMENS for the Maintenance Services Technical Support Program (MSTSP) is stated in Exhibit A, Article 4.

13.2 The CLIENT represents that all equipment not installed by SIEMENS under this Agreement and subject to a MSTSP is in satisfactory working condition. SIEMENS will have inspected all such equipment within the first thirty (30) days of MSTSP commencement or no later than the first scheduled inspection. Testing and inspection will not be deemed to be complete until all such equipment has been so tested and inspected.

13.3 If the equipment is altered or moved by any person, including CLIENT, other than SIEMENS or a person authorized by SIEMENS, CLIENT shall immediately notify SIEMENS in writing, and SIEMENS reserves the right to perform a reacceptance test on, or if necessary a re-commissioning of, the system at CLIENT's expense.

13.4 If SIEMENS reasonably determines as a result of such inspection and/or testing that any equipment requires repair or replacement, the CLIENT will be so notified and shall take corrective action within thirty (30) days, or such equipment shall be removed from coverage hereunder without further action by the parties. SIEMENS is not liable or responsible for the continued testing, maintenance, repair, replacement or operating capabilities of any portion of the equipment until it has been inspected and/or tested and has been, if necessary, restored to an acceptable initial condition at CLIENT's sole expense. Any services provided by SIEMENS in the course of such restoration will be separately charged, on a time and materials basis, and not included in fees paid hereunder. If individual items of equipment cannot, in SIEMENS sole determination, be properly repaired or replaced due to age, obsolescence, lack of availability of refrigerant gas, halon gas, necessary parts, materials, compatibility or otherwise, or as a result of excessive wear or deterioration, SIEMENS may, within ten (10) days of such inspection, give written notice that it is withdrawing such items from coverage under the MSTSP and adjust the MSTSP Payments due hereunder accordingly.

13.5 If the removal of equipment from coverage would compromise or impair the integrity of the Work, Services or compliance with law of any system, then SIEMENS will provide a written statement thereof for execution by CLIENT. CLIENT's failure to execute such statement within ten (10) days will void the MSTSP and release SIEMENS from any further obligations with respect to the MSTSP.

13.6 If the MSTSP scope of Services defined is this Agreement, Exhibit A, Article 4 provide for equipment maintenance, repairs and/or replacements of equipment by SIEMENS, those Services are limited to restoring the proper working condition of such equipment. SIEMENS will not be obligated to provide replacement equipment that represents significant capital improvement compared to the original. Exchanged components become the property of SIEMENS, except Hazardous Materials, which under all circumstances remain the property and responsibility of CLIENT.

Article 1: Scope of FIM Work

1.1 *Description*: Except as otherwise expressly provided herein, SIEMENS shall provide each and every item of cost and expense necessary for this Performance Contracting Agreement.

1.2 *Specific Elements*: The Work shall include the following:

1.2.1 The installation of a new Building Automation System (BAS) as described in Exhibit D (Technical Audit).

1.2.2 The installation of two (2) new Chillers as described in Exhibit D (Technical Audit).

1.2.3 The Installation of two (2) new Cooling Towers and associated variable frequency drives as described in Exhibit D (Technical Audit).

1.2.4 The retrofit of the existing lighting system and select lighting controls as described in detail in Exhibit D (Technical Audit).

1.2.5 The installation of four (4) new pump motors as described in detail in Exhibit D (Technical Audit).

1.2.6 The provision of and installation of two (2) new meters for Cooling Tower blowdown and fill for evaporization.

1.3 **Technical Specifications, Drawings, and Exhibits:** The Work shall be performed in accordance with the following specifications, drawings and other attachments hereto, which are specifically incorporated herein and made part hereof:

1.3.1 This project scope includes the provision of submittals and as-built drawings of the project installation segments as listed above. This includes the provision of the submittals and manuals on CD's for record keeping purposes. The project cost does not include a provision of CAD drawings of the floor layouts and the building design. The prints that exist do not have CAD duplicates and cannot be duplicated without in depth engineering time and cost.

1.4 **The City of Gainesville's Responsibility:** As discussed during the review of the project scope CLIENT has agreed to assist SIEMENS with the following items:

1.4.1 Provide full access to the facility during normal working hours and after hours where required. This also means the ability to provide building access around the facility for crane purposes and for the normal course of actions required to finish the installation.

1.4.2 Provide assistance in the possible replacement or repair of certain items in the facility that may be diagnosed as not functional during the installation of the above items. These items include exhaust fans, chilled water and heating valves and the possible repair and or replacement of dampers that may be malfunctioning.

1.4.3 Provide either through SIEMENS (under separate contract) or through CLIENT, the cleaning and continued maintenance of the mechanical systems in the facility. The current mechanical systems such as cooling and heating coils need to be cleaned and will affect the efficiencies of the equipment.

Article 2: FIM Work Implementation Period

2.1 Commencement of Work and Milestones:

2.1.1 SIEMENS shall commence the Work on March 1st or within (1) week of the Effective Contract Date, and shall perform the Work diligently and shall complete the Work no later than 08/31/2006. The final completion date may need to be flexible due to equipment delivery dates of the chillers, towers and boiler. The intent is to perform the lighting portion of the project during the first thirty days. In conjunction with the lighting project, the design of the BAS system will commence and during the first 60 days of the contract period the control system will be installed less the chillers, boilers and towers. The chillers boilers and towers will take approximately 10 to 12 weeks to be shipped and on site. The installation of the chillers towers and boiler will commence and complete on successive weeks shortly after delivery. The pump motors and GRU provided meters will be installed towards the completion of the project. Immediately following the installation of all equipment and controls a commissioning period will commence on the installation of the devices and specifically on the programming of all devices and sequence of operation. Finally, a computer workstation will be located at CLIENT's facility and will be programmed with color graphics, intranet software (Apogee Go) and RENO (remote annunciation software).

Article 3: Scope of Performance Assurance Technical Support Program

3.1 A reconciliation of savings shall be performed on an annual basis. SIEMENS will perform the annual reconciliation as a part of the Performance Assurance Technical Support Program (TSP). Please refer to Exhibit D (Technical Audit) and Exhibit C for the scope of the Measurement and Verification Program included as a part of the Performance Assurance TSP.

Article 4: Scope of Maintenance Services Technical Support Program

4.1 There are no ongoing Maintenance Services provided under this Agreement. Please refer to the Technical Support Program options outside of the contract.

This Exhibit is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT:		**SIEMENS:**	
Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

Article 1: Payment for Scope of FIM Work

1.1 **Price:** As full consideration of the Work as described in Exhibit A, Article 1: Scope of FIM Work, the CLIENT shall pay to SIEMENS the Contract Sum of $ 942,136.00 (not including any applicable taxes).

1.2 **Escrow:** The CLIENT has agreed to deposit the Contract Sum in an Escrow Account at a financial institution satisfactory to both the CLIENT and SIEMENS. Exhibit F (Siemens Financial Services Agreement) contains additional details of the financial agreement including escrow account details. Refer to Exhibit F for those details. All interest income and expenses to establish the Escrow Account shall be the complete responsibility of the CLIENT and the CLIENT will receive all interest earnings from the Escrow Account. SIEMENS will submit periodic invoices to the CLIENT based on the following Payment Schedule in Table B.1 below. The CLIENT shall be responsible for submitting the necessary documentation to the Escrow Agent for timely withdraws from the Escrow Account. The funding of the Escrow Account in an amount equal to or greater than the Price stated in Article 1.1 above shall be a condition precedent to SIEMENS obligation to perform or to continue the performance of the Work. If the Escrow Account is not funded within 30 days from the execution of this Agreement, this Agreement shall be null and void. This 30 day funding period may be extended as mutually agreed upon in writing by both parties. In the event that the Agreement becomes null and void as described in this paragraph and CLIENT has authorized SIEMENS to proceed with Work, CLIENT shall be obligated to reimburse SIEMENS: (i) for the Work performed to date; or (ii) as specified in CLIENT's authorization to proceed with Work.

1.3 **Timely Payments:** The CLIENT agrees to pay Siemens per Table B.1 below. CLIENT agrees to pay all invoices submitted by SIEMENS per Agreement, Article 8.

Table B.1 – FIM Work Payment Schedule

Project Phase	Payments ($)	Payments (%)	Schedule
Engineering and Mobilization	$90, 000.00	10%	03/01/2006
Equipment Ordering	$339,200.00	36%	03/31/2006
Progress Payment #1	$150,741.00	16%	05/15/2006
Progress Payment #2	$150,741.00	16%	06/15/2006
Final Payment	$150,741.00	16%	07/15/2006
Retainage	$60,713.00	6%	08/31/2006
PROJECT TOTAL:	$942,136.00	100%	

Article 2: Payment for Performance Assurance Technical Support Program (PATSP)

2.1 **Price:** As full consideration of the Services as described in Exhibit A, Article 3, the CLIENT shall pay to SIEMENS the Annual Contract Sum of $ 11,144 (plus applicable taxes) as escalated in Table B.2 below.

2.2 **Performance Assurance Services Term:** The Term of the PATSP shall be 12 months and shall commence on Guarantee Date.

2.3 **Automatic Renewal:** The PATSP shall automatically renew for successive Annual Periods beginning on the anniversary date of Guarantee Date. Either party may amend the PATSP at the end of the initial term or at the end of a renewal term by giving the other party at least sixty (60) days prior written notice of such amendments. Each renewal shall be and

remain subject to the terms and conditions of this Agreement. The Performance Guarantee is dependent upon and is subject to the express condition that the CLIENT enters into and maintains PATSP, during the entire term of the Performance Guarantee Period.

2.4 **Termination**: See Article 4 of the Agreement.

Table B.2 – Performance Assurance Technical Support Program Payment Schedule

Date	Quarterly Payments ($)	Notes
Guarantee Date (estimated 09/01/06) also known as the beginning of Year 1	**$ 2, 786.00**	**$ 11, 144.00 (total amount of payments in Year 1 with first quarterly payment due on the Guarantee Date)**
12 months from Guarantee Date (estimated 09/01/2007) also known as the beginning of Year 2	**$ 2, 786.00**	**$ 11, 144.00 (total amount of payments in Year 2)**
24 months from Guarantee Date (estimated 09/01/2008) also known as the beginning of Year 3	**$ 2, 786.00**	**$ 11, 144.00 (total amount of payments in Year 3)**
48 months from Guarantee Date (estimated 09/01/2009) also known as the beginning of Year 4	**$ 2, 856.00**	**$ 11, 424.00 (total amount of payments in Year 4)**
60 months from Guarantee Date (estimated 09/01/2010) also known as the beginning of Year 5	**$ 2, 927.00**	**$ 11, 708.00 (total amount of payments in Year 5)**
72 months from Guarantee Date (estimated 09/01/2011) also known as the beginning of Year 6	**$ 3, 000.00**	**$ 12, 000.00 (total amount of payments in Year 6)**

84 months from Guarantee Date (estimated 09/01/2012) also known as the beginning of Year 7	**$ 3, 076.00**	**$ 12, 304.00 (total amount of payments in Year 7)**
96 months from Guarantee Date (estimated 09/01/2013) also known as the beginning of Year 8	**$ 3, 152.00**	**$ 12, 608.00 (total amount of payments in Year 8)**
108 months from Guarantee Date (estimated 09/01/2014) also known as the beginning of Year 9	**$ 3, 230.00**	**$ 12, 920.00 (total amount of payments in Year 9)**
120 months from Guarantee Date (estimated 09/01/2015) also known as the beginning of Year 10	**$ 3, 312.00**	**$ 13, 248.00 (total amount of payments in Year 10)**
132 months from Guarantee Date (estimated 09/01/2014) also known as the beginning of Year 11	**$ 3, 394.50**	**$ 13,578.00 (total amount of payments in Year 11)**
144 months from Guarantee Date (estimated 09/01/2015) also known as the beginning of Year 12	**$ 3, 479.25**	**$ 13, 917.00 (total amount of payments in Year 12)**

Article 3: Payment for Maintenance Services Technical Support Program

3.1 **There are no ongoing Maintenance Services provided under this Agreement.**

This Exhibit is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT:		**SIEMENS:**	
Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

Article 1: Summary of Articles and Total Guaranteed Savings

The following Articles and Table are attached and made part of this Exhibit C:

Article 1	Summary of Articles and Total Guaranteed Savings
Article 2	Guarantee Savings Types
Article 3	Guarantee Term Responsibilities of CLIENT
Article 4	Measurement and Verification Plan
Article 5	Baseline Data
Article 6	Utility Rate Structures and Escalation Rates
Article 7	Contracted Baseline Data

Table 1.1 – Total Guaranteed Savings

Year	Energy/Utility Savings	Operational Savings	Total Savings
Year 1	**$98,649**	**$14,000**	**$112,649**
Year 2	**$99,635**	**$13,000**	**$112,635**
Year 3	**$100,632**	**$12,000**	**$112,632**
Year 4	**$101,638**	**$11,500**	**$113,138**
Year 5	**$102,654**	**$11,000**	**$113,654**
Year 6	**$103,681**	**$10,000**	**$113,681**
Year 7	**$104,718**	**$9,000**	**$113,718**
Year 8	**$105,765**	**$9,500**	**$115,265**
Year 9	**$106,822**	**$8,000**	**$114,822**
Year 10	**$107,891**	**$7,000**	**$114,891**
Year 11	**$108,970**	**$6,000**	**$114,970**
Year 12	**$110,059**	**$5,500**	**$115,559**

Article 2: Guaranteed Savings Types

2.1 Guarantee Types. There are four guarantee options to measure and verify savings: Option A - Measured Capacity, Option B - Measured Consumption, Option C - Main Meter Comparison, and Option D - Stipulated.

a. Option A - Measured Capacity. This approach is intended for Facility Improvement Measures where a one-time measurement for specific equipment or systems instantaneous baseline energy use, and a one-time measurement for specific equipment or systems instantaneous post-implementation (Post) energy use can be measured. Baseline and Post energy consumption is calculated by multiplying the measured end use instantaneous capacity (i.e. – kW, Gal/hr, BTU/hr) by stipulated hours of operation for each mode of operation (i.e. – hours, week, month). The calculations for energy consumption will be defined in the Measurement and Verification article of this Exhibit C. The work sequence required for data

collection, evaluation, and reporting will be defined in the Measurement and Verification article of this Exhibit A.

b. Option B - Measured Consumption. This approach is intended for Facility Improvement Measures where continuous periodic measurements for specific equipment or systems baseline energy use, and continuous periodic measurements for that equipment or systems post-implementation (Post) energy use can be measured. The calculations for energy consumption will be defined in the Measurement and Verification article of this Exhibit C. Periodic inspections and consumption measurements of the equipment or systems will be necessary to verify the on-going efficient operation of the equipment and saving attainment. The predetermined schedule for data collection, evaluation, and reporting will be defined in the Performance Assurance Technical Support Program article of this Exhibit A.

c. Option C - Main Meter Comparison. This approach is intended for measurements of the whole-facility or specific meter baseline energy use, and measurements of whole-facility or specific meter post-implementation (Post) energy use can be measured. The methodology to establish baseline and Post parameter identification, modeling approach and baseline or model adjustments will be defined in the Measurement and Verification article of this Exhibit C. Periodic inspections of baseline energy usage, operating practices, and facility and equipment, and meter measurements of the will be necessary to verify the on-going efficient operation of the equipment, systems, practices and facility, and saving attainment. The predetermined schedule for data collection, evaluation, and reporting will be defined in the Performance Assurance Technical Support Program article of this Exhibit A.

d. Option D - Stipulated. This approach is intended for Facility Improvement Measures where the end use capacity or operational efficiency; demand, energy consumption or power level; or manufacturer's measurements, industry standard efficiencies or operating hours are known in advance, and used in a calculation or analysis method that will stipulate the outcome. Both CLIENT and SIEMENS agree to the stipulated inputs and outcome(s) of the analysis methodology. Based on the established analytical methodology the savings stipulated will be achieved upon completion of the Facility Improvement Measures Work and that no further measurements or calculations will need to be performed. The methodology and calculations to establish savings value will be defined in the Measurement and Verification article of this Exhibit C.

2.2 Table 2.2 below summarizes the first year savings of the Total Guaranteed Savings (Article 1, Table 1.1) in Guarantee Type categories.

Table 2.2 – Energy and Operational Savings Details by Guarantee Type

	Energy or Utility Saving $					Operational Savings $		
	Guarantee Type Options					Guarantee Types		
FIM	**A** Measured Capacity	**B** Measured Consumption	**C** Main Meter Comparison	**D** Stipulated	Total	**B** Measured [1]	**D** Stipulated [2]	Total
Lighting Retrofit	0	0	$37,760	0	$37,760	0	$2,000	$2,000
Boiler Replacement	0	0	$3,062	0	$3,062	0	$3,200	$3,200
Boiler Controls	0	0	$4,449	0	$4,449	0	0	0
Chiller Replacement	0	0	$11,128	0	$11,128	0	$5,900	$5,900
Cooling Tower Metering	0	$3,755	0	0	$3,755	0	$2,100	$2,100
EMS System Upgrades	0	0	$29,448	0	$29,448	0	$800	$800
Cooling Towers with VFDs	0	0	$6,901	0	$6,901	0	0	0
High Efficient Motors	0	0	$2,146	0	$2,146	0	0	0

[1] Operational savings are detailed in Exhibit C, Article 4.5

[2] Operational savings identified by the CLIENT are detailed in Table 2.3.

2.3 Table 2.3 identifies the source of Operational Savings defined by the CLIENT. These savings shall not be measured or monitored during the guarantee term. Neither the CLIENT nor SIEMENS will have any right to object to use of such amounts as the Stipulated Savings in the calculation of Annual Realized Savings.

Table 2.3 - Source of Operational Savings

Account/'Vendor	Description	Annual Cost $	# of Annual Periods Savings Are Applied	First Year Annual Savings Allowed
Various Vendors	Lighting Supplies (lamps, ballasts)	$2,000	2	$2,000
Various Vendors	HVAC System Repairs	$11,200	12	$11,200
Various Vendors	EMS System Repairs	$1,900	12	$1,900

Article 3: Guarantee Term Responsibilities of the CLIENT.

This Article details the individual agreed to responsibilities of SIEMENS and the CLIENT, in connection with the management and administration of the Performance Guarantee.

3.1 The CLIENT will provide a representative at Gainesville Police Department facility to coordinate work and provide required data described below.

3.2 The CLIENT will provide SIEMENS with accurate facility operating information as defined below and in the Contracted Baseline article of this Exhibit C during each Annual Period, as soon as such information becomes available to the CLIENT.
(a) Facility Occupancy Data and Usage
(b) Changes in Operating Schedules
(c) Major Additions or Deletions of Equipment

3.3 CLIENT will provide SIEMENS with copies of utility bills within 30 days of receipt by CLIENT or provide access to utility vendor information.
(a) Monthly Electricity Bills
(b) Monthly Natural Gas Bills
(c) Monthly Water and Wastewater Bills

3.4 CLIENT will provide telephone/data remote access, through SIEMENS Insight® or Apogee® software package or otherwise, as SIEMENS reasonably requests. All charges related to telephone/data line installation, activation and communication services are the responsibility of the CLIENT.

Article 4: Measurement and Verification Plan

The following information outlines are applicable for this contract:
Article 4.1 Measurement and Verification (M&V) methods provided under this Article.
Article 4.2 Option A - Measured Capacity
Article 4.3 Option B - Measured Consumption
Article 4.4 Option C - Main Meter Comparison
Article 4.5 Option D - Stipulated

4.1 **General Overview –**

(a) The purpose of the Measurement and Verification (M&V) article is to identify the methods, measurements, procedures and tools that will be used to verify the savings for each FIM. Savings were determined by comparing prior usage, consumption or efficiencies defined as the Baseline to the selected FIMs being implemented against the post FIM implementation usage, consumption or efficiencies. The Baseline usage, consumption or efficiencies is described in this Exhibit C, Article 5. The usage, consumption or efficiencies associated with the FIM implementation is defined as the Contracted Baseline, and are described in this Exhibit C, Article 7.
(b) The actual guaranteed savings associated with this contract are outlined in this Exhibit C, Article 1 - Table 1.1 and Article 2 – Table 2.1 of this contract.

4.2 **Option A - Measured Capacity**

4.2.1 There are no FIMS that will be utilizing Option A for M&V.

4.3 **Option B - Measured Consumption**

4.3.1 Cooling Tower Metering

Description: In this FIM, the addition of water consumption metering at the make-up water supply and blow-down water exit of the Cooling Towers will enable the local utility, Gainesville Regional Utilities (GRU), to avoid applying wastewater charges to the water consumed in the evaporation process of the Cooling Towers.

Calculations: Currently, with the lack of the appropriate metering, the utility is applying wastewater charges to all water usage at the facility. Therefore, the addition of the meters will result in a measured quantity of water to which wastewater charges will not apply and thus a reduction in the costs associated with wastewater. There are no calculations that are applicable to this FIM as the results will be directly measured with metering. The calculations included in the Technical Audit are meant to estimate or forecast the savings attributed to this FIM. The total amount of that forecast is included in the guarantee.

Responsibility for SIEMENS and CLIENT: SIEMENS will include in the annual reconciliation a summary of all credits that the utility has applied to the wastewater charges which are applicable to this FIM. All of those credits will be applied to the total realized savings. Any charges from the utility for the initial installation of the meters will also be included in the annual reconciliation.

CLIENT will ensure that the local utility has access to the meters for the purposes of reading the meters. CLIENT will also ensure that the utility maintains the installed metering.

Specifications on Measurement Tools: The utility will provide the appropriate metering and SIEMENS will install those meters.

4.4 **Option C - Main Meter Comparison**

4.4.1 General. Except as otherwise provided, energy savings will be calculated for each month of each Annual Savings Period as the product of (a) “units of energy saved” (kWh, Therms, GJ, etc.) multiplied by (b) “cost of energy”.

(a) Units of energy saved are computed by the “Metrix” software application. “Metrix” is an accounting software application copyrighted by SRC Systems, Inc. Units of energy saved are calculated by subtracting current period measured units of energy consumed from the adjusted Baseline units of energy defined in Article 5. Adjustments to the Baseline energy units are based on factors such as weather, occupancy, operating hours, etc., and changes to the Contracted Baseline conditions and operating practices as defined in Article 7).

(b) Costs of energy are defined in Article 6, Utility Rate Structures and Escalation Rates.

4.4.2 Sources of Data. For each month of the base year and each month of the term of the contract, data shall be obtained as follows:

(a) Weather - weather data shall be obtained from the National Weather Service, NOAA or Accuweather for the nearest weather station to the Facility.

(b) Energy Use -

1. Electricity usage data shall be obtained from the electric utility bills. Since meters are not usually read on the same day each month, monthly usage shall be determined by apportioning billed usage assuming a constant daily usage between meter readings. Usage for most months will, therefore, be derived from two bills. Before the start of the contract, the parties will agree which bill to consider predominant, i.e. to classify as the "month" by name only.
2. Utility rates and costs used for savings calculations are outlined in Exhibit C, Article 6, Utility Rate Structures.
3. Natural gas, oil, purchased steam, water and other purchased utilities usage's shall be determined by the method described above for electricity.

4.4.3 Metrix Calculations. The Tuning Period's utility data and weather parameters will be entered into Metrix or calculated using a substantially similar algorithm. Metrix will adjust the Tuning Period Data based on weather and operational conditions during the Annual Savings Period to estimate the energy and energy costs of the Facility had SIEMENS not performed the Work (the "Baseline"). SIEMENS will adjust energy savings for variations in energy consumption due to

(a) Local weather conditions.
(c) Occupancy level changes, hours of operation,
(d) Structural modifications, modifications to energy consuming equipment,
(e) Damaged or malfunctioning equipment, and
(f) Any variances from the proposed operating schedules, strategies and conditions upon which the calculated savings are based on, and described in the Exhibit C, Article 7, "Contracted Baseline" that could affect energy usage.

There may be changes in the Facility's usage and operation for which a calculated adjustment is necessary. Either the CLIENT or SIEMENS may propose an adjustment procedure based upon acceptable engineering practices to account for any such changes.

The Baseline for each month of the Annual Savings Period for each energy type (excluding kW demand adjustments) will be calculated as follows:

$$BL = B \times (T_i - T_{i-1}) + C_H \times HDD_{BH,I} + C_c \times CDD_{BC,I} + C_1 \times U_{1,I} + C_2 \times U_{2,I} + C_3 \times U_{3,i}$$

where:

BL	=	Baseline (Utility Units)
B	=	Baseload consumption per unit time (Utility Units/day)
$T_i - T_{i-1}$	=	time interval between date T_i and T_{i-1} (days)
C_H, C_C	=	Coefficients for Heating and Cooling Degree-days (Utility units/ deg-day)

$HDD_{BH,I}$ = Time history of Heating degree-days (°F-day or °C-day)
$CDD_{BC,I}$ = Time history of Cooling degree-days (°F-day or °C-day)
BH, BC = Heating and Cooling degree-day base temperatures (°F-day or °C-day)
C_1, C_2, C_3 = Coefficients for user variables 1,2,3 (e.g. occupancy/schedule, space utilization, added load)
$U_{1,I}$, $U_{2,I}$, $U_{3,I}$ = Coefficients for user variables 1,2,3

The Baseline for each month of the Annual Savings Period for each energy type for kW demand adjustments will be calculated as follows:

$$D_{BI} = B + C_H \times HDD_{BH,I} + C_c \times CDD_{BC,I} + C_1 \times U_{1,I} + C_2 \times U_{2,I} + C_3 \times U_{3,i}$$

where:
B = Baseload consumption per unit time (Utility Units/day)
$T_i - T_{i-1}$ = time interval between date T_i and T_{i-1} (days)
C_H, C_C= Coefficients for Heating and Cooling Degree-days (Utility units/ deg-day)
$HDD_{BH,I}$ = Time history of Heating degree-days (°F-day or °C-day)
$CDD_{BC,I}$ = Time history of Cooling degree-days (°F-day or °C-day)
BH, BC = Heating and Cooling degree-day base temperatures (°F-day or °C-day)
C_1, C_2, C_3 = Coefficients for user variables 1,2,3 (e.g. occupancy/schedule, space utilization, added load)
$U_{1,I}$, $U_{2,I}$, $U_{3,I}$ = Coefficients for user variables 1,2,3

Monthly energy savings will be calculated as follows:

$$ES = BL - AU \quad \text{and} \quad DS = D_{BI} - D_p$$

where:

ES = monthly unit energy savings
BL = Baseline
AU = post retrofit monthly energy usage
D_{BI} = adjusted demand
DS = kW demand savings
D_p = post retrofit kW demand usage

The energy costs avoided will be calculated as follows:

$$CS = ((DS \times dr) - Adc) + ((ES \times uc) - Aec) + Os$$

where:
CS = monetary savings
ur = The greater of the floor price of demand (as defined above) and the current costs
uc = the greater of the floor price of energy (as defined above) and the current costs, calculated as follows:
For energy sources the cost of which decreases with increasing usage, the marginal unit cost from the month's bill. For electricity, this marginal cost shall be determined for energy (starting with the amount paid for the last kilowatt-hour

purchased including fuel adjustment cost) and demand (amount paid for the last kilowatt purchased) including, if applicable, the effect of demand on the energy cost.

For energy sources the cost of which does not decrease with increasing usage, the average unit cost of all deliveries received during the month.
Adc = Actual current year demand costs from utility bill
Aec = Actual current year energy cost from utility bill (including taxes and fuel charges).
Os = Other related savings attributable to the conservation program.

If the Work results in a change of energy source (e.g. conversion from electric to gas heat), or where the level of usage changes enough to affect the marginal cost, or where utilities have changed rate structures, SIEMENS shall modify the calculations procedure to appropriately adjust for the change.

If a rate structure change eliminates a component of the bill previously charged for (e.g. kW, kVAR, transportation or Power Factor,) then the elimination of that charge will be calculated as a savings and added to the monetary savings.

4.5 **Option D – Stipulated**

Article 5: Baseline Data

5.1 The annual period(s) selected as the Baseline period starts on 09/06/2003 and ends on 08/07/2004. Table 5.1 outlines the utility consumption that occurred during this Baseline period. This Baseline facility utility consumption will be used as the reference that future years utility usage will be compared to in order to determination the Guaranteed Savings. Only electricity and natural gas consumption data is necessary to be described in the utility baseline as any other energy sources (fuel oil, water, wastewater, etc) will not use a baseline period to generate the savings (if any).

Table 5.1 – Baseline Utility Consumption

	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Electric	kWh	165,520	165,360	153,320	191,400	197,920	223,040	204,680	211,760	177,240	199.080	166,760	152,280
Electric	kW	296	241	311	355	380	343	333	322	317	229	283	258
N. Gas	Therm	3,936	3,644	3,276	3,085	2,766	2,988	2,642	3,108	3,035	3,761	4,139	3,864

5.2 The operating practices during the Baseline period determine the utility consumption shown in Table 5.1. The following data of this article outline the operating characteristics that were in effect during the Baseline period. The Guaranteed Savings provided under this Agreement are based on the efficiencies gained by implementing the FIM Work and implementing specific configuration of operating practices defined as the Contracted Baseline in Article 7 of this Exhibit C.

Table 5.2.1 Summer/Winter Operating Hours

Day of Week	On Peak Run Hours	Off Peak Run Hours		
Monday	10/10	14/14		
Tuesday	10/10	14/14		
Wednesday	10/10	14/14		
Thursday	10/10	14/14		
Friday	10/10	14/14		
Saturday	0/0	24/24		
Sunday	0/0	24/24		
Holiday	0/0	24/24		

Table 5.2.2 Summer/Winter Operating Temperatures

Day of Week	On Peak Minimum DEG	On Peak Maximum DEG	Off Peak Minimum DEG	Off Peak Maximum DEG
Monday	74/72	74/72	74/72	74/72
Tuesday	74/72	74/72	74/72	74/72
Wednesday	74/72	74/72	74/72	74/72
Thursday	74/72	74/72	74/72	74/72
Friday	74/72	74/72	74/72	74/72
Saturday	74/72	74/72	74/72	74/72
Sunday	74/72	74/72	74/72	74/72
Holiday	74/72	74/72	74/72	74/72

Table 5.2.3 Occupancy Summer/Winter

Day of Week	Day	Afternoon	Night	
Monday	80%/80%	60%/60%	20%/20%	
Tuesday	80%/80%	60%/60%	20%/20%	
Wednesday	80%/80%	60%/60%	20%/20%	
Thursday	80%/80%	60%/60%	20%/20%	
Friday	80%/80%	60%/60%	20%/20%	
Saturday	50%/50%	30%/30%	10%/10%	
Sunday	50%/50%	30%/30%	10%/10%	
Holiday	30%/30%	20%/20%	10%/10%	

5.3 Applicable codes - Federal, State, County or Municipal codes or regulations are applicable to the use and operation of the facility. SIEMENS will maintain the current level of facility compliance relative to applicable codes.

5.4 Building Inventory – Exhibit D (Technical Audit) outlines the equipment inventory's that exist in the facility during the Baseline period.

Article 6: Utility Rate Structures and Escalation Rates

6.1 Utility costs used for savings calculations will be based on the utility rate in effect for the predominant bill or the utility rate in effect for the corresponding period of the Baseline period, whichever is greater. The rate in effect during the Baseline period will be designated the floor price, and is shown below for each utility. An escalation rate (noted below for each utility) per annual period will be applied to the floor rates. The escalated floor rate will be compared to the utility rate in effect in each future annual period and the greater of the two will be applied to the actual utility savings occurring in that annual period.

Table 6.1.1 Electricity

Tariff Number or Designation:	General Service, Demand (GSD)	
Utility Name:	Gainesville Regional Utility	
Rate Structure:	$0.065	$ per kWh
	$6.33	$ per kW
Rate Escalation:	1%	% per Annual Period

Table 6.1.2 Natural gas

Tariff Number or Designation:	General Firm Service (GFS)	
Utility Name:	Gainesville Regional Utility	
Rate Structure:	$1.39	$ per Therm
Rate Escalation:	1%	% per Annual Period

Table 6.1.3 Water

Tariff Number or Designation:	Non-Residential Service (NRS)	
Utility Name:	Gainesville Regional Utility	
Rate Structure:	$1.23	$ per kgallon
Rate Escalation:	0%	% per Annual Period

Table 6.1.4 Sewer

Tariff Number or Designation:	Non-Residential Dwellings (NRD)	
Utility Name:	Gainesville Regional Utility	
Rate Structure:	$2.75	$ per kgallon
Rate Escalation:	0%	% per Annual Period

Article 7: Contracted Baseline Data

7.1 The following data of this article outlines the operating characteristics that are required to be implemented under the FIM Work. This specific configuration of operating practices is the Contracted Baseline.

Table 7.1.1 Summer/Winter Operating Hours

Day of Week	On Peak Run Hours	Off Peak Run Hours		
Monday	10/10	14/14		
Tuesday	10/10	14/14		
Wednesday	10/10	14/14		
Thursday	10/10	14/14		
Friday	10/10	14/14		
Saturday	0/0	24/24		
Sunday	0/0	24/24		
Holiday	0/0	24/24		

Table 7.1.2 Summer/Winter Operating Temperatures

Day of Week	Summer On Peak Minimum DEG	Winter On Peak Maximum DEG	Summer Off Peak Maximum DEG	Winter Off Peak Minimum DEG
Monday	74	72	80	55
Tuesday	74	72	80	55
Wednesday	74	72	80	55
Thursday	74	72	80	55
Friday	74	72	80	55
Saturday	74	72	80	55
Sunday	74	72	80	55
Holiday	74	72	80	55

Table 7.2.3 Occupancy Summer/Winter

Day of Week	Day	Afternoon	Night	
Monday	80%/80%	60%/60%	20%/20%	
Tuesday	80%/80%	60%/60%	20%/20%	
Wednesday	80%/80%	60%/60%	20%/20%	
Thursday	80%/80%	60%/60%	20%/20%	
Friday	80%/80%	60%/60%	20%/20%	
Saturday	50%/50%	30%/30%	10%/10%	
Sunday	50%/50%	30%/30%	10%/10%	
Holiday	50%/50%	30%/30%	10%/10%	

7.2 Building Inventory – Exhibit D (Technical Audit) outlines the scope of work for each additional or replaced equipment inventory that resulted from the implementation of the FIM Work.

This Exhibit is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT:		**SIEMENS:**	
Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

Technical Audit

Gainesville Police Department

December 2005

SIEMENS

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SIEMENS

GAINESVILLE POLICE DEPARTMENT FACILITY DESCRIPTIONS

OVERVIEW AND BACKGROUND OF PERFORMANCE CONTRACTING

The Gainesville Police Department provides emergency and non-emergency services to more than 25,000 city residents and an estimated 125,000 visitors on a daily basis. The jurisdiction covers approximately 31 square miles and includes houses and apartment complexes, businesses and industrial parks, recreational facilities, including parks on and around Lake Lanier, several golf courses, schools, churches, an airport, a shopping center, and numerous strip malls. They are a multi-faceted professional public safety organization that serves a fast-paced, multi-cultural and rapidly growing community. The Gainesville Police Department employs a total of 114 employees.

For the purposes of this Technical Audit, only the building on 721 NW 6th Street was audited and will be included in the scope of this analysis.

The performance contract is an agreement between an energy services company (SIEMENS) and a facility owner (Gainesville Police Department) under which the energy services company engineers implement facility improvements at no up-front cost to the facility owner. The energy services company typically guarantees the facility owner a minimum level of energy savings from energy efficiency upgrades and retrofits and helps the facility owner secure financing based on that guarantee. Over the contract period—typically between eight (8) and fifteen (15) years—the savings from reduced utility bills are used to pay for the capital investment in the equipment, the installation and related financing fees. Afterward the facility owner retains 100 percent of the savings to use at its discretion.

SIEMENS

GAINESVILLE POLICE DEPARTMENT

DETAILED FACILITY DESCRIPTION

Gainesville Police Department

History

The City of Gainesville was incorporated on April 15, 1869, with a mayor and council-style government. By 1922 the Gainesville Police Department (GPD) consisted of 3 members, the Chief included. In 1935, the Gainesville Police Department built its first radio transmitter. At this time the department had grown to 10 Officers.

The Gainesville Police Department had been headquartered in a few rooms in the basement of the old City Hall building until August of 1953, when the Department was moved into a new building at its present location of 721 NW 6th Street. This new "ultra modern" police building housed the police department, which had grown to a force of 40 Officers, 6 patrol cars, 4 plain cars, and 4 motorcycles.

Also located in the new building were the Municipal court and the Jail, with 5 cells. In 1962, the Police station was renovated, doubling its size. In 1983 a new Police station and a property storage was constructed. The new police station was built as an expansion of the existing building, and utilized the site of the Mayflower building, which was razed.

In 1985 the police and fire dispatch operations were combined and relocated to the Gainesville Police Department. This move decreased the response times of 911 emergency calls and other calls for service. At this time, the Gainesville Police Department grew to over 240 sworn officers, with 120 patrol vehicles, 50 plain vehicles, 4 crime scene vehicles, 10 motorcycles, and 1 helicopter.

Layout

The Gainesville Police Department is a two (2) floor brick building totaling 54,000 square feet. It is located in the downtown area of Gainesville. The building consists mainly of offices, conference rooms, gym, data center and locker rooms. Portions of this building operate 24 hrs per day, 7 days a week and maintain a constant indoor temperature of 74°F. The mechanical room is located next to a conference room which has a sound-proof door as one of the entrances to the mechanical room. The other entrance to the mechanical room is from the outside near where the cooling towers are located. Parking lots exist on two sides of the building. The main lobby consists of a glass-enclosed counter where one or two officers welcome the visitors to the building. An elevator and several staircases provide access to the second floor of the building. A court yard exists in the center of the first floor with a mini garden and some benches.

Mechanical Systems & Energy Measures

Lighting

Lighting systems consist mainly of T-12 fluorescent fixtures with standard magnetic ballasts. Most of these lights are on continuously. The existing exit signs are incandescent.

Heating

One natural gas fired Weil McLain boiler provides hot water, heat and reheat for the Gainesville Police Department. The boiler's capacity is 1,500,000 Btu/hr. The existing boiler is approximately 23 years old and has been repaired and supported structurally with a new housing over the past few years.

The boiler runs all year round and operates at a measured efficiency of 79.5% and producing stack temperature of 490°F. Typically, thermal efficiency reflects how well the boiler vessel transfers heat. The figure usually excludes radiation and convection losses. This combustion efficiency indicates the ability of the burner to use fuel completely without generating carbon monoxide or leaving hydrocarbons unburned.

In these modern times it is possible to obtain boilers with efficiencies at or over 85%. Also, if a boiler runs on natural gas with a stack temperature of 350 °F, the maximum theoretical efficiency of the unit is 83.8% For the boiler to operate at a stated 84% efficiency, the stack temperature must be less than 350 °F. Hence, this boiler is not designed with maximum heat transfer design and high-quality burner arrangement which makes it operate significantly below these values. Premium boiler

designs can operate near theoretical efficiency values.

Cooling

Two (2), 115-ton (each) Carrier centrifugal chillers make the cooling system for the building. These are nearing the end of their useful life (installed in 1982) and have started showing degradation in efficiency. One chiller can satisfy the load of the entire building only when outside air temperature is below 85°F. At temperatures above 85°F, the second chiller will operate at part load as chiller one backs off.

These chillers are controlled by factory mounted controls and they have no reset strategies employed. These chillers use R-11 as their refrigerant. The US Department of Energy (USDOE) in 2000 established a goal of 2005 for federal facilities to reduce the use of ozone-depleting substances and emissions of greenhouse gases by replacing chillers made prior to 1984 that use Class I ozone-depleting substances (CFC-11, CFC-12, CFC-113, CFC-114, CFC-115). These chillers are therefore good candidates for replacement. Our objective is to replace these old, inefficient chillers; install controls to maximize performance and management of chillers and auxiliary equipment.

Cooling Towers

The existing Cooling Towers are approximately 23 years old and near the end of their useful life. They are located outside of the building. There are currently (2) towers with individual fans for each. The bodies of the towers are deteriorated and have rusted through and the units are not in maintainable condition. The tower supports are also deteriorated. The original cooling towers are undersized for the capacity of the chillers. Two half-an-inch pipes are constantly running water over the top of the towers to prevent them from air-locking and some of that water is splashing onto the ground.

Air Distribution

There are six (6), air handling units (AHU) that serve the building. The building is constant air volume system design. Several of these AHUs (AHU 2, 5 and 6) have variable pitch drives and are constantly dumping conditioned outside air into the space. AHU 1 and 3 have Eddy current drives and AHU 4 is factory furnished.

The control of the existing units is as per original design and is based on old technology that uses a double pulley system with variable pitch drives. The units are not adaptable for utilizing VFDs. The units were tested and researched during the audit phase of the project to be retrofitted with Variable Speed Drives but is not feasible. In essence we will have to use the existing technology.

Proposed Facility Improvement Measures

SIEMENS is proposing the installation of Facility Improvement Measures (FIMs) to increase operating efficiency, decrease energy costs and improve the facility environment. These FIMs include:

- **Lighting Retrofit & Occupancy Sensors**
- **Boiler Replacement**
- **Boiler Combustion Controllers**
- **Chiller Replacement**
- **Cooling Tower Metering**
- **Energy Management System Upgrades**
- **New Cooling Towers with Variable Frequency Drives**
- **High Efficient Motors**

Each of these FIMs will be discussed in detail in subsequent sections of this Technical Audit.

UTILITY ANALYSIS

The Gainesville Police Department has three different types of utilities used at the facility. These are Electric, Natural Gas and Water & Sewer.

ELECTRICITY ANALYSIS

Gainesville Regional Utility (GRU) provides electricity for the Gainesville Police Department. There is one main electric meter for the office that GRU monitors.

The GRU retail electric service tariff is General Service Demand (GSD). The rate is divided into a Customer Charge, Demand Charge, Energy Charge and Fuel Adjustment charge that varies monthly.

Customer Charge: Each utility service has a fixed customer charge to recover those costs that GRU must incur to provide service whether or not any consumption is used. Meter repair and replacement expenses, monthly meter reading expenses and the costs of producing and mailing the utility bill are examples of such costs.

Electric Energy Charges: Electric energy charges vary in amount with the level of utility service the customer actually uses. These charges recover those costs that GRU incurs in delivering the utility service to the customer such as costs associated with operating and maintaining the respective transmission and distribution systems of the electric lines. Also included in each energy charge is a taxable portion of fuel costs

Fuel Adjustment Charge: The electric fuel adjustment charges vary in amount with the level of electricity the customer actually uses. This charge recovers the cost of the fuel used to generate electricity. GRU uses primarily coal (71%) and natural gas (21%) to generate electricity. In 1973, the Florida legislature "froze" the amount of fuel costs subject to utility taxes or surcharges. GRU's fuel adjustment charges are the difference between what fuel costs today and what it cost on October 1, 1973, and are exempt from utility taxes and surcharges.

The General Service Demand rate for GPD is as shown in the table on the following page.

SIEMENS

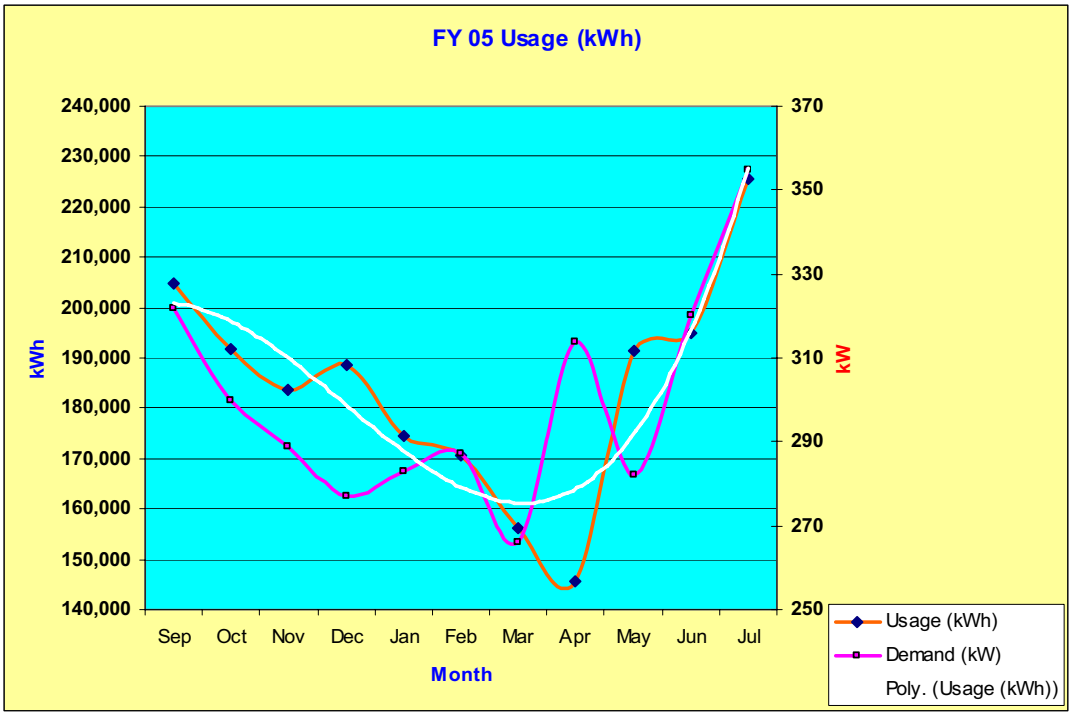
Gainesville Police Department
Rate Analysis

Rate Classification — **General Service, Demand (GSD)**
50 kW > kW > 1,000 kW

Electric Rates

	Notes			Current 2005	Proposed 2006
Customer Charge ($/month)				$15.82	$16.61
Demand Charge ($/kW)				**$5.75**	**$6.33**
Energy Charge ($/kWh)				$0.0240	$0.0240
Fuel Adjustment ($/kWh)	Average fuel adjustment			$0.0350	$0.0410
Total Energy Cost ($/kWh)				**$0.0590**	**$0.0650**
Primary Service Discount ($/kW)	kW > 400 kW			$0.15	$0.15
Metering Discount (kW & kWh)	Metered at primary voltage of 12 kV			2%	2%

The graph below shows the consumption and demand use for GPD during fiscal year 2005.



Base Year Electric Costs

Historical

Month	Date	Demand (kW)	Cost ($)	Unit Cost ($/kW)	Consumption (kWh)	Cost ($)	Unit Cost ($/kWh)
Sep	10/7/03	322	$2,038.26	$6.3300	211,760	$13,764.40	$0.0650
Oct	11/6/03	317	$2,006.61	$6.3300	177,240	$11,520.60	$0.0650
Nov	12/5/03	229	$1,449.57	$6.3300	199,080	$12,940.20	$0.0650
Dec	1/7/04	283	$1,791.39	$6.3300	166,760	$10,839.40	$0.0650
Jan	2/5/04	258	$1,633.14	$6.3300	152,280	$9,898.20	$0.0650
Feb	3/8/04	296	$1,873.68	$6.3300	165,520	$10,758.80	$0.0650
Mar	4/7/04	241	$1,525.53	$6.3300	165,360	$10,748.40	$0.0650
Apr	5/6/04	311	$1,968.63	$6.3300	153,320	$9,965.80	$0.0650
May	6/7/04	355	$2,247.15	$6.3300	191,400	$12,441.00	$0.0650
Jun	7/7/04	380	$2,405.40	$6.3300	197,920	$12,864.80	$0.0650
Jul	8/6/04	343	$2,171.19	$6.3300	223,040	$14,497.60	$0.0650
Aug	9/7/04	333	$2,107.89	$6.3300	204,680	$13,304.20	$0.0650
		3,668	**$23,218.44**	**$6.3300**	**2,208,360**	**$143,543.40**	**$0.0650**

NATURAL GAS ANALYSIS

Gainesville Regional Utility (GRU) provides natural gas for the Gainesville Police Department. There is one main gas meter for the office that GRU monitors.

The GRU gas service tariff is Natural Gas – Firm Service. The rate is divided into a Customer Charge, Energy Charge, Manufactured Gas Plant Recovery Charge and Fuel Adjustment charge that varies monthly.

Electric and Gas Energy Charges: Gas energy charges vary in amount with the level of utility service the customer actually uses. These charges recover those costs that GRU incurs in delivering the utility service to the customer such as costs associated with operating and maintaining the respective transmission and distribution systems of gas lines. Also included in each energy charge is a taxable portion of fuel costs

Fuel Adjustment Charge: The gas fuel adjustment charges vary in amount with the level of gas the customer actually uses. For gas service, fuel costs are those paid by GRU to natural gas and liquid propane gas suppliers. In 1973, the Florida legislature "froze" the amount of fuel costs subject to utility taxes or surcharges. GRU's fuel adjustment charges are the difference between what fuel costs today and what it cost on October 1, 1973, and are exempt from utility taxes and surcharges.

The natural gas rate for GPD is as shown below:

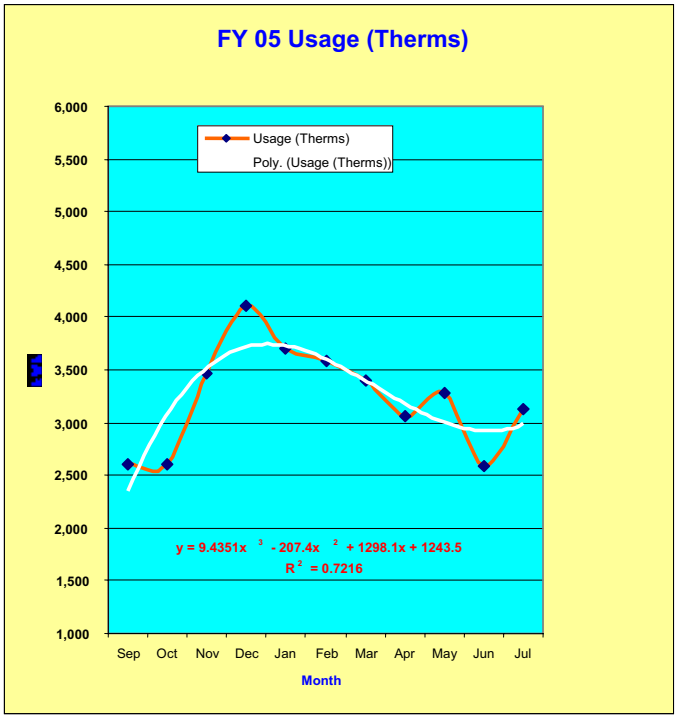
Gainesville Police Department
Rate Analysis

Rate Classification **General Firm Service (GFS)**

Gas Rates

	Notes	Current 2005	Proposed 2006
Customer Charge ($/month)		$17.60	$17.60
Energy Charge ($//therm)	Includes $0.06906 per Therm of fuel	$0.2349	$0.2349
Fuel Adjustment Charge ($/therm)		$0.5644	$1.1232
Manufactured Gas Plant Cost Recovery factor ($/therm)		$0.0321	$0.0321
Total Energy Charge ($/therm)		**$0.8314**	**$1.3902**

The graph below shows the gas usage for GPD during fiscal year 20005.



SIEMENS

Base Year Natural Gas Costs

Historical

Month	Date	Consumption (Therms)	Cost ($)	Unit Cost ($/Therm)
Sep	10/7/03	3,108	$4,320.12	$1.3900
Oct	11/6/03	3,035	$4,218.65	$1.3900
Nov	12/5/03	3,761	$5,227.79	$1.3900
Dec	1/7/04	4,139	$5,753.21	$1.3900
Jan	2/5/04	3,864	$5,370.96	$1.3900
Feb	3/8/04	3,936	$5,471.04	$1.3900
Mar	4/7/04	3,644	$5,065.16	$1.3900
Apr	5/6/04	3,276	$4,553.64	$1.3900
May	6/7/04	3,085	$4,288.15	$1.3900
Jun	7/7/04	2,766	$3,844.74	$1.3900
Jul	8/6/04	2,988	$4,153.32	$1.3900
Aug	9/7/04	2,642	$3,672.38	$1.3900
		40,244	**$55,939.16**	**$1.3900**

WATER AND WASTEWATER ANALYSIS

Gainesville Regional Utility (GRU) provides water & sewer for the Gainesville Police Department. There is one main water & sewer meter for the office that GRU monitors. The GRU water & sewer service tariff is Water Service (Normal Service Meter). The rate is divided into a Customer Charge, and Consumption Charge.

Water Consumption Charge: The water consumption charge varies in amount with the level of water the customer actually uses. It recovers the operating and maintenance costs associated with drawing the water out of the Floridian Aquifer, treating it to drinking water standards, and pumping it through underground water pipes to your business.

Wastewater Usage Charge: Wastewater usage charges recover the operating and maintenance costs of pumping wastewater from your business to one of GRU two wastewater reclamation facilities, processing and treating the wastewater so that the residual wastewater meets drinking standards, and disposing of the wastewater and wastewater by-products. Since wastewater usage cannot be metered, non-residential customers are billed on 95% of their metered water use.

The water & sewer rate for GPD is as shown below:

Gainesville Police Department

Rate Analysis

Rate Classification **Non-Residential Service (NRS)**

Water Rates

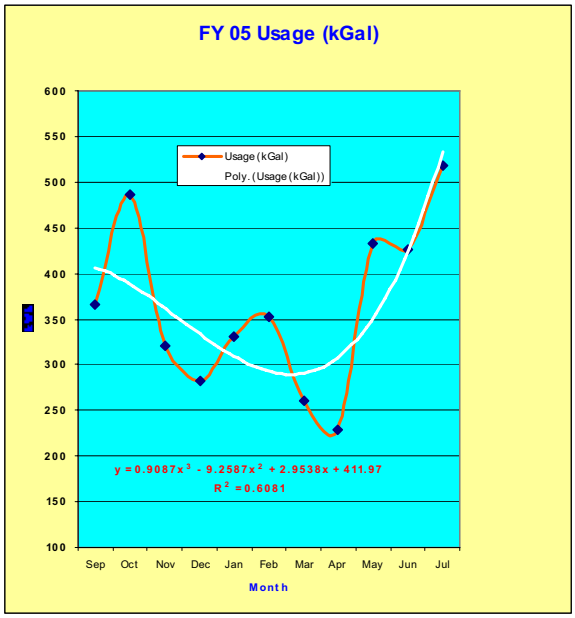
	Notes	Current 2005	Proposed 2006
Customer Charge ($/month)		$3.15	$3.15
Rate per 1,000 gallons (kGal)	No maximum, 95% of water usage	**$1.23**	**$1.23**

Non-Residential Dwellings (NRD)

Wastewater Rates

	Notes	Current 2005	Proposed 2006
Customer Charge ($/month)		$2.39	$2.39
Rate per 1,000 gallons (kGal)	No maximum, 95% of water usage	**$2.75**	**$2.75**

The graph below shows the annual usage of water & sewer for GPD during the fiscal year 2005.



SIEMENS

Base Year Water Costs

Historical

Month	Date	Consumption (kGal)	Cost ($)	Unit Cost ($/kGal)
Sep	10/7/03	596	$2,290.13	$3.98
Oct	11/6/03	480	$1,844.40	$3.98
Nov	12/5/03	328	$1,260.34	$3.98
Dec	1/7/04	260	$999.05	$3.98
Jan	2/5/04	236	$906.83	$3.98
Feb	3/8/04	270	$1,037.48	$3.98
Mar	4/7/04	300	$1,152.75	$3.98
Apr	5/6/04	320	$1,229.60	$3.98
May	6/7/04	468	$1,798.29	$3.98
Jun	7/7/04	394	$1,513.95	$3.98
Jul	8/6/04	430	$1,652.28	$3.98
Aug	9/7/04	320	$1,229.60	$3.98
		4,402	**$16,914.69**	**$3.98**

BENCHMARKING ANALYSIS

Benchmark Analysis

Building Area (SF)	**54,287**

FY04	Electric Annual Consumption (kWh)	Gas Annual Consumption (Therms)	Electric kBtu	Annual Electric Cost ($)	Annual Gas Cost ($)	Total Utilities Cost	Electric Energy Cost Intensity per SF	Gas Energy Cost Intensity per SF	Site Energy Cost Intensity per SF
GPD	2,305,140	40,244	7,865,138	$127,738.49	$34,171.86	$161,910.35	**$2.35**	**$0.63**	**$2.98**
EnergyStar									**$1.23**

1. This compares annual energy use intensities (EUIs) and shows how the energy performance of the building compares to others buildings of similar use.

2. Usually expressed in kBtu/SF, the EUI indicates the rate at which energy is used at in the building.
3. The benchmarking spreadsheet provided allows us to identify where your specific office building ranks relative to others in terms of energy use.
4. The benchmark calculates the energy use intensity (EUI) of your building, provides the typical (median) EUI for office buildings with the same characteristics as yours, and identifies where your building's performance ranks compared to others.
5. The benchmark goes beyond the customary normalization by floor area and account for performance differences due to variations in worker density, the number of personal computers, operating hours, occupancy type, and heating fuel types.
6. Beyond floor area, these characteristics were found to be the most common and most important drivers of electric and non-electric energy use in US office buildings.
7. Climate impacts on energy use are less significant, in part because analyses are conducted within regional census divisions.

SIEMENS

FIM 1– LIGHTING RETROFIT & OCCUPANCY SENSORS

DETAILED DESCRIPTION

System Description	Besides affecting the physical and emotional well-being of the building occupants, a building's interior lighting system is both a dominant consumer of electrical energy and a major source of internal heat. SIEMENS completed a detailed lighting & occupancy survey at the Gainesville Police Department. SIEMENS' strategy to provide an efficient lighting system is to save energy costs by upgrading the existing system with high efficiency state of the art technology. To further reduce the energy costs, lighting controls will be installed where possible.
Existing Opportunities	Most of the building's lighting systems are T-12 with magnetic ballasts. The fluorescent fixtures have a variety of standard and energy saving magnetic ballasts with one, two, three, and four lamp combinations of 34-Watt T-12 lamps. In addition, there are incandescent fixtures that include many high wattage lamps that have a relatively short life and require replacement several times each year. The exit signs are predominantly compact fluorescent technology although some incandescent exit signs remain. The existing controls for the lighting systems consist predominantly of manual wall switches. Based on field observations, lighting logger data, and discussions with facility personnel, it would appear that lighting systems in many areas are left on for extended periods even when the space is unoccupied.
Proposed Solutions	SIEMENS proposes to modify the existing lighting fixtures as well as install new energy efficient lighting fixtures to increase system efficiency. These reductions correspond to a significant decrease in maintenance costs for the lighting systems. Selected areas with very inefficient fixtures or inadequate lighting systems will be redesigned with new fixtures. Lighting controls will be added to maximize the efficiency of lighting systems. Controlling the new energy efficient lighting fixtures based on occupancy will provide additional energy and cost savings. The

associated reduction in lighting equipment operating hours may also produce corresponding maintenance cost savings with increased life of lamps and ballasts.

Scope of Work

In order to optimize the overall electrical savings and provide standardized lamps and ballasts for the campus, SIEMENS proposes to retrofit or replace all existing T-12 fluorescent fixtures with new 28-Watt T-8 lamps and high efficiency electronic ballasts.

Ceiling Sensor

The existing 32-Watt T-8 fluorescent lamps will also be replaced with new 28-watt T-8 lamps. The new 28-Watt energy saving lamp provides additional saving over the standard 32-Watt T-8 lamp. The new 28-Watt T-8 lamp provides excellent color rendering properties (82 CRI) and good lumen maintenance. To maintain IES recommended lighting levels, the 28-Watt lamps will be operated on high efficiency electronic ballasts.

Electronic Ballasts

Where fluorescent fixtures are dimmed or are used in areas exposed to the weather, the 32-Watt T8 lamps will have to be used. The manufacturers of the 28-Watt lamps do not recommend that these lamps be dimmed and the lamp starting and performance is unstable at temperatures below 60 degrees F. Appropriate O&M training will be conducted for the facilities staff on all the recommended technologies.

Reflector Retrofit Kit

Fixtures with eight-foot lamps will be replaced with fixtures containing four-foot lamps. The four-foot T-8 lamp has a longer lamp life than eight-foot lamps (20,000-30,000 hours versus 12,000-15,000 hours), is more economical to purchase, and is easier to handle and store.

This retrofit will offer improved lighting quality and will reduce current maintenance costs substantially by reducing the number of lamps to be inventoried, and eliminating PCB-contaminated ballasts and T-12 lamps containing high levels of mercury.

Wall Switch Sensors

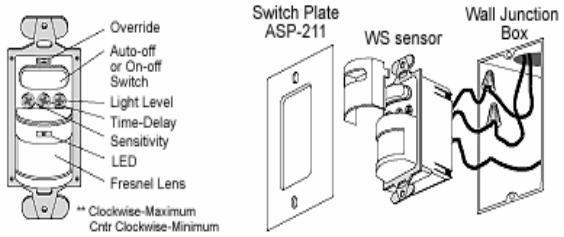
New compact fluorescent or linear fluorescent fixtures will replace existing incandescent lamps. Fluorescent lighting lasts12-25 times longer than the incandescent lamps, has excellent color rendition and uses about one-fourth to one-tenth the energy to produce the same light output.

LED Exit Signs

High Intensity Discharge (HID) fixtures will either be replaced with new fluorescent fixtures or retrofitted with pulse-start metal halide (MH) lamps and ballasts. Existing mercury vapor downlights and surface mounted fixtures will be converted to medium based compact fluorescent lamps.

Any existing fluorescent or incandescent exit signs found will be replaced with new high efficient exit signs containing LED lamps.

To more effectively control the lighting systems during unoccupied periods, occupancy sensors will be installed to keep the lights off when rooms are not in use. Occupancy sensors will be installed in conference rooms, offices and restrooms. Existing controls will be left in place for manual override of automated controls.



The occupancy sensor controls will be ceiling mounted or installed in place of existing wall switches. Dual technology sensors will be used.

The dual technology combines a passive infrared (PIR) and a microphonics sensor to activate the system. The PIR detects an occupant entering the space and turns the lights on. Once the lights are on, the microphonic sensor is engaged to detect occupant noise. As the occupant moves, the sensor detects a change in motion and temperature. Each time the occupant moves or noise is made, the time delay is reset (typically for 10 to 20 minutes). If no noise or motion is detected in the specified interval, the lights are turned off. The dual technology design sensor helps prevent false tripping of the lighting system.

INTEGRATION WITH EXISTING SYSTEMS AND OPERATIONS

Impact on Facility Performance, Operations and

This retrofit will offer improved lighting quality and will reduce maintenance costs by providing new, long life equipment. The T-8 system is maintained just as one would maintain the existing T-12

Maintenance	system. Since the new lamps and ballasts will be covered under their respective manufacturer's warranties, there should be no significant O&M expenses relating to the lighting system during the duration of those warranties.
Special Operating Requirements	There are no special operating requirements associated with this FIM.

EQUIPMENT INFORMATION

Manufacturer and Type

Manufacturer - We expect to install lighting & occupancy sensors from but not limited to the following manufacturers:

Lamps:

Osram-Sylvania Inc. • 100 Endicott St. • Danvers, MA 01923 • (978) 777-1900
TCP• 731 Randall Street Expressway• Bristol VA 24201 • (866) 316-2852
LEDtronics• 100-58 Baker Ct. Island Park, NY 11558 • (516) 889-8874

Ballasts:

Universal Lighting Technologies• 26 Century Blvd. • Nashville, TN 37214 • (800) BALLAST
Osram-Sylvania Inc. • 100 Endicott St. • Danvers, MA 01923 • (978) 777-1900

Fixtures:

Metal Optics. • 2011 W Rundberg Lane • Austin, TX 78758 • (800) 324-2669
Lightolier • 2055-C Scenic Highway • Snellville, GA 30078 • (678) 344-8321
Ruud Lighting• 9201 Washington Ave • Racine, WI 53406 • (262) 886-1900

Reflectors:

Metal Optics • 2011 W Rundberg Lane • Austin, TX 78758 • (800) 324-
US Energysciences • 406A Dixon St. • Vidalia, GA 30475 • (866) 390-9100

Sensors/Controls:

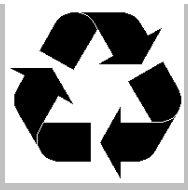
Sensor Switch• 900 Northrop Rd. • Wallingford, CT 06492 • (800) PASSIVE
Lutron• 7200 Suter Rd • Coopersburg, PA 18036 • (888) LUTRON1

SIEMENS

COMMISSIONING PROCEDURE

SIEMENS, in cooperation with GPD personnel, will verify the proper operation of all new lighting equipment. Installed quantities will be field verified. As part of the start-up and commissioning process, the capability of the new equipment after retrofit to provide the required service in accordance with the specifications will be documented.

ENVIRONMENTAL ISSUES



All removal and disposal of existing lighting equipment will be included in the turn-key project. The existing lamps will be recycled in accordance with industry standards. Some existing ballasts may contain polychlorinated biphenyls (otherwise known as PCBs). The removal and proper disposal of any PCB ballasts is included in the project.

MEASUREMENT AND VERIFICATION

For this FIM, SIEMENS will use the Option C (whole building analysis) approach to Measurement & Verification. This method will be described in detail in a subsequent section of this Technical Audit.

TRAINING

The facility's maintenance staff will be provided with a comprehensive training session on the installed lighting equipment. An O&M manual containing the equipment catalog cuts will be provided.

SIEMENS

Calculations for FIM 1: Lighting Retrofit & Occupancy Sensors

Lighting & Occupancy Sensors Savings Calculations

CRITICAL ASSUMPTIONS

Assumptions

The lighting requirements of each building are based on the existing lighting system and the specific occupancy schedules for each area. SIEMENS engineers inventoried the existing light fixtures during a room-by-room field audit and a review of existing drawings. Hours of operation were based on data from installed data loggers, field observations, past experience, and discussions with facility personnel.

1. The baseline energy usage is calculated for each specific area and for the specific type of light fixtures in each area.
2. The value for the power drawn by each existing fixture type is based on the ANSI data, and past experience, and actual measured values. These values are used in the existing system calculations.
3. The total power draw, or lighting load, is determined by multiplying the quantity of existing fixtures by the rated power draw of the particular fixture.
4. The baseline energy usage is calculated by multiplying the lighting load for a particular area by the annual operating hours for that area. The baselines for each area are totaled to determine the overall lighting system baseline.
5. To determine the energy usage of the new lighting system, the rated wattage for each proposed fixture type is based on the ballast manufacturer's rated wattage tables.
6. The lighting load is determined by multiplying the quantity of new fixtures by the rated power draw of the particular fixture.
7. The proposed energy usage is calculated by multiplying the new lighting load for a particular area by the annual operating hours for that area.
8. The lighting savings are calculated for each specific area by subtracting the new energy usage from the baseline energy usage. The sum of these savings is crosschecked against the overall baseline minus the overall proposed usage.

SOUTHERN ENERGY TECHNOLOGIES, INC.

Lighting Systems Analysis Report

City of Gainesville FL

Gainesville PD Lighting Upgrade Ver 1.0

	Existing Lighting System								Proposed Lighting System								
Existing Fixture	**Qty**	**AOH**	**Watts**	**kW**	**kWh/yr**	**kWh/ac**	**TotalkWh**	**Maint $**	**ECM**	**Qty**	**AOH**	**Watts**	**kW**	**kWh/yr**	**kWhac**	**TotalkWh**	**Maint $**
2X4 2 LAMP T12 TROFFER	**112**	**8760**	**8,512**	**8.51**	**74,565**	**17,896**	**92,461**	**$1094**		**112**		**4,704**	**4.70**	**30,611**	**7,347**	**37,958**	**$801**
									2LXS	112	8760	4,704	4.70	30,611	7,347	37,958	$599
									AX12	8	0	0	0.00	0	0	0	$0
									AXM1	14	0	0	0.00	0	0	0	$0
									AXM6	2	0	0	0.00	0	0	0	$0
									AXM7	6	0	0	0.00	0	0	0	$0
2X4 2 LAMP T8 TROFFER	**10**	**8760**	**580**	**0.58**	**5,081**	**1,219**	**6,300**	**$80**		**10**		**540**	**0.54**	**3,311**	**795**	**4,106**	**$0**
									AX12	1	0	0	0.00	0	0	0	$0
									AXM1	1	0	0	0.00	0	0	0	$0
									AXM7	1	0	0	0.00	0	0	0	$0
									NO2T8	10	6132	540	0.54	3,311	795	4,106	$0
2X4 3 LAMP T12 EGG CRATE	**16**	**8760**	**2,208**	**2.21**	**19,342**	**4,642**	**23,984**	**$265**		**16**		**1,008**	**1.01**	**6,181**	**1,483**	**7,665**	**$154**
									3LXS	16	6132	1,008	1.01	6,181	1,483	7,665	$99
									AX12	2	0	0	0.00	0	0	0	$0
									AXM1	1	0	0	0.00	0	0	0	$0
									AXM7	1	0	0	0.00	0	0	0	$0
2X4 3 LAMP T12 MODULAR	**4**	**8760**	**552**	**0.55**	**4,836**	**1,161**	**5,996**	**$66**		**4**		**252**	**0.25**	**1,545**	**371**	**1,916**	**$38**
									3LXS	4	6132	252	0.25	1,545	371	1,916	$25
									AXM1	1	0	0	0.00	0	0	0	$0
2X4 3 LAMP T12 TROFFER	**142**	**8760**	**19,596**	**19.60**	**171,661**	**41,199**	**212,860**	**$2355**		**142**		**8,904**	**8.90**	**62,602**	**15,024**	**77,626**	**$1559**
									2LXS	2	8760	84	0.08	736	177	912	$14
									3LXS	140	8760	8,820	8.82	61,866	14,848	76,714	$995
									AX12	7	0	0	0.00	0	0	0	$0
									AXM1	16	0	0	0.00	0	0	0	$0
									AXM7	6	0	0	0.00	0	0	0	$0

SOUTHERN ENERGY TECHNOLOGIES, INC.

Lighting Systems Analysis Report

City of Gainesville FL

Gainesville PD Lighting Upgrade Ver 1.0

	Existing Lighting System								Proposed Lighting System								
Existing Fixture	**Qty**	**AOH**	**Watts**	**kW**	**kWh/yr**	**kWh/ac**	**TotalkWh**	**Maint $**	**ECM**	**Qty**	**AOH**	**Watts**	**kW**	**kWh/yr**	**kWhac**	**TotalkWh**	**Maint $**
2X4 4 LAMP T12 PARABOLIC	**8**	**8760**	**1,216**	**1.22**	**10,652**	**2,557**	**13,209**	**$156**		**8**		**672**	**0.67**	**3,679**	**883**	**4,562**	**$89**
									4LXS	8	8760	672	0.67	3,679	883	4,562	$53
									AX12	1	0	0	0.00	0	0	0	$0
									AXM7	1	0	0	0.00	0	0	0	$0
2X4 4 LAMP T12 TROFFER	**195**	**8760**	**29,640**	**29.64**	**259,646**	**62,315**	**321,962**	**$3809**		**195**		**16,380**	**16.38**	**100,589**	**24,141**	**124,731**	**$2434**
									4LXS	195	8760	16,380	16.38	100,589	24,141	124,731	$1436
									AX12	9	0	0	0.00	0	0	0	$0
									AXM1	49	0	0	0.00	0	0	0	$0
									AXM7	8	0	0	0.00	0	0	0	$0
2X4 4 LAMP T8 TROFFER	**7**	**8760**	**777**	**0.78**	**6,807**	**1,634**	**8,440**	**$102**		**7**		**735**	**0.74**	**4,507**	**1,082**	**5,589**	**$0**
									AXM1	2	0	0	0.00	0	0	0	$0
									NO4T8	7	6132	735	0.74	4,507	1,082	5,589	$0
2X4 4 LAMP T12 WRAP	**2**	**8760**	**304**	**0.30**	**2,663**	**639**	**3,302**	**$39**		**2**		**168**	**0.17**	**1,104**	**265**	**1,369**	**$27**
									4LXS	2	8760	168	0.17	1,104	265	1,369	$16
									AXM1	1	0	0	0.00	0	0	0	$0
1X4 1 LAMP T12 PARABOLIC TROFFER	**10**	**8760**	**480**	**0.48**	**4,205**	**1,009**	**5,214**	**$67**		**10**		**220**	**0.22**	**1,349**	**324**	**1,673**	**$40**
									1LXS	10	6132	220	0.22	1,349	324	1,673	$40
									AX12	1	0	0	0.00	0	0	0	$0
									AXM7	1	0	0	0.00	0	0	0	$0
1X4 1 LAMP STRIP	**10**	**8760**	**500**	**0.50**	**4,380**	**1,051**	**5,431**	**$65**		**10**		**220**	**0.22**	**1,580**	**379**	**1,960**	**$46**
									1LXS	10	8760	220	0.22	1,580	379	1,960	$46
1X4 1 LAMP TROFFER	**10**	**8760**	**480**	**0.48**	**4,205**	**1,009**	**5,214**	**$67**		**10**		**220**	**0.22**	**964**	**231**	**1,195**	**$28**
									1LXS	10	4380	220	0.22	964	231	1,195	$28
									AX12	2	0	0	0.00	0	0	0	$0
									AXM6	2	0	0	0.00	0	0	0	$0

SOUTHERN ENERGY TECHNOLOGIES, INC.

Lighting Systems Analysis Report

City of Gainesville FL

Gainesville PD Lighting Upgrade Ver 1.0

	Existing Lighting System								Proposed Lighting System								
Existing Fixture	**Qty**	**AOH**	**Watts**	**kW**	**kWh/yr**	**kWh/ac**	**TotalkWh**	**Maint $**	**ECM**	**Qty**	**AOH**	**Watts**	**kW**	**kWh/yr**	**kWhac**	**TotalkWh**	**Maint $**
1X4 1 LAMP T8 TROFFER	**20**	**8760**	**560**	**0.56**	**4,906**	**1,177**	**6,083**	**$98**		**20**		**640**	**0.64**	**2,803**	**673**	**3,476**	**$0**
									AX12	2	0	0	0.00	0	0	0	$0
									AXM7	2	0	0	0.00	0	0	0	$0
									NO1T8	20	4380	640	0.64	2,803	673	3,476	$0
1X4 2 LAMP T12 MODULAR	**87**	**8760**	**6,612**	**6.61**	**57,921**	**13,901**	**71,822**	**$850**		**87**		**3,654**	**3.65**	**23,731**	**5,695**	**29,426**	**$621**
									2LXS	87	8760	3,654	3.65	23,731	5,695	29,426	$464
									AX12	13	0	0	0.00	0	0	0	$0
									AXM1	1	0	0	0.00	0	0	0	$0
									AXM7	18	0	0	0.00	0	0	0	$0
1X4 2 LAMP T12 STRIP	**1**	**8760**	**76**	**0.08**	**666**	**160**	**826**	**$10**		**1**		**42**	**0.04**	**368**	**88**	**456**	**$10**
									2LXS	1	8760	42	0.04	368	88	456	$7
1X4 2 LAMP T12 TROFFER	**85**	**8760**	**6,460**	**6.46**	**56,590**	**13,582**	**70,171**	**$830**		**85**		**3,570**	**3.57**	**21,008**	**5,042**	**26,050**	**$550**
									2LXS	85	8760	3,570	3.57	21,008	5,042	26,050	$411
									AX12	15	0	0	0.00	0	0	0	$0
									AXM1	3	0	0	0.00	0	0	0	$0
									AXM6	7	0	0	0.00	0	0	0	$0
									AXM7	10	0	0	0.00	0	0	0	$0
1X4 2 LAMP T12 VAPOR TIGHT	**12**	**8760**	**912**	**0.91**	**7,989**	**1,917**	**9,907**	**$117**		**12**		**504**	**0.50**	**4,415**	**1,060**	**5,475**	**$116**
									2LXS	12	8760	504	0.50	4,415	1,060	5,475	$86
1X4 2 LAMP T12 WRAP	**65**	**8760**	**4,940**	**4.94**	**43,274**	**10,386**	**53,660**	**$635**		**65**		**2,730**	**2.73**	**21,928**	**5,263**	**27,191**	**$574**
									2LXS	65	8760	2,730	2.73	21,928	5,263	27,191	$429
									AX10	1	0	0	0.00	0	0	0	$0
									AXM1	6	0	0	0.00	0	0	0	$0
1X4 2 LAMP WALL BRACKET	**7**	**8760**	**532**	**0.53**	**4,660**	**1,118**	**5,779**	**$68**		**7**		**294**	**0.29**	**1,288**	**309**	**1,597**	**$34**
									2LXS	7	4380	294	0.29	1,288	309	1,597	$25

SOUTHERN ENERGY TECHNOLOGIES, INC.

Lighting Systems Analysis Report

City of Gainesville FL

Gainesville PD Lighting Upgrade Ver 1.0

	Existing Lighting System								Proposed Lighting System								
Existing Fixture	**Qty**	**AOH**	**Watts**	**kW**	**kWh/yr**	**kWh/ac**	**TotalkWh**	**Maint $**	**ECM**	**Qty**	**AOH**	**Watts**	**kW**	**kWh/yr**	**kWhac**	**TotalkWh**	**Maint $**
2X2 2 LAMP U6 TROFFER	**2**	**8760**	**152**	**0.15**	**1,332**	**320**	**1,651**	**$30**		**2**		**96**	**0.10**	**715**	**172**	**886**	**$22**
									6LX	2	8760	96	0.10	715	172	886	$18
									AXM1	1	0	0	0.00	0	0	0	$0
1 LAMP 100w INC RECESSED FIXTURE	**21**	**8760**	**2,100**	**2.10**	**18,396**	**4,415**	**22,811**	**$559**		**21**		**504**	**0.50**	**3,995**	**959**	**4,953**	**$260**
									22	21	8760	504	0.50	3,995	959	4,953	$260
									AXM1	1	0	0	0.00	0	0	0	$0
1 LAMP 100w INC SURFACE MOUNT	**2**	**8760**	**200**	**0.20**	**1,752**	**420**	**2,172**	**$53**		**2**		**68**	**0.07**	**417**	**100**	**517**	**$10**
									F10W	2	6132	68	0.07	417	100	517	$7
									SRF	2	8760	-200	-0.20	-1,752	-420	-2,172	$0
2 LAMP INC SURFACE MOUNT FIXTURE	**7**	**8760**	**1,400**	**1.40**	**12,264**	**2,943**	**15,207**	**$373**		**7**		**238**	**0.24**	**1,489**	**357**	**1,847**	**$36**
									AX10	1	0	0	0.00	0	0	0	$0
									AXM1	3	0	0	0.00	0	0	0	$0
									F10W	7	8760	238	0.24	1,489	357	1,847	$25
									SRF	7	8760	-1,400	-1.40	-12,264	-2,943	-15,207	$0
INCANDESCENT EXIT SIGN	**8**	**8760**	**320**	**0.32**	**2,803**	**673**	**3,476**	**$503**		**8**		**16**	**0.02**	**140**	**34**	**174**	**$0**
									FE27	8	8760	16	0.02	140	34	174	$0
									SRF	8	8760	-320	-0.32	-2,803	-673	-3,476	$0
Gainesville PD Lighting Upgrade	**843**		**89,109**	**89.11**	**780,595**	**187343**	**967938**	**$12,293**		**843**		**46,379**	**46.38**	**300,319**	**72,077**	**372,396**	**$7,449**

SIEMENS

Detailed Scope of Work for FIM 1: Lighting Retrofit & Occupancy Sensors

Scope of Work

Client: *City of Gainesville FL*

Proposal: *Gainesville PD Lighting Upgrade Ver 1.0*
Phase: *Gainesville PD Lighting Project*
Facility: *Gainesville Police Headquarters*
721 NW 6th St
Gainesville, FL 32602

Building: **Police Headquarters Building**

1 **Entrance**
Retrofit 4 1 LAMP 100w INC RECESSED FIXTUREs. with 4 23w COMPACT FLUOR. LAMPs.

2 **Foyer**
Retrofit 7 2X4 2 LAMP T12 TROFFERs. with 7 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

3 **Dispatch**
Remove 1 INCANDESCENT EXIT SIGN.
Install 1 LED EXIT w/ BATTERY.
Retrofit 3 2X4 3 LAMP T12 TROFFERs. with 3 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Retrofit 4 2X4 4 LAMP T12 TROFFERs. with 4 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Retrofit 5 1 LAMP 100w INC RECESSED FIXTUREs. with 5 23w COMPACT FLUOR. LAMPs.

4 **Mech Rm (Exterior)**
Retrofit 14 1X4 2 LAMP T12 WRAPs. with 14 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

5 **Rear Door**
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.

6 **Gymnasium 1300**
Retrofit 22 2X4 2 LAMP T12 TROFFERs. with 22 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 2 MP-277 POWER PACKs.
Install 2 US- 2000 U/S CMt SENSORs.

7 **Stairwell 1301**
Retrofit 5 1X4 2 LAMP T12 WRAPs. with 5 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

8 **Mens RR 1304**
Retrofit 2 1X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP WALL BRACKET. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

9 **Lockers 1305**
Retrofit 22 1X4 2 LAMP T12 TROFFERs. with 22 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 2 MP-277 POWER PACKs.
Install 3 US- 2000 U/S CMt SENSORs.

10 **Rear Hallway**
Retrofit 10 1X4 2 LAMP T12 MODULARs. with 10 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 2 MP-277 POWER PACKs.
Install 3 US- 2000 U/S CMt SENSORs.

11 **Ladies RR 1303**
Retrofit 2 1X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP WALL BRACKET. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

12 **Lockers 1307**
Remove 4 INCANDESCENT EXIT SIGNs.
Install 4 LED EXIT w/ BATTERYs.
Retrofit 10 1X4 2 LAMP T12 TROFFERs. with 10 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 2 MP-277 POWER PACKs.
Install 2 US- 2000 U/S CMt SENSORs.

13 **Side Hallway**
Retrofit 8 1X4 2 LAMP T12 TROFFERs. with 8 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 2 US- 2000 U/S CMt SENSORs.

Scope of Work

Client: *City of Gainesville FL*

Proposal: *Gainesville PD Lighting Upgrade Ver 1.0*
Phase: *Gainesville PD Lighting Project*
Facility: *Gainesville Police Headquarters*
721 NW 6th St
Gainesville, FL 32602

Building: **Police Headquarters Building**

14 **Office 1209**
Retrofit 10 2X4 4 LAMP T12 TROFFERs. with 10 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

15 **Room 1208**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

16 **Office 1207**
Retrofit 6 2X4 4 LAMP T12 TROFFERs. with 6 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

17 **Office 1212**
Retrofit 6 2X4 4 LAMP T12 TROFFERs. with 6 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

18 **Open Office Area**
Retrofit 6 2X4 3 LAMP T12 TROFFERs. with 6 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Retrofit 1 2X2 2 LAMP U6 TROFFER. with 1 2L LW HIGH-EFFICIENCY EB w/ (2) FBO32U6.

19 **Office 1205**
Retrofit 4 2X4 3 LAMP T12 TROFFERs. with 4 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.

20 **Supply Rm**
Retrofit 4 1X4 2 LAMP T12 TROFFERs. with 4 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

21 **Office 1204**
Retrofit 3 2X4 3 LAMP T12 TROFFERs. with 3 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

22 **Office 1203**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

23 **Office 1202**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

24 **Office 1201**
Remove 3 INCANDESCENT EXIT SIGNs.
Install 3 LED EXIT w/ BATTERYs.
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

25 **Display Case (Hall)**
Retrofit 1 1X4 1 LAMP STRIP. with 1 1L LW HIGH-EFFICIENCY BALLAST w/(1) FO28/SS.

26 **Office 1214**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

27 **Office 1213**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

28 **Front Hallway**
Retrofit 9 1X4 2 LAMP T12 MODULARs. with 9 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

Scope of Work

Client: *City of Gainesville FL*

Proposal: *Gainesville PD Lighting Upgrade Ver 1.0*
Phase: *Gainesville PD Lighting Project*
Facility: *Gainesville Police Headquarters*
721 NW 6th St
Gainesville, FL 32602

Building: **Police Headquarters Building**

29 **Closet (hall)**
Remove 1 2 LAMP INC SURFACE MOUNT FIXTURE.
Install 1 1x2 2L WRAP w/ (2) FO17T8.
Install 1 ELECTRONIC TIMER SWITCH.

30 **Restroom 1003**
Retrofit 5 1X4 1 LAMP TROFFERs. with 5 1L LW HIGH-EFFICIENCY BALLAST w/(1) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

31 **Restroom 1005**
Retrofit 5 1X4 1 LAMP TROFFERs. with 5 1L LW HIGH-EFFICIENCY BALLAST w/(1) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

32 **Front Stairwell**
Retrofit 1 2X4 4 LAMP T12 WRAP. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.

33 **Conference 1100**
Retrofit 20 2X4 4 LAMP T12 TROFFERs. with 20 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 2 MP-277 POWER PACKs.
Install 2 US- 2000 U/S CMt SENSORs.

34 **Room 1101**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

35 **Room 1103**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

36 **Main Dipslay Case**
Retrofit 1 1X4 1 LAMP STRIP. with 1 1L LW HIGH-EFFICIENCY BALLAST w/(1) FO28/SS.

37 **Lt. Scott Office**
Remove 2 1 LAMP 100w INC SURFACE MOUNTs.
Install 2 1x2 2L WRAP w/ (2) FO17T8s.
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

38 **Auditorium**
Retrofit 20 1X4 1 LAMP T8 TROFFERs. with 20 NO ACTION 1L F32T8s.
Install 2 MP-277 POWER PACKs.
Install 2 US- 2000 U/S CMt SENSORs.
[NOT APPLICABLE] 17 1 LAMP 75w INC RECESSED on DIMMERs.

39 **Kitchen**
Remove 1 2 LAMP INC SURFACE MOUNT FIXTURE.
Install 1 1x2 2L WRAP w/ (2) FO17T8.

40 **K Restroom**
Remove 1 2 LAMP INC SURFACE MOUNT FIXTURE.
Install 1 1x2 2L WRAP w/ (2) FO17T8.

41 **Copy Rm**
Retrofit 1 2X4 4 LAMP T12 WRAP. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

42 **Alarm Room**
Retrofit 1 1X4 2 LAMP T12 STRIP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.

Scope of Work

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721 NW 6th St
Gainesville, FL 32602

Building: **Police Headquarters Building**

42 **Alarm Room**
Retrofit 2 1X4 2 LAMP T12 WRAPs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
[NOT APPLICABLE] 3 2X4 3 LAMP T8 TROFFERs.
[NOT APPLICABLE] 2 1x4 2 LAMP T8 TROFFERs.

43 **Ladies RR 1518**
Retrofit 2 1X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP WALL BRACKET. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

44 **Side Stairwell**
Retrofit 3 1X4 2 LAMP T12 WRAPs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

45 **Mens RR 1516**
Remove 1 2 LAMP INC SURFACE MOUNT FIXTURE.
Install 1 1x2 2L WRAP w/ (2) FO17T8.
Install 1 LH-US-I WM SENSOR.

46 **Short Hall**
Retrofit 3 1X4 2 LAMP T12 TROFFERs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

47 **Room 1515**
Retrofit 6 2X4 2 LAMP T12 TROFFERs. with 6 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

48 **Room 1513**
Retrofit 4 2X4 4 LAMP T12 TROFFERs. with 4 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

49 **Room1512**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

50 **Break 1512**
Retrofit 4 2X4 2 LAMP T12 TROFFERs. with 4 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

51 **Rear Stairwell**
Retrofit 4 1X4 2 LAMP T12 WRAPs. with 4 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

52 **Telephone Room**
Retrofit 4 1X4 2 LAMP T12 WRAPs. with 4 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

53 **Records Room**
Retrofit 2 2X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 4 2X4 3 LAMP T12 TROFFERs. with 4 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Retrofit 10 2X4 4 LAMP T12 TROFFERs. with 10 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.
Install 1 US- 2000 U/S CMt SENSOR.
Install 2 MP-277 POWER PACKs.

54 **Records Office**
Retrofit 20 2X4 4 LAMP T12 TROFFERs. with 20 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.

55 **Office 1507**

Scope of Work

Client: *City of Gainesville FL*

Proposal: *Gainesville PD Lighting Upgrade Ver 1.0*
Phase: *Gainesville PD Lighting Project*
Facility: *Gainesville Police Headquarters*
721 NW 6th St
Gainesville, FL 32602

Building: **Police Headquarters Building**

55 **Office 1507**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

56 **Office 1504**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Retrofit 2 1X4 2 LAMP T12 MODULARs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.

57 **Open Office**
Retrofit 20 2X4 3 LAMP T12 TROFFERs. with 20 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.

58 **Side Rear Stairs**
Retrofit 3 1X4 2 LAMP T12 WRAPs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

59 **Hallway**
Retrofit 5 1X4 2 LAMP T12 MODULARs. with 5 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

60 **Office 1414**
Retrofit 4 2X4 2 LAMP T8 TROFFERs. with 4 NO ACTION 2L F32T8s.
Install 1 LH-US-I WM SENSOR.

61 **Parking**
Retrofit 12 1X4 2 LAMP T12 VAPOR TIGHTs. with 12 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

62 **Room 1412**
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

63 **Room 1411**
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

64 **Hallway (Divider)**
Retrofit 15 1X4 2 LAMP T12 MODULARs. with 15 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 2 MP-277 POWER PACKs.
Install 3 US- 2000 U/S CMt SENSORs.

65 **Office 1407**
Retrofit 6 2X4 2 LAMP T12 TROFFERs. with 6 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

66 **Office 1409**
Retrofit 2 2X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

67 **Office 1410**
Retrofit 2 2X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

68 **Work Area**
Retrofit 6 2X4 2 LAMP T8 TROFFERs. with 6 NO ACTION 2L F32T8s.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

69 **Back Stairs**
Retrofit 3 1X4 2 LAMP T12 WRAPs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

70 **Room 1400**
Retrofit 8 2X4 3 LAMP T12 TROFFERs. with 8 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.

Scope of Work

Client: *City of Gainesville FL*

Proposal: *Gainesville PD Lighting Upgrade Ver 1.0*
Phase: *Gainesville PD Lighting Project*
Facility: *Gainesville Police Headquarters*
721 NW 6th St
Gainesville, FL 32602

Building: **Police Headquarters Building**

70 **Room 1400**
Retrofit 3 1X4 2 LAMP T12 TROFFERs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.
Install 1 LH-US-I WM SENSOR.

71 **Room 1401**
Retrofit 15 2X4 2 LAMP T12 TROFFERs. with 15 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 2X2 2 LAMP U6 TROFFER. with 1 2L LW HIGH-EFFICIENCY EB w/ (2) FBO32U6.
Install 2 MP-277 POWER PACKs.
Install 2 US- 2000 U/S CMt SENSORs.
Install 1 LH-US-I WM SENSOR.

72 **Exterior Atrium**
Retrofit 6 1X4 2 LAMP T12 TROFFERs. with 6 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 4 1X4 2 LAMP T12 WRAPs. with 4 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 8 1 LAMP 100w INC RECESSED FIXTUREs. with 8 23w COMPACT FLUOR. LAMPs.

73 **Office 1104**
Retrofit 3 2X4 3 LAMP T12 TROFFERs. with 3 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

74 **Office (Side)**
Retrofit 3 2X4 3 LAMP T12 TROFFERs. with 3 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

75 **2ND FLOOR Elevator**
Retrofit 2 1X4 1 LAMP STRIPs. with 2 1L LW HIGH-EFFICIENCY BALLAST w/(1) FO28/SSs.

76 **Mens RR 2413**
Retrofit 2 1X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP WALL BRACKET. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

77 **Ladies RR 2414**
Retrofit 3 1X4 2 LAMP T12 TROFFERs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP WALL BRACKET. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

78 **Rear Hall 2**
Retrofit 10 1X4 2 LAMP T12 MODULARs. with 10 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 2 MP-277 POWER PACKs.
Install 3 US- 2000 U/S CMt SENSORs.

79 **Office 2400**
Retrofit 5 2X4 4 LAMP T12 TROFFERs. with 5 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

80 **Office 2401**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

81 **Office 2403**
Retrofit 3 2X4 4 LAMP T12 TROFFERs. with 3 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

82 **Office 2405**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

Scope of Work

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Gainesville, FL 32602

Building: **Police Headquarters Building**

83 **Office 2404**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

84 **Open Area 2**
Retrofit 21 2X4 2 LAMP T12 TROFFERs. with 21 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.

85 **Office 2408**
Retrofit 1 2X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

86 **Office 2409**
Retrofit 1 2X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

87 **Office 2410**
Retrofit 1 2X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

88 **Office 2411**
Retrofit 1 2X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

89 **Elevator Rm 2417**
Retrofit 2 1X4 2 LAMP T12 WRAPs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

90 **Room 2418**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

91 **Mechanical 2419**
Retrofit 2 1X4 2 LAMP T12 WRAPs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

92 **Forensics**
Retrofit 12 2X4 3 LAMP T12 TROFFERs. with 12 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Retrofit 3 1X4 2 LAMP T12 MODULARs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

93 **Forensics Lab**
Retrofit 8 2X4 2 LAMP T12 TROFFERs. with 8 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

94 **Room 2516**
Retrofit 2 2X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 4 2X4 3 LAMP T12 TROFFERs. with 4 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.

95 **Room 2504**
Retrofit 1 2X4 3 LAMP T12 TROFFER. with 1 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SS.
Install 1 LH-US-I WM SENSOR.

96 **Room 2512**
Retrofit 4 2X4 4 LAMP T12 TROFFERs. with 4 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Retrofit 2 1X4 2 LAMP T12 WRAPs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.

97 **Short Hall 2**
Retrofit 4 1X4 2 LAMP T12 TROFFERs. with 4 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

98 **Room 2505**
Retrofit 1 2X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.

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Gainesville, FL 32602

Building: **Police Headquarters Building**

98 **Room 2505**
Install 1 LH-US-I WM SENSOR.

99 **Room 2506**
Retrofit 1 2X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

100 **Room 2507**
Retrofit 2 2X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

101 **Room 2511**
Retrofit 2 2X4 3 LAMP T12 TROFFERs. with 2 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.

102 **Room 2508**
Retrofit 2 2X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.

103 **Hallway 2**
Retrofit 10 1X4 2 LAMP T12 MODULARs. with 10 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 2 MP-277 POWER PACKs.
Install 3 US- 2000 U/S CMt SENSORs.

104 **Office 2104**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

105 **Office 2105**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

106 **Office 2103**
Retrofit 6 2X4 4 LAMP T12 TROFFERs. with 6 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

107 **Office 2106**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

108 **Office 2107**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

109 **Office 2108**
Retrofit 3 2X4 4 LAMP T12 TROFFERs. with 3 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

110 **Office 2109**
Retrofit 3 2X4 4 LAMP T12 TROFFERs. with 3 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

111 **Room 2102**
Retrofit 2 2X4 3 LAMP T12 TROFFERs. with 2 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

112 **Foyer 2**
Retrofit 2 2X4 3 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

Scope of Work

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Building: **Police Headquarters Building**

113 **Office 2110**
Retrofit 2 2X4 3 LAMP T12 TROFFERs. with 2 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

114 **Room 2419**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

115 **Room 2420**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

116 **Mechanical 2421**
Retrofit 2 1X4 2 LAMP T12 WRAPs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

117 **Room 2300**
Retrofit 7 2X4 3 LAMP T12 TROFFERs. with 7 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

118 **Room 2200**
Retrofit 1 2X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Retrofit 5 2X4 4 LAMP T12 TROFFERs. with 5 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.

119 **Office 2205**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

120 **Office 2204**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

121 **Office 2203**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

122 **Office 2202**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

123 **Office 2209**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

124 **Hallway 2**
Retrofit 12 1X4 2 LAMP T12 MODULARs. with 12 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 2 MP-277 POWER PACKs.
Install 3 US- 2000 U/S CMt SENSORs.

125 **Restroom Hall**
Retrofit 1 2X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

126 **Mens RR 2006**
Retrofit 3 2X4 2 LAMP T12 TROFFERs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP WALL BRACKET. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

127 **Janitor 2007**

Scope of Work

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Building: **Police Headquarters Building**

127 **Janitor 2007**
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 ELECTRONIC TIMER SWITCH.

128 **Ladies RR 2008**
Retrofit 2 1X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Retrofit 1 1X4 2 LAMP WALL BRACKET. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

129 **Office 2004**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

130 **Office 2003**
Retrofit 10 1X4 1 LAMP T12 PARABOLIC TROFFERs. with 10 1L LW HIGH-EFFICIENCY BALLAST w/(1) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

131 **Office 2002**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

132 **Office 2001**
Retrofit 6 2X4 3 LAMP T12 TROFFERs. with 6 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

133 **Office 2000**
Retrofit 5 2X4 3 LAMP T12 TROFFERs. with 5 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

134 **Office 2101**
Retrofit 6 2X4 3 LAMP T12 TROFFERs. with 6 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

135 **Office 2800**
Retrofit 4 2X4 3 LAMP T12 MODULARs. with 4 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

136 **Office 2801**
Retrofit 4 2X4 3 LAMP T12 TROFFERs. with 4 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

137 **Office 2802**
Retrofit 12 2X4 3 LAMP T12 EGG CRATEs. with 12 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Retrofit 4 2X4 4 LAMP T12 TROFFERs. with 4 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 US- 2000 U/S CMt SENSOR.
Install 2 MP-277 POWER PACKs.
Install 1 LH-US-I WM SENSOR.

138 **Office 2803**
Retrofit 4 2X4 3 LAMP T12 EGG CRATEs. with 4 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Retrofit 2 1X4 2 LAMP T12 WRAPs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 LH-US-I WM SENSOR.
Install 1 LH-US-I WM SENSOR.

139 **Rear Hall 2**
Retrofit 11 1X4 2 LAMP T12 MODULARs. with 11 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

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139 **Rear Hall 2**
Install 2 MP-277 POWER PACKs.
Install 2 US- 2000 U/S CMt SENSORs.

140 **Equip Rm 2617**
Retrofit 4 1X4 2 LAMP T12 WRAPs. with 4 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

141 **Restroom 2618**
Remove 1 2 LAMP INC SURFACE MOUNT FIXTURE.
Install 1 1x2 2L WRAP w/ (2) FO17T8.

142 **Mens RR 2619**
Retrofit 1 1X4 2 LAMP T12 TROFFER. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

143 **Office 2600**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

144 **Secretary**
Retrofit 2 2X4 4 LAMP T12 PARABOLICs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.

145 **Chief's Office 2601**
Retrofit 4 2X4 4 LAMP T12 TROFFERs. with 4 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Retrofit 6 1X4 1 LAMP STRIPs. with 6 1L LW HIGH-EFFICIENCY BALLAST w/(1) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

146 **Office -Side**
Retrofit 3 2X4 4 LAMP T8 TROFFERs. with 3 NO ACTION 4L F32T8s.
Install 1 LH-US-I WM SENSOR.

147 **Office 2602**
Retrofit 4 2X4 4 LAMP T8 TROFFERs. with 4 NO ACTION 4L F32T8s.
Install 1 LH-US-I WM SENSOR.

148 **Office 2700**
Retrofit 5 2X4 3 LAMP T12 TROFFERs. with 5 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

149 **Mid-Hallway**
Retrofit 5 1X4 2 LAMP T12 TROFFERs. with 5 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.

150 **Office 2701**
Retrofit 2 2X4 3 LAMP T12 TROFFERs. with 2 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

151 **Restroom 2710**
Remove 1 2 LAMP INC SURFACE MOUNT FIXTURE.
Install 1 1x2 2L WRAP w/ (2) FO17T8.
Install 1 LH-US-I WM SENSOR.

152 **Restroom 2709**
Remove 1 2 LAMP INC SURFACE MOUNT FIXTURE.
Install 1 1x2 2L WRAP w/ (2) FO17T8.
Install 1 LH-US-I WM SENSOR.

153 **Office 2702**
Retrofit 2 2X4 3 LAMP T12 TROFFERs. with 2 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

154 **Office 2703**
Retrofit 12 2X4 3 LAMP T12 TROFFERs. with 12 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 US- 2000 U/S CMt SENSOR.

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154 **Office 2703**
Install 2 MP-277 POWER PACKs.

155 **Office 2707**
Retrofit 6 2X4 3 LAMP T12 TROFFERs. with 6 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.

156 **Equip 2705**
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.

157 **Short-Hall**
Retrofit 3 1X4 2 LAMP T12 TROFFERs. with 3 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.
[NOT APPLICABLE] 1 2X2 3 LAMP BIAX TROFFER.

158 **Library**
Retrofit 8 2X4 4 LAMP T12 TROFFERs. with 8 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.

159 **Room 2603**
Retrofit 4 2X4 4 LAMP T12 TROFFERs. with 4 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

160 **Room 2605**
Retrofit 1 2X4 4 LAMP T12 TROFFER. with 1 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SS.
Install 1 LH-US-I WM SENSOR.

161 **Room 2607**
Retrofit 1 1X4 2 LAMP T12 WRAP. with 1 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SS.
Install 1 LH-US-I WM SENSOR.

162 **Office 2610**
Retrofit 4 2X4 3 LAMP T12 TROFFERs. with 4 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

163 **Office 2609**
Retrofit 4 2X4 3 LAMP T12 TROFFERs. with 4 3L LW HIGH-EFFICIENCY BALLAST w (3) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

164 **Office 2607**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

165 **Break Area 2611**
Retrofit 2 1X4 2 LAMP T12 TROFFERs. with 2 2L LW HIGH-EFFICIENCY BALLAST w (2) FO28/SSs.
Install 1 MP-277 POWER PACK.
Install 1 US- 1000 U/S CMt SENSOR.

166 **Conference 2612**
Retrofit 6 2X4 4 LAMP T12 PARABOLICs. with 6 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Retrofit 4 1 LAMP 100w INC RECESSED FIXTUREs. with 4 23w COMPACT FLUOR. LAMPs.
Install 1 MP-277 POWER PACK.
Install 1 US- 2000 U/S CMt SENSOR.
Install 1 LH-US-I WM SENSOR.
[NOT APPLICABLE] 3 1 LAMP 100w Recessed Dimmables.

167 **Office 2614**
Retrofit 4 2X4 4 LAMP T12 TROFFERs. with 4 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

168 **Office 2615**
Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.

Scope of Work

Client: *City of Gainesville FL*

Proposal: *Gainesville PD Lighting Upgrade Ver 1.0*
Phase: *Gainesville PD Lighting Project*
Facility: *Gainesville Police Headquarters*
721 NW 6th St
Gainesville, FL 32602

Building: **Police Headquarters Building**

168 **Office 2615**

Install 1 LH-US-I WM SENSOR.

169 **Office 2616**

Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

170 **Office 2604**

Retrofit 2 2X4 4 LAMP T12 TROFFERs. with 2 4L LW HIGH-EFFICIENCY BALLAST w (4) FO28/SSs.
Install 1 LH-US-I WM SENSOR.

SIEMENS

FIM 2 –BOILER REPLACEMENT

DETAILED DESCRIPTION

System Description

Efficient and safe boiler operation has long been a concern of maintenance and engineering managers. Boilers are large energy-using systems — typically second only to air conditioning systems in annual energy use. Inefficient boiler operation means wasted energy and increased operating costs. Even a five (5) percent decrease in operating efficiency, applied over the course of a heating season, can affect operating costs significantly.

Existing Opportunities

The existing hot water boiler is relatively energy inefficient and unreliable. It is a Weil McLain 1500 MBH hot water boiler which has reached the end of its useful life.

Existing Weil McLain Boiler

The boiler currently provides hot water for space heating in winter and reheat in the summer. When this boiler shuts off, the heat in the boiler continues to radiate through the jacket. This is lost energy. In addition, boiler-room air continues to flow through the boiler after the burner shuts off. This air is drawn up by chimney draft, cooling off the boiler.

When the boiler turns on again, it must reheat the boiler water back to operating temperature. Further, it must also reheat the chimney to

produce proper draft for efficient combustion. The more often the boiler cycles, the greater the downtime losses and the lower the seasonal efficiency.

Proposed Solutions

SIEMENS proposes to replace the existing boiler with a non-condensing boiler. The new boiler will be sized similar to the existing boiler. The Dominator™ Series from RBI offers the ultimate flexibility in boiler and water heater application. They have efficiencies of 85.1% which are among the highest available in non-condensing boiler and water heater designs. The Dominator can operate using mechanical room air for combustion or by drawing outside air directly as a sealed combustion product. Units can vent combustion gases vertically or horizontally with factory equipped draft-inducer kits.

Scope of Work

This scope of work is to isolate and remove the existing boiler. New shut off valves will be included in the replacement project. The new boiler will be placed in the same location as the old boiler and will not require additional or new electrical wiring. The gas piping will also remain the same. The new boiler will include a new gas manifold and associated devices. Also included in the scope of work of the new boiler will be the provision of a new high efficiency burner assembly.

Siemens Building Technologies, Inc. will not be responsible for the condition of the existing piping. If any further piping needs to be replaced due to lack of water treatment it will be performed outside of this contract cost.

The boiler will be completely pre-assembled at the factory. The new boiler will be installed on the existing pad.

INTEGRATION WITH EXISTING SYSTEMS AND OPERATIONS

Impact on Facility Performance, Operations and Maintenance

This measure will be implemented with minimum impact on building operation. The majority of the work will occur in the boiler room during the non-heating months or during days where heating is at a minimum. There would be about two days of downtime for connecting the new boilers to existing piping. This downtime will be scheduled with the facilities staff to minimize impact on indoor comfort.

The reduced maintenance of the new boilers will positively impact the O&M duties of the facilities staff. Current facilities staff will implement the manufacturer recommended O&M procedures.

To operate properly and safely this boiler requires a continuous supply of air for combustion. NEVER store objects on or around the boiler. Electrical and electronic components must also be protected from exposure to water during operation and maintenance.

Special Operating Requirements

As with any equipment, the manufacturer's recommendations should be followed for operations. In this case, it is important to note that the manufacturer recommends that the return water temperature should not fall below 125 Degrees to minimize thermal shock corrosion in the boiler. The new boilers will also receive a combustion controller as an added stand-alone controller. There are not any additional special operating requirements as compared to the existing boilers.

EQUIPMENT INFORMATION

Manufacturer and Type

Manufacturer - We expect to install a boiler from the following manufacturers (specific manufacturer and model number may change prior to installation):

RBI Water Heaters • 11950 West Lake Park Drive • Milwaukee, WI 53224 • (414) 359-0600

SIEMENS

COMMISSIONING PROCEDURE

SIEMENS, in cooperation with the manufacturer's representative and GPD personnel, will verify the proper operation of all the system. The boiler will be started as described in the manufacturer's "OPERATING INSTRUCTIONS". The boiler will be run for at least an hour.

The system pump(s) and all radiation units must be operated during this time. The system should be checked and bled after three days of operation.

A boiler efficiency test will be performed to confirm the operating efficiency of the boiler. An operational test will be performed to ensure that the hot water reset schedule is appropriately working.

ENVIRONMENTAL ISSUES

No environmental impacts are expected.

MEASUREMENT AND VERIFICATION

For this FIM, SIEMENS will use the Option C (whole building analysis) approach to Measurement & Verification. This method will be described in detail in a subsequent section of this Technical Audit.

TRAINING

The GPD maintenance staff will be provided with a comprehensive, hands-on training session on the new boilers. The session will be provided by the manufacturer's representative (or SIEMENS) and will be conducted at the GPD mechanical room using the actual boiler and O&M manuals provided.

SIEMENS

Calculations for FIM 2: Boiler Replacement

Boiler Replacement Savings Calculations

SIEMENS

CRITICAL ASSUMPTIONS

Assumptions	1. The existing boiler efficiency is 79.5%. 2. The new boiler efficiency is 85%.

TITLE: **Boiler Replacement**
PROJECT: Gainesville Police Department
SITE: Gainesville

DESCRIPTION: Replace existing boiler with new efficient boiler of similar size and operation.

GIVEN:

Fuel Energy Cost	=	$1.39	$/Therm (Nat'l Gas)
Boiler Plant Capacity	=	1500	Mbh
Operation (Hours/Week)	=	168.00	Hours/Week
Operation (Heating Weeks/Year)	=	16.00	Weeks/Year
Operation (Hours/Year)	=	2688	Hours/Year
Annual Heating Plant Energy Cost	=	$55,939	

ASSUMPTION:

Existing Efficiency (Combustion)	=	80%
Existing Efficiency (Dist./Losses)	=	95%
New Efficiency (Combustion)	=	85%
New Efficiency (Dist./Losses)	=	95%
Part Load Factor	=	75%

FORMULA:
Energy Usage = (Capacity(Mbh)) x (Hours of Operation/Year) x (Part Load Factor) / (Combustion Efficiency x Distribution Efficiency)
Fuel Use (Unit) = (Usage (Mbh)) / (Heating Value of Fuel)
Fuel Energy Cost ($) = ((Fuel Use(Unit) x Fuel Cost($/Unit))

CALCULATION:

	Capacity	Hours/Year	Part Load Factor	Efficiency (Comb.)	Efficiency (Dist.)	
Existing Energy Usage = (	1500)x(	2688)x(	75%)/((	80%)x(	95%)) =	**4,003,972 Mbh**
New Energy Usage = (	1500)x(	2688)x(	75%)/((	85%)x(	95%)) =	**3,744,892 Mbh**

	Usage (Mbh)	Conversion(	Mbh/Therm	)	
Existing Fuel Usage = (	4,003,972)/(	100	) =		**40,040 Therm**
New Fuel Usage = (	3,744,892)/(	100	) =		**37,449 Therm**

	Therm		$/fuel unit		
Existing Fuel Cost = (	**40,040**)*(	$1.390	) =		**$ 55,655**
Existing Fuel Cost = (	**37,449**)*(	$1.390	) =		**$ 52,054**

Result

	Existing Annual Use =	**40,040**	**Therm**	**$ 55,655**	**99% of utility bill**
	Proposed Annual Use =	**37,449**	**Therm**	**$ 52,054**	
100%	**Annual Savings =**	**2,591**	**Therm**	**$ 3,601**	
	Savings as Percent of Existing =			**6%**	**6% of utility bill**
80%	**Annual Savings =**	**2,073**	**Therm**	**$ 2,881**	
	Savings as Percent of Existing =			**5%**	**5% of utility bill**

COMMENTS:

SIEMENS

FIM 3 – BOILER COMBUSTION CONTROLLERS

DETAILED DESCRIPTION

System Description	The existing boiler cycles on-and-off based upon water temperature set points. This improvement measure incorporates a controller to optimize boiler operation by prolonging the boiler combustion cycle and minimizing boiler purge before and after the combustion cycle. As a result, the boiler will fire for longer durations but less frequently resulting in reduced fuel consumption.
Existing Opportunities	SIEMENS believes this boiler does not have optimal operational sequences. This condition manifests itself in lower seasonal efficiencies and increased fuel use. Typically boilers are sized to accommodate the coldest days (which only typically occur in 5% of the calendar year, or less). During these periods of maximum demand, the burner is constantly on and the boiler is operating at its maximum capacity. At all other times, the burner cycles on-and-off maintaining temperature or pressure in the boiler. It is during these periods of lesser demand, that the controller will learn the boiler make up rate and efficiently manage the firing of the boiler. The length of the burner's off-cycle is the best measure of total heating demand or load. In other words, the load is directly related to the time it takes for water (or steam) in the boiler to drop from its high-limit temperature (or pressure) to its low-limit or "call" setting. When demand is high, these off-cycles are short and the on-cycles are longer. When demand is lower, off-cycles are longer and on-cycles are reduced.
Proposed Solutions	SIEMENS proposes to install combustion controllers to establish more appropriate sequences that would optimize the boiler operation. The new controllers will be installed to reduce fuel consumption.

MicroTherm or Intellidyne is a patented, UL listed advanced technology, which produce 10% to 20% savings on the cost of heating bills. It is a computer device which will make nearly every boiler run more efficiently with no discomfort to building occupants and no additional responsibility for staff members. These sequences would be coordinated with those for hot water reset and reheat.

The controller calculates the optimum time between off and on cycles and controls burner ignitions accordingly. Unlike any other product, the controller can, at any time, actually compute its economy in terms of percentage savings and reduced ignitions, displaying it on the LCD screen.

Scope of Work

1. SIEMENS will provide the boiler with a combustion controller, installed and wired to the boiler. The controller, in general, will be installed in a NEMA 1 gasketed enclosure, with a door.
2. SIEMENS will install cabinet or control unit on the boiler or boiler frame. Controls will include the electric programming relay, motor controllers and control switches.
3. Controls will include a programming relay for starting and stopping the burner, and provisions for pre-combustion and post-combustion purging. In addition provide a manual-automatic selector switch, to allow for fully automatic firing or manual

control at any desired rate.

Work included for this ECM will be the installation of the controllers needed to implement the new sequences. New sequences will be checked and verified.

INTEGRATION WITH EXISTING SYSTEMS AND OPERATIONS

Impact on Facility Performance, Operations and Maintenance

Gainesville Police Department would see a positive impact on the facility operation. Not only would this ECM save GPD energy, it will help to prolong the useful life of the boilers by insuring that short cycle firing and other detrimental actions do not occur.

Special Operating Requirements

No special operating requirements need be instated for the implementation of this FIM.

EQUIPMENT INFORMATION

Manufacturer and Type

Manufacturer - We expect to install MICROTherm™ or Intellidyne™ from, but not limited to, one of the following manufacturers:

1) **Smart Building Products** • 1523 Route 300 • Newburgh, NY 12550• (800) 972-8040
2) **Tri-Sharp, Inc.** • 82 North Street • Watertown, CT 06795 • (888) 316-0016

COMMISSIONING PROCEDURE

SIEMENS, in cooperation with the controls manufacturer's representative and the GPD personnel, will verify the proper operation of all new controls components.

ENVIRONMENTAL ISSUES

No environmental impacts are expected.

MEASUREMENT AND VERIFICATION

For this FIM, SIEMENS will use the Option C (whole building analysis) approach to Measurement & Verification. This method will be described in detail in a subsequent section of this Technical Audit.

TRAINING

The GPD maintenance staff will be provided with comprehensive, hands-on training session on the boiler control system. The session will be provided by the controls manufacturer's representative (or SIEMENS) and will be conducted at the mechanical room using the actual controls components.

SIEMENS

Calculations for FIM 3: Boiler Combustion Controllers

Boiler Combustion Controllers Savings Calculations

Gainesville Police Department
GPD
Boiler Combustion Controllers Analysis

% savings from cleaning	0.00%
% savings from Combustion Controller	10%
BTU/Gal fuel oil	138,700

Location	No. of Boilers	Baseline Annual Gas Consumption (Therms)	Gas Gal after VAV Conversion & Boiler replacement	Gas Therms after Tune-up	No. of Months Operating	Average Cost of Gas per Therm per Month ($/gal)	Fuel Savings per Year (Therms)	Cost Savings ($)
GPD	1	40,244	37,653		12	$1.3900	3,765	$5,234
							0	$0
							0	$0
							0	$0
							0	$0
							0	$0
							0	$0
							0	$0
							0	$0
							0	$0
Total	**1**	**40,244**		**0**		$1.3900	**3,765**	**$5,234**

Assumptions:

1. MicroTherm monitors daily routine of boiler including its cycles and temperature.
2. MicroTherm determines how long to hold the boiler in an "off" position to maximize the "off" cycle.
3. MicroTherm scales back the number of ignitions without lowering the temperature.
4. Savings range from 10% to 26% using MicroTherm.
5. A 10% guaranteed savings is used based on past historical data submitted.

SIEMENS

FIM 4– CHILLER REPLACEMENT

DETAILED DESCRIPTION

System Description

The goal of this project was to replace two (2) existing CFC-11 (R-11) electric centrifugal chillers with new chillers. Although the existing chillers were in operation to help meet the chilled water demands of the Gainesville Police Department, the use of CFC-11 coupled with the age of the equipment prompted their replacement.

With the signing of the "Montreal Protocol on substances that deplete the ozone layer", refrigerants that are chlorofluorocarbons (CFC) have been phased out. While it is possible to retrofit some existing equipment to utilize non-CFC refrigerants, the age of the existing equipment made the selection of new equipment a better long term decision.

Existing Opportunities

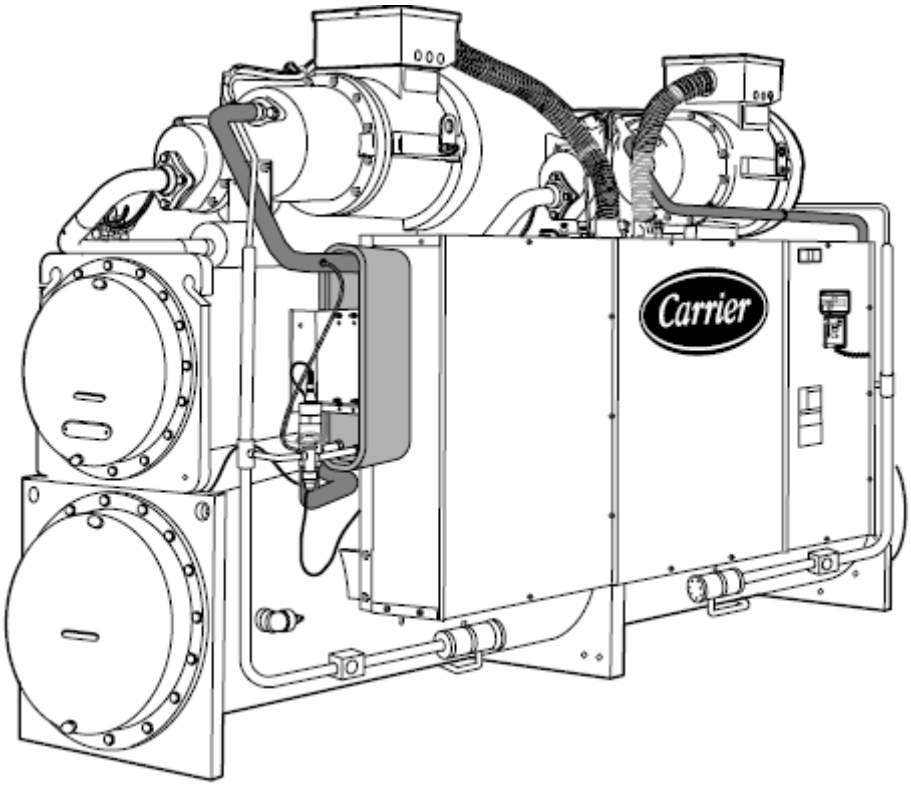
The Gainesville Police Department has two 115-tons Carrier chillers, model number 19DK5113AC used to provide cooling for the entire facility. These were installed in 1982 and at the end of their useful life and Carrier does not manufacture this model. The chillers use R-11 as the refrigerant. Production of R11 or CFC-11 was halted by the clean air act on January 1, 1996.

Existing Chiller at GPD

These chillers are running inefficiently and this inefficiency results in decreased equipment reliability, more frequent maintenance, and shortened lifespan. The slightest decrease in chiller performance can have a major impact on efficiency. For instance, every 1 deg F increase in condenser water temperature above full load design can decrease chiller efficiency by 1-2 percent. It seems like there is also a failing or neglected water treatment program and this can reduce efficiency 10-35 percent, or more in extreme cases.

Proposed Solutions

SIEMENS proposes to install two 115-ton Carrier water-cooled chillers, model 30HXC116 Indoor Water-Cooled Screw Chillers. These chillers use R-134a as the refrigerant. These chillers will have an efficiency of 0.53 kW/ton at IPLV.



Proposed Chiller at GPD

The large, year-round chiller water demands of the building will be met by the operation of two 115-ton water cooled chillers. In most cases, only

one chiller is needed to satisfy the total building cooling water needs.

Considering equipment staging, reliability and available mechanical room space, these two (2) 115-ton chillers provide the best fit for the existing conditions.

Scope of Work

- The scope of work includes the isolation and draining of the existing chillers.
- One chiller will be in service at all times.
- The outside door will be removed for the removal of the existing chillers and for the replacement of the new chillers.
- The chillers will be drained of all refrigerant, disposed of properly and the old chillers will be disposed of by code.
- All applicable re-piping of the chillers will also be performed to conform to the design of the new chillers.
- The new chillers will also be 115 tons and will fit on the existing concrete pads.
- New isolation valve will be installed per chiller.
- The project scope will include the removal of the existing breaker and wiring and the installation of a new breaker and wiring to adhere to the new requirements of the new chilled water system.
- All new piping chilled water piping will be insulated and all condenser water piping will be painted to match existing.
- The chillers will be started by the manufacturer and will be tested, commissioned and approved for startup by Siemens Building Technologies, Inc.
- The chillers will be tied to the building automation system and will include start stop points, status and alarm.

INTEGRATION WITH EXISTING SYSTEMS AND OPERATIONS

Impact on Facility Performance, Operations and Maintenance

Most of the work would occur in the mechanical room with minor disruptions for equipment removal and placement by crane that may occur at night. Proper scheduling will eliminate most impact on normal operations at the Gainesville Police Department.

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location (roof, elevated structures, etc.). Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

When working on this equipment, observe precautions in the literature, and on tags, stickers, and labels attached to the equipment, and any other safety precautions that apply. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling, rigging, and setting this equipment, and in handling all electrical components.

Maintain the equipment according to all manufacturer's instructions.

Special Operating Requirements

A. This unit uses a microprocessor-based electronic control system. Do not use jumpers or other tools to short out components, or to bypass or otherwise depart from recommended procedures. Any short-to-ground of the control board or accompanying wiring may destroy the electronic modules or electrical components.
B. As with all refrigerants, DO NOT VENT refrigerant relief valves within a building. Outlet from relief valves must be vented outdoors in accordance with the latest edition of ANSI/ASHRAE 15 (Safety Code for Mechanical Refrigeration). The accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation. Provide adequate ventilation in enclosed or low overhead areas. Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness or death.

SIEMENS

EQUIPMENT INFORMATION

Manufacturer and Type

Manufacturer - We expect to install the chillers from but not limited to the following manufacturers:

Carrier • P.O. 4808, Carrier Parkway • Syracuse, NY 13221-4808 • 1-800-CARRIER

COMMISSIONING PROCEDURE

The objective of commissioning will be the process for achieving, verifying and documenting the functionality and performance of the equipment installed to meet the operational needs of the site.

SIEMENS, in cooperation with the manufacturer's representative and GPD personnel, will verify the proper operation of all the system. The chillers will be started as described in the manufacturer's "OPERATING INSTRUCTIONS".

An efficiency test will be performed to confirm the operating efficiency of the chillers. An operational test will be performed to ensure that the all reset schedules are appropriately working.

ENVIRONMENTAL ISSUES

No negative environmental impact is anticipated with the implementation of this ECM.

MEASUREMENT AND VERIFICATION

For this FIM, SIEMENS will use the Option C (whole building analysis) approach to Measurement & Verification. This method will be described in detail in a subsequent section of this Technical Audit.

TRAINING

The facility's maintenance staff will be provided with a comprehensive training session on the installed lighting equipment. An O&M manual containing the equipment catalog cuts will be provided.

SIEMENS

Calculations for FIM 4: Chiller Replacement

Chiller Replacement Savings Calculations

SIEMENS

CRITICAL ASSUMPTIONS

Assumptions	1. The two chillers are each 115 tons 2. The existing chiller efficiency is 0.72 kW/ton at IPLV 3. The proposed chiller efficiency is 0.53 kW/ton at IPLV 4. The scheduled usage of the chillers is 70%

TITLE: **Chiller Replacement**
PROJECT: Gaineville Police Department
SITE: Gainesville

DESCRIPTION: Replace existing chiller with new efficient chiller of similar size and operation.

GIVEN:

Electrical Energy Cost	=	$0.065	$/kWh
Electrical Demand Cost	=	$6.33	$/kW
Chiller Capacity	=	115	Tons
Operation (Hours/Year)	=	6,629	Hours/Year
Conversion Factor	=	3,413	Btu/Kw
Conversion Factor	=	12,000	Btu/Ton

ASSUMPTION:

Existing Chiller Efficiency	=	0.72	Kw/Ton	4.883	COP
New Chiller Efficiency	=	0.53	Kw/Ton	6.634	COP
Scheduled Usage	=	70%			

FORMULA:
Energy Use (Kwh)=(Capacity (Tons)*(Hours of Operation/Year)*(Scheduled Usage)*(Efficiency)
Energy Savings (Kwh)=(Existing Energy Use(Kwh)-New Energy Use (Kwh))
Energy Demand (Kw)=(Peak Capacity (Tons)*(Efficiency)
Energy Demand Cost ($)=(Energy Demand (Kw)*(Demand Cost ($/Kw))
Energy Cost Savings ($)=(Energy Savings(Kwh)*($/Kwh))+(Existing Demand Cost ($)-New Demand Cost ($))

CALCULATION:

USAGE	Capacity (Tons)	Hours/Year	Scheduled Usage	Efficiency		
Existing Usage = (	115)*(	6629.24324)*(	70%)*(	0.72) =	**384,231**	**Kwh**
New Usage = (	115)*(	6629.24324)*(	70%)*(	0.53) =	**282,837**	**Kwh**

DEMAND (MONTHLY PEAK CHILLER TONNAGE FROM CHILLER LOGS AND UTILITY ANALYSIS)

MONTH	Peak Tons	EFF. (Kw/Ton)	EX. KW	Cost ($/Kw)	Ex. Demand $
JAN (	50)*(	1.20) =(	60)*(	$6.33) =	$380
FEB (	50)*(	1.20) =(	60)*(	$6.33) =	$380
MAR (	50)*(	1.20) =(	60)*(	$6.33) =	$380
APR (	70)*(	1.90) =(	133)*(	$6.33) =	$842
MAY (	100)*(	0.71) =(	71)*(	$6.33) =	$449
JUN (	65)*(	1.20) =(	78)*(	$6.33) =	$494
JUL (	65)*(	1.20) =(	78)*(	$6.33) =	$494
AUG (	50)*(	1.20) =(	60)*(	$6.33) =	$380
SEP (	50)*(	1.20) =(	60)*(	$6.33) =	$380
OCT (	100)*(	0.71) =(	71)*(	$6.33) =	$449
NOV (	90)*(	1.20) =(	108)*(	$6.33) =	$684
DEC (	50)*(	1.20) =(	60)*(	$6.33) =	$380
TOTALS			**899**		**$5,691**

MONTH	Peak Tons	EFF. (Kw/Ton)	New KW	Cost ($/Kw)	New Demand $
JAN (	50)*(	0.43) =(	22)*(	$6.33) =	$136
FEB (	50)*(	0.43) =(	22)*(	$6.33) =	$136
MAR (	50)*(	0.43) =(	22)*(	$6.33) =	$136
APR (	70)*(	0.59) =(	41)*(	$6.33) =	$261
MAY (	100)*(	0.71) =(	71)*(	$6.33) =	$449
JUN (	65)*(	0.43) =(	28)*(	$6.33) =	$177
JUL (	65)*(	0.43) =(	28)*(	$6.33) =	$177
AUG (	50)*(	0.43) =(	22)*(	$6.33) =	$136
SEP (	50)*(	0.43) =(	22)*(	$6.33) =	$136
OCT (	100)*(	0.71) =(	71)*(	$6.33) =	$449
NOV (	90)*(	0.71) =(	64)*(	$6.33) =	$404
DEC (	50)*(	0.43) =(	22)*(	$6.33) =	$136
TOTALS			**432**		**$2,735**

RESULT:

	kwh	$/kwh	kw	$/kw		
Existing Cost = (	384,231)*(	$0.065)+(	899)*(	$6.33)=	**$30,666**	
New Cost = (	282,837)*(	$0.065)+(	432)*(	$6.33)=	**$21,120**	
Savings =	**101,394 kwh**		**467 kW**		**$9,546**	
	Existing (Kwh)	New (Kwh)				
Energy Savings = (	384,231)-(	282,837) =			**101,394**	kwh
	Savings (kwh)	Cost ($/Kwh)		Existing (Kw) New (Kw)	**26.39%**	of Existing
Energy Savings = (	101,394)*(	$0.065) + (		$5,691)-($ 2,735)=	**$ 9,546**	

COMMENTS: Chiller #1 running all the time

TITLE: **Chiller Replacement**
PROJECT: Gaineville Police Department
SITE: Gainesville

DESCRIPTION: Replace existing chiller with new efficient chiller of similar size and operation.

GIVEN:

Electrical Energy Cost	=	$0.065	$/kWh
Electrical Demand Cost	=	$6.33	$/kW
Chiller Capacity	=	115	Tons
Operation (Hours/Year)	=	1,707	Hours/Year
Conversion Factor	=	3,413	Btu/Kw
Conversion Factor	=	12,000	Btu/Ton

ASSUMPTION:

Existing Chiller Efficiency	=	0.72	Kw/Ton	4.883	COP
New Chiller Efficiency	=	0.53	Kw/Ton	6.634	COP
Scheduled Usage	=	70%			

FORMULA:
Energy Use (Kwh)=(Capacity (Tons)*(Hours of Operation/Year)*(Scheduled Usage)*(Efficiency)
Energy Savings (Kwh)=(Existing Energy Use(Kwh)-New Energy Use (Kwh))
Energy Demand (Kw)=(Peak Capacity (Tons)*(Efficiency)
Energy Demand Cost ($)=(Energy Demand (Kw)*(Demand Cost ($/Kw))
Energy Cost Savings ($)=(Energy Savings(Kwh)*($/Kwh))+(Existing Demand Cost ($)-New Demand Cost ($))

CALCULATION:

USAGE	Capacity (Tons)	Hours/Year	Scheduled Usage	Efficiency		
Existing Usage = (	115)*(	1706.805)*(	70%)*(	0.72) =	**98,926**	**Kwh**
New Usage = (	115)*(	1706.805)*(	70%)*(	0.53) =	**72,821**	**Kwh**

DEMAND (MONTHLY PEAK CHILLER TONNAGE FROM CHILLER LOGS AND UTILITY ANALYSIS)

MONTH	Peak Tons	EFF. (Kw/Ton)	EX. KW	Cost ($/Kw)	Ex. Demand $
JAN (	0)*(	0.72) =(	0)*(	$6.33) =	$0
FEB (	0)*(	0.72) =(	0)*(	$6.33) =	$0
MAR (	0)*(	0.72) =(	0)*(	$6.33) =	$0
APR (	0)*(	0.72) =(	0)*(	$6.33) =	$0
MAY (	0)*(	0.72) =(	0)*(	$6.33) =	$0
JUN (	50)*(	1.20) =(	60)*(	$6.33) =	$380
JUL (	50)*(	1.20) =(	60)*(	$6.33) =	$380
AUG (	65)*(	1.20) =(	78)*(	$6.33) =	$494
SEP (	65)*(	1.20) =(	78)*(	$6.33) =	$494
OCT (	0)*(	0.72) =(	0)*(	$6.33) =	$0
NOV (	0)*(	0.72) =(	0)*(	$6.33) =	$0
DEC (	0)*(	0.72) =(	0)*(	$6.33) =	$0
TOTALS			**276**		**$1,747**

MONTH	Peak Tons	EFF. (Kw/Ton)	New KW	Cost ($/Kw)	New Demand $
JAN (	0)*(	0.53) =(	0)*(	$6.33) =	$0
FEB (	0)*(	0.53) =(	0)*(	$6.33) =	$0
MAR (	0)*(	0.53) =(	0)*(	$6.33) =	$0
APR (	0)*(	0.53) =(	0)*(	$6.33) =	$0
MAY (	0)*(	0.53) =(	0)*(	$6.33) =	$0
JUN (	50)*(	0.43) =(	22)*(	$6.33) =	$136
JUL (	50)*(	0.43) =(	22)*(	$6.33) =	$136
AUG (	65)*(	0.43) =(	28)*(	$6.33) =	$177
SEP (	65)*(	0.43) =(	28)*(	$6.33) =	$177
OCT (	0)*(	0.53) =(	0)*(	$6.33) =	$0
NOV (	0)*(	0.53) =(	0)*(	$6.33) =	$0
DEC (	0)*(	0.53) =(	0)*(	$6.33) =	$0
TOTALS			**99**		**$626**

RESULT:

	kwh	$/kwh	kw	$/kw		
Existing Cost = (	98,926)*(	$0.065)+(	276)*(	$6.33)=	**$8,177**	
New Cost = (	72,821)*(	$0.065)+(	99)*(	$6.33)=	**$5,359**	
Savings =	**26,106 kwh**		**177 kW**		**$2,818**	
	Existing (Kwh)	New (Kwh)				
Energy Savings = (	98,926)-(	72,821) =			**26,106**	kwh
	Savings (kwh)	Cost ($/Kwh)	Existing (Kw)	New (Kw)	**26.39%**	of Existing
Energy Savings = (	26,106)*(	$0.065) + (	$1,747)-(	$ 626)=	**$ 2,818**	

COMMENTS: Chiller #2 running at part load when the outside air temperature is 85 F and above.

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FIM 5– COOLING TOWER METERING

DETAILED DESCRIPTION

System Description

In a cooling tower, water is lost through the evaporative cooling process. To replace lost water and maintain cooling function, makeup water must be added to the cooling tower system. The makeup meter tracks the amount of water that passes through the meter as it goes to the cooling tower. The blow-down meter tracks the amount of water leaving the cooling tower before it actually enters the City's wastewater system. These meters allow facilities to save money by allowing the customer to pay only for the wastewater that reaches the wastewater system.

Existing Opportunities

Water consumption charges are based on meter readings placed at an entry point to the site. The utility calculates sewer charges from these same meter readings based on the assumption that water entering a site will exit the site through the sewer. Although these cooling towers consume large amounts of water for operation, only about 10% of the water returns to the sewer system while the remaining 90% evaporates from the towers. This breakdown equates to a 10:1 reduction of water consumed versus water entering the sewer system.

Existing Cooling Tower at GPD

Proposed Solutions	In a cooling tower, water is lost through evaporation, bleed-off, and drift. To replace the lost water and maintain its cooling function, more make-up water must be added to the tower system. Sometimes water used for other equipment within a facility can be recycled and reused for cooling tower make-up with little or no pre-treatment, including the following: • Water used in a once through cooling system • Pretreated effluent from other processes, provided that any chemicals used are compatible with the cooling tower system. • High-quality municipal wastewater effluent or recycled water (where available) SIEMENS proposes to track water usage. Submeters will be installed for both makeup and blowdown water and the usage logged regularly.
Scope of Work	SIEMENS in conjunction with Gainesville Regional Utility (GRU) will install make-up and blow-down meters on Gainesville Police Department cooling towers. These meters will then be used by GRU for billing purposes.

INTEGRATION WITH EXISTING SYSTEMS AND OPERATIONS

Impact on Facility Performance, Operations and Maintenance	This measure will be implemented with minimum impact on building operation. As part of the overall project will include the replacement of the Cooling Towers (as described in a later FIM), this additional metering will be installed at the time the Cooling Towers are installed. GRU will provide the meters (for a fee) and will read the meters on a monthly basis to determine any charges or credits.
Special Operating Requirements	The water utility (GRU) will need to access the water meters for the purposes of meter reading on a monthly basis. If the meter locations are locked, the utility must be provided monthly access. If the ultimate location of the meters is inaccessible, a remote method of meter reading (radio frequency, remote mounted display, etc) must be deployed.

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EQUIPMENT INFORMATION

Manufacturer and Type

Manufacturer – As the meters will be provided by GRU, we do not have specific manufacturer information at this time.

COMMISSIONING PROCEDURE

The objective of commissioning will be the process for achieving, verifying and documenting the functionality and performance of the make-up water & blowdown meters installed to meet the operational needs of the site, according to the approved design specifications, the site's functional criteria including preparation of the facilities personnel.

In addition, since the chemical control system is integral to the overall amount of water used for Cooling Tower blow down, the correct operation of the chemical feed system will be verified.

Finally, utility bills will be examined to ensure that the appropriate charges are applied.

ENVIRONMENTAL ISSUES

No environmental impacts are expected with the implementation of this FIM.

MEASUREMENT AND VERIFICATION

uses The M&V protocol for this FIM will take the form of measured consumption. Essentially, the impact of the installation of the metering will allow for the reduction in wastewater charges from the utility. Thus, the M&V for this FIM ultimately is an accounting of the credits that apply to the utility bill as a result the implementation of this FIM.

Details of the M&V protocol for this FIM can be found in a subsequent section of this Technical Audit.

TRAINING

There is no additional or ongoing training required for the implementation of this FIM.

SIEMENS

Calculations for FIM 5: Cooling Tower Metering

Cooling Tower Metering Savings Calculations

CRITICAL ASSUMPTIONS

Assumptions	1. The utility will continue to provide meter reading and bill adjustments for the metered values. 2. The utility will maintain the meters. 3. GPD will allow the utility continued access to the meters.

Title: **Cooling Tower Evaporation Loss Metering (Sewer Deduction)**
Project **Gainesville Police Department**
Site **Gainesville**

Description Calculates savings associated with installing a 'deduct' meter on the tower make-up water line

Given

Sewage Rate	=	$ 3.98	$/K gallons
Total Annual City Water Consumption	=	4,402	K gallons
Total Annual Sewer 'Consumption'	=	4,402	K gallons
Total Annual Sewer Cost	=	$ 17,520	
Waterflow thru Tower		1500	GPM

Assumptions

Min. Operating Outside Air Temperature	=	72	deg F
Condenser Water Leaving Tower Temp	=	85	deg F
Cooling Tower Range		10	deg F
Tower Cycles of Concentration	=	6	cycles
Estimated Drift Losses	=	0.002	% of Waterflow

Formula

Water Loss Due to Evaporation = $\frac{\text{Waterflow thru Tower x (Cond Water Ent Tower Temp - Cond Water Lvg Tower Temp) x 500 lb min/gallon hr}}{\text{1000 btu/lb dry air}} \times \frac{\text{1 gallon}}{\text{8.33 lbs}} \times$ Annual Operating Hours x Conversion

Water Loss Due to Drift = Cooling Tower Waterflow x Drift Loss x (minutes per hour) x (hours per year) x Conversion

Water Loss Due to Blowdown = $\frac{\text{(Evaporation Loss + Drift Loss)}}{\text{(Tower Cycles of Concentration - 1)}}$

Calculation

Water Loss from Evaporation =

Bin Temp (DB)	Hrs	Percent Cooling Loading		Waterflow thru Tower (GPM)		Cond Water Ent Twr Temp (deg F)		Cond Water Lvg Twr Temp (deg F)		Constant		Latent Heat of Vaporization		Conversion (lbs of H2O to gal)		Annual Operating Hours		Conversion K gallons/gallon		Total K gallons
99	1	100%	((	1,500	x (	95	-	85	) x	500	) / (	1,000	x	8.33	)) x	1	x	0.001	=	1
97	17	93%	((	1,500	x (	94	-	85	) x	500	) / (	1,000	x	8.33	)) x	17	x	0.001	=	14
95	24	85%	((	1,500	x (	94	-	85	) x	500	) / (	1,000	x	8.33	)) x	24	x	0.001	=	18
93	56	78%	((	1,500	x (	93	-	85	) x	500	) / (	1,000	x	8.33	)) x	56	x	0.001	=	39
91	150	70%	((	1,500	x (	92	-	85	) x	500	) / (	1,000	x	8.33	)) x	150	x	0.001	=	95
89	194	63%	((	1,500	x (	91	-	85	) x	500	) / (	1,000	x	8.33	)) x	194	x	0.001	=	110
87	287	56%	((	1,500	x (	91	-	85	) x	500	) / (	1,000	x	8.33	)) x	287	x	0.001	=	144
85	330	48%	((	1,500	x (	90	-	85	) x	500	) / (	1,000	x	8.33	)) x	330	x	0.001	=	143
83	318	41%	((	1,500	x (	89	-	85	) x	500	) / (	1,000	x	8.33	)) x	318	x	0.001	=	117
81	347	33%	((	1,500	x (	88	-	85	) x	500	) / (	1,000	x	8.33	)) x	347	x	0.001	=	104
79	476	26%	((	1,500	x (	88	-	85	) x	500	) / (	1,000	x	8.33	)) x	476	x	0.001	=	111
77	262	19%	((	1,500	x (	87	-	85	) x	500	) / (	1,000	x	8.33	)) x	262	x	0.001	=	44
75	675	11%	((	1,500	x (	86	-	85	) x	500	) / (	1,000	x	8.33	)) x	675	x	0.001	=	68
73	1004	4%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	1,004	x	0.001	=	33
71	512	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
69	361	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
67	340	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
65	340	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
63	317	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
61	325	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
59	130	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
57	300	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
55	442	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
53	261	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
51	249	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
49	227	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
47	147	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
45	132	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
43	122	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
41	59	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
39	89	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
37	138	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
35	48	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
33	33	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
31	25	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
29	8	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
27	1	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
25	3	0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
		0%	((	1,500	x (	85	-	85	) x	500	) / (	1,000	x	8.33	)) x	-	x	0.001	=	-
Subtotal	8750															4,141				**1,041**

Water Loss from Drift =

	Clg Twr Waterflow		Drift		Minutes per Hour		Hours per Year		K gallons/gallon		
(	1500	) x (	0.00002	) x (	60	) x (	4,141	x	0.001	) =	**7 K gallons**

Water Loss from Blowdown =

	Evaporation Loss		Drift Loss		Cycles of Concentration				
(	1,041	+	7	) / (	6	-	1	) =	**210 K gallons**

Result

SAVINGS AT 100% GUARANTEE

Existing Sewage 'Use'	1,258 K gallons	x	$	3.98 $/K gallons	=	$ 5,007	
Proposed Sewage 'Use'	210 K gallons	x	$	3.98 $/K gallons	=	$ 835	
SAVINGS	**1,048** K gallons					**$ 4,173**	**83% of existing**

SAVINGS AT 80% GUARANTEE

SAVINGS	**839** K gallons	x	$	3.98 $/K gallons	=	**$ 3,338**	**67% of existing**

Checks

Annual Sewage Consumption	4,402 K gallons	x	$	3.98 $/K gallons	=	$ 17,520	
Cooling Tower 'Deduct' Meter Savings	839 K gallons	x	$	3.98 $/K gallons	=	$ 3,338	**19% of existing**

Comments

References

Weather Data is BIN DATA (DRY BULB) from Bin Maker Software
Evaporation equations come from website www.ctdoc.com
Drift equations come from ASHRAE 2000 HVAC Systems & Equations, Chapter 36
Blowdown equations come from Handbook of Water Use and Conservation by Amy Vickers

SIEMENS

FIM 6– EMS UPGRADES

DETAILED DESCRIPTION

System Description

An energy management system (EMS) is a computer that controls the operation of all major building systems, in order to run the building efficiently and effectively. An EMS can reduce a building's overall energy use. SIEMENS will install Apogee at the Gainesville Police Department.

SIEMENS will do three things to improve the likelihood that the energy management system achieves the expected benefits. First, SIEMENS will take advantage of advanced control strategies that make good use of the computer processing power incorporated into energy management systems. Next, SIEMENS will specify these systems in a clear and accurate manner, providing complete information about intended performance, control strategies, and project team responsibilities. Lastly, SIEMENS will adopt a comprehensive approach to quality control known as commissioning. This process includes reviews and inspections throughout the design and construction processes, as well as rigorous performance tests that step the system through its sequences of operation before the building is occupied.

Existing Deficiencies

The implementation of a computer-based monitoring system is not in place. Most of all the mechanical equipment and systems are running all the time or either have ON/OFF switches. The building maintains a constant space temperature 24/7. The chillers have manual controls on the microprocessor control unit as shown below.

Proposed Improvements

An energy management system (EMS) controls how energy is consumed in a building and how building equipment operates. Systems that meet this definition may vary widely in sophistication, from simple time clocks that switch equipment on and off, to advanced computerized controls that provide centralized equipment management**.**

In general, energy management systems save and manage energy by controlling equipment so that:

1. equipment is running only when necessary;
2. equipment is operating at the minimum capacity required;
3. And peak electric demand is minimized.

By providing centralized equipment management, SIEMENS will be able to perform the following measures:

A. DEMAND VENTILATION CONTROL

Properly installed, CO2 DCV can reduce unnecessary over-ventilation that might result if air intakes are set to provide ventilation for a maximum assumed occupancy. This approach, equally applicable to retrofit or new construction can save energy while ensuring that ASHRAE Standard 62 ventilation rates are maintained.

B. CHILLED WATER RESET

The temperature for the chilled water supply is reset to be as high as possible, thereby increasing chiller efficiency. Chilled water systems are commonly designed to provide full cooling load with a chilled water temperature of about 42°F. Plant operators typically leave the chilled water temperature fixed at this value or some other. This is inefficient for most applications, such as air conditioning, where the load is well below its maximum most of the time. Typically, you can raise the chilled water temperature by 5°F to 10°F for much of the time. Even at full load, the typical over sizing of airside components (air handling units, fan-coil units, etc.) usually allows some increase in chilled water temperature.

C. ENTHALPY ECONOMIZER

Enthalpy economizers take advantage of additional (partial) cooling when outside air conditions permit by opening the outside air dampers to 100% when the outdoor air enthalpy is less than the return air enthalpy.

D. HOT WATER RESET

Likewise, in the heating season, the temperature for heating water is reset as low as possible. Hot water reset is a digital control specification for hot water boilers that are typically fired with fuel oil or natural gas. A hot water reset digital control system will measures the outside air temperature using a thermistor. This information is used to estimate demand or heating load as the outdoor temperature varies and modulate the supply hot water temperature up and down range in a linear ratio. Typical range for conventional boilers is to vary the supply water temperature from 140 to 180 degrees F as the outside temperature varies from 65 to 0 degrees F, linearly.

The digital control system can be made to modulate the supply water temperature in two different ways:

1. By acting as an operating control on the boiler burners, either modulated on/off, high/low fire, or fully modulating fire, depending on the burner construction. When modulating the actual boiler temperature lower, water temperature needs to have a low limit and be maintained above the flue gas condensation temperature for non-condensing type boilers, typically above 140 degrees F. Condensing type boilers can be made to operate at temperatures below the flue gas condensation limit and raise stated efficiencies from the 85% to 95% range.
2. By acting as an operating control on a three-way powered mixing valve or proportional injection pump system that modulates the supply distribution hot water temperature. The mixing valve or mixing pump system recirculates the return water temperature and adds proportionally supply hot water from the boiler for tempering to achieve the desired supply water temperature

E. TEMPERATURE SETBACK

Thermostats typically control building temperature within a relatively narrow band. When the temperature in the room or space moves above or below that band, the thermostat activates the cooling or heating system. Programmable thermostats allow the building operator to vary the building temperature automatically based on the building use. By setting the temperature back during unoccupied periods (referred to as the setback temperature"), summer cooling energy and/or winter heating energy can be reduced.

F. Time of Day Scheduling

All scheduling is performed in automatic mode and is optimized to maximize equipment off times.

G. VAV Conversion

Traditional variable-air-volume (VAV) fan control strategies use a fixed-duct, static-pressure setpoint control that is independent of actual air flow requirements at the terminal units. However, by sensing damper position, the supply fan can be incrementally slowed to maintain one terminal box fully open. The fan can then run as slowly as possible while still keeping all boxes satisfied.

When a facility is only partially used or occupied during the day, the VAV system has a high, part-load operating efficiency. In order to achieve additional energy savings, the VAV system reduces the average ventilation rate in the offices and conference rooms when they are unoccupied.

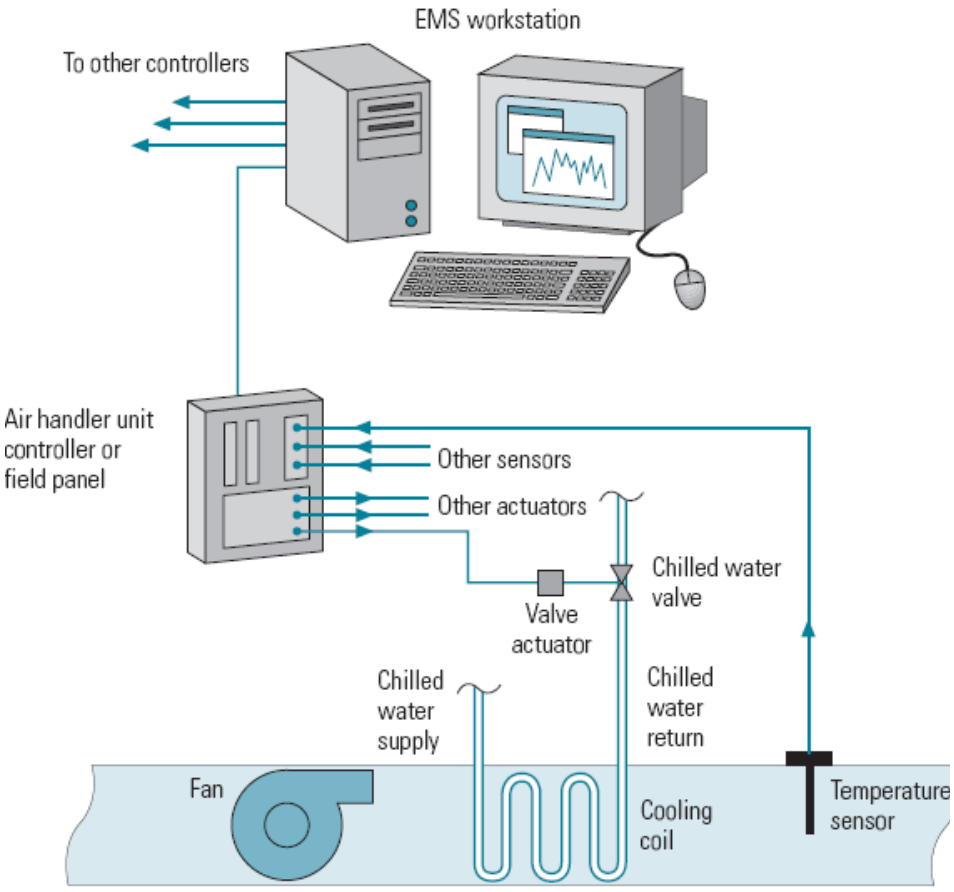
H. Exhaust fan control

The general and toilet exhaust fans will be enabled/disabled by adding points to the EMS system. Exhaust fans serving toilets and general areas will have start/stop/status control, and will be scheduled by time of day scheduling through the BAS.

I. Condenser water reset

Condenser water reset is one of the most cost-effective ways to improve chilled water plant performance because it typically only requires modification of the control logic (at relatively low cost) and can improve chiller performance dramatically. The chiller performance gains are possible by reducing the condenser water supply (CWST) with a constant chilled water supply temperature (CHWST). This improvement can be explained simply by recognizing that compressor power is proportional to pressure developed by the compressor, which is in turn directly dependent upon the desired refrigerant temperatures at the inlet and exit of the compressor. These two temperatures are typically combined into a number known as the refrigerant lift. The lower of these temperatures is determined by the CHWST and the higher temperature is dependent upon the CWST. Therefore, if the CWST is reduced for a constant CHWST,

the refrigerant lift, pressure developed by the compressor, and compressor power are all reduced.



Typical EMS consists of sensors, controllers, actuators and software

The EMS has direct digital control (DDC). DDC refers to the application of microprocessor technology to building environmental controls. With DDC it is possible to control heating and cooling functions with software that takes into account a wide range of variables, thereby achieving greater efficiency. DDC is most often used to manage fan systems, controlling the supply and return fan speeds and fan discharge temperature (which may involve four or more DDC sequences for the various dampers and heating/cooling coils). Some systems require humidity and/or exhaust fan control, as well as energy recovery (using

the available heating/cooling from the exhaust air to heat/cool the outside air that is being drawn into the building by the supply fans).

DDC also controls most chillers, some outside and inside lights, most hot water and chilled water pumps, and some cooling tower fans. There are many benefits to using DDC. First, it is possible to develop historical records on the operating characteristics of a building: identifying trends which can lead to better performance. The DDC system also allows for comprehensive alarm management in the event of a mechanical system malfunction.

DDC saves time by eliminating the need to change various time clocks for holidays and schedule changes. In addition, DDC has replaced pneumatic controllers that tend to drift out of calibration and suffer from "offset" (i.e., the pneumatic controllers don't have the ability to maintain the temperature at setpoint under changing load conditions).

Scope of Work

SIEMENS will install Apogee™, an Energy Management System (EMS) at the Gainesville Police Department. The operation of the boilers, chillers, cooling towers, air handling units and lighting will be programmed into the system for better control optimization at various loads in the building.

Boilers

- The boiler will be tied to the EMS system which will be programmed to provide a hot water reset. The controllers will adjust or "reset" the system water temperature as the outdoor temperature changes.
- SIEMENS will calibrate the hot water reset temperature controller for space heating boilers to ensure the system temperature is just hot enough to meet the space heating needs of the building.

Chillers

- The chillers will be tied to the EMS system and will include start/stop points, status and alarm; and chilled and condenser water reset.

Cooling Towers

- Two VFDs will be installed inside the mechanical room and wired properly to the cooling tower fans. The drives will include

LAN connections in each drive and will be interfaced to the EMS system.

VAV

- Siemens will provide new static pressure sensors in the duct work, two-thirds down the duct for static pressure control.
- Outdoor air dampers will be controlled on signals originating from CO2 or enthalpy to vary the outdoor air amount entering the facility.

INTEGRATION WITH EXISTING SYSTEMS AND OPERATIONS

Impact on Facility Performance, Operations and Maintenance

To maintain comfortable conditions in buildings, energy management systems control HVAC equipment operation (when the equipment starts and stops) and its running capacity (such as fan speed and supply air temperature). The installation of this system will enable much better control of comfort and energy consumption at the facility.

Maintenance of the EMS should be done according to manufacturer's specifications. Periodic calibration and preventative maintenance will be necessary (as it is for all control systems including those currently installed).

Special Operating Requirements

Some regular maintenance and calibration will be required throughout the life of the equipment. The control system carries the responsibility for making sure that equipment and systems are properly integrated and functioning as a whole.

EQUIPMENT INFORMATION

Manufacturer and Type

Manufacturer - We expect to install the EMS from but not limited to the following manufacturers:

SIEMENS • 8940 Western Way • Jacksonville, FL 32256 • 904-464-0808

COMMISSIONING PROCEDURE

Commissioning will be done on the added points to the EMS. Point-to-point integrity will be verified, signal function checked, the sensors calibration will be verified, and a report will be generated.

Proper operation of all sequences will be verified as functional including:

- chilled water reset
- chiller operational sequencing
- temperature set back (zone temperature)
- hot water reset
- enthalpy operations
- condenser water reset
- VFD operations
- CO2 damper modulation
- exhaust fan operation
- initial temperature set points
- initial equipment run time scheduling
- proper operation of VAV system components

ENVIRONMENTAL ISSUES

No environmental impacts are expected.

MEASUREMENT AND VERIFICATION

For this FIM, SIEMENS will use the Option C (whole building analysis) approach to Measurement & Verification. This method will be described in detail in a subsequent section of this Technical Audit.

TRAINING

The Gainesville Police Department maintenance staff will be provided with, at minimum, a comprehensive, hands-on training session on the EMS controls. The session will be provided by the controls manufacturer's representative and will be conducted at the Facilities Plant using the actual controls components.

SIEMENS

Calculations for FIM 6: EMS Upgrades
EMS Upgrades Savings Calculations

CRITICAL ASSUMPTIONS

Assumptions

Demand Control Ventilation
AHU 2, 5 and 6 currently bring in 100% outside air regardless of occupancy. A CO2-based DCV system utilizes an air quality sensor (carbon dioxide) to determine the occupancy level for the building space. If there is one person in the space, the outdoor dampers can cut down on the amount of outside air being brought in. Obviously, if there are more people in a space, the system brings in more outside air. This system can save energy for the building as well as improve indoor air quality in the building by bringing in outside air when it is needed by the occupants.

Chilled Water Reset
There is currently no reset being utilized. A 6°F chilled water reset will be applied.

Enthalpy Economizer
SIEMENS will use outside air to cool the building whenever the outside air has a lower total heat content (enthalpy) than the return air. Outside enthalpy conditions below the return air conditions (24 Btu/lb) can be used to cool the building. The OA temperature for start of cooling will be 50°F and for heating will be 49°F.

Hot Water Reset
A 20°F hot water reset will be programmed into the EMS system. The boiler will operate from 180°F to 160°F. Water returned to the water heater inlet must not be less than 125°F or excessive condensation of the products of combustion will damage the water heater.

Temperature Setback
Reset unoccupied space temperature setpoint up in summer and down in winter. The summer occupied/unoccupied space temperature will be 74°F/80°F and the winter occupied/unoccupied space temperature will be 72°F/55°F.

Time of day Scheduling
AHU 1, 3 and 4 will be scheduled to meet occupancy needs.

VAV
The existing supply fan system is constant volume. Static pressure will be reset in times of low load.

Exhaust Fan Control
The EMS system will enable/disable exhaust fans in toilets which are currently running all the time (24/7). The general building exhaust will remain running to maintain the building positive pressure.

SIEMENS BUILDING TECHNOLOGIES, Inc.

PROJECT: Gainesville Police Department
SUBJECT: Information Sheet

Facility Name:	Gainesville Police Department	
Facility Square Footage	54,287	sq ft
HEATING LOADS		
Assumed heating load per sqft	28	Btu/hr/sqft
Building peak heating load	1,530,900	Btu/hr
Ventilation Peak load	0	Btu/hr
HEATING EQUIPMENT		
Heating System Efficiency	85%	
COOLING LOADS		
Assumed cooling load per sqft	51	Btu/hr/sqft
Building peak cooling load	2,760,000	Btu/hr
Ventilation peak Load	0	Btu/hr
COOLING EQUIPMENT		
Chiller Efficiency	0.95	kW/ton
Primary heating fuel	g	G, O, S, or E
Primary cooling Fuel	e	G, O, S, or E
Minimum OA	-	cfm

Current Operating Schedule
Continuous - 24/7

12am-8am	8am-4pm	4pm-12am	Days/Week
8.0	8.0	8.0	7.0
0.0		12.0	0.0
		am,	

Proposed Operating Schedule
5am to 10pm, 7 days/week

12am-8am	8am-4pm	4pm-12am	Days/Week
3.0	8.0	6.0	7.0
5.0		10.0	0.0
		pm,	

SPACE TEMPERATURES		
Cooling Design Temp.	93	F
Heating Design Temp.	16	F
Outdoor Balance Point	55	F
Occupied Heating Setpoint	72	F
Unoccupied Htg. Setpoint	55	F
Occupied Cooling Setpoint	74	F
Unoccupied Clg. Setpoint	80	F
Ave Btu/CFM OA. - Peak Cl.	51	Btu/cfm
Ave Btu/CFM OA. - Peak Ht.	28	Btu/cfm

ANNUAL WEATHER DATA

Outdoor Air Bin Temp F	Annual Bin Hours 12am-8am	Annual Bin Hours 8am-4pm	Annual Bin Hours 4pm-12am	Mean Coincident WB	Enthalpy
A	B	C	D	D'	
Data Compiled for Gainesville, FL					
104		0	0	77	42
99		19	2	78	41
94	0	227	37	76	39
89	1	478	117	75	37
84	30	534	262	73	36
79	262	462	566	71	33
74	731	357	591	69	29
69	452	262	387	63	26
64	355	196	302	59	23
59	301	148	224	54	20
54	239	104	168	49	17
49	190	69	123	44	15
44	151	36	82	40	13
39	109	17	40	35	11
34	69	6	16	30	9
29	25	2	4	26	7
24	4	1	1	20	6
19	2	0	0	16	
14	0	0		10	
9					
4					
-1					
-6					
-11					
-16					
	2,921	2,918	2,922		

Basis For Proposed Schedule		hrs
12am-8am	30 % Occupancy	2.4
8am-4pm	100% Occupancy	8
4pm-12am	50% Occupancy	4

Title **Carbon Dioxide Sensor Retrofit to control Outside Air Quantity based on Occupancy**
Project **Gainesville Police Department**
Site **Gainesville**

Description The savings for the carbon monoxide system for the building areas are calculated based on the actual cfm, % outside air, HP, heating and cooling capacities.

Given

Electric Energy Costs (kWh Cost)	$ 0.0650	$/kWh	(From Rate Schedules)
Heating Cost (Htg Cost)	$1.39	$/Therms	(From Rate Schedules)
WEEKLY HOURS OF OPERATION	168	hrs	(From Operating Schedule and bins)
% OUTSIDE AIR	100%		(From Schedule below)
SUPPLY FAN CFM	12,585	cfm	(From Schedule below)
Reduction of Outside air	87%		(Calculated from Schedule below)

AHU Schedule from drawings and survey.

AHU	Service	CFM	HP	htg (mbh)	clg (mbh)	min. OA	min. OA	% occupancy Resultant (From Below)	new min. OA (Min. OA x % Occ.)	
Gainesville Police Dept.										
AHU-1	Offices		0							
AHU-2	Offices	5400	5		506.2	5,400	100%	4%	219	
AHU-3	Offices		0							
AHU-4	Offices		3							
AHU-5	Offices	3335	5		116.2	3,335	100%	43%	1,430	
AHU-6	Offices	3850	5		99.7	3,850	100%	0%	-	
Subtotal		12585	18	0	722.1	12,585	100%		1649	13.1%

Notes

AHU 2,5 and 6 have variable pitch drives
AHU 1 and 3 have eddy current drives
AHU 4 is factory furnished

Assumptions:

COOLING SEASON	34	wks	(From Operating Schedule)
HEATING SEASON	18	wks	(From Operating Schedule)
BOILER EFF.	85%		(Assumption)
Cooling Efficiency =	0.53	kw/ton	(Assumption)
DISTRIBUTION EFF.	90%		(Assumption)
Average Space Air Temperature	72	deg F	(Assumption)
Average Space Air Enthalpy	29	btu/# air	(Assumption)
Supply Air Enthalpy (SAH) =	24	btu/# air	(Assumption)

Operating Profile Time		Building Offices % occ.	Building Conference Rooms % occ.	Building Gym % occ.	Building Locker Rooms % occ.	Building Lobby % occ.	
1:00 AM		1%	0%	0%	0%	1%	
2:00 AM		1%	0%	0%	0%	1%	
3:00 AM		1%	0%	0%	0%	1%	
4:00 AM		1%	0%	0%	0%	1%	
5:00 AM		1%	0%	0%	0%	1%	
6:00 AM		1%	0%	0%	0%	5%	
7:00 AM		5%	0%	0%	0%	10%	
8:00 AM		10%	0%	0%	5%	20%	
9:00 AM		20%	0%	0%	5%	50%	
10:00 AM		60%	10%	0%	5%	80%	
11:00 AM		80%	20%	0%	5%	100%	
12:00 PM		100%	20%	0%	0%	100%	
1:00 PM		100%	30%	0%	5%	100%	
2:00 PM		90%	20%	0%	5%	100%	
3:00 PM		80%	10%	0%	5%	50%	
4:00 PM		60%	10%	0%	10%	10%	
5:00 PM		40%	0%	10%	10%	10%	
6:00 PM		20%	0%	10%	10%	10%	
7:00 PM		10%	0%	10%	0%	5%	
8:00 PM		5%	0%	10%	0%	1%	
9:00 PM		5%	0%	10%	0%	1%	
10:00 PM		2%	0%	0%	0%	1%	
11:00 PM		2%	0%	0%	0%	1%	
12:00 PM		1%	0%	0%	0%	1%	
		43%	8%	3%	4%	41%	(Average occupancy for operating hours)
Operating Profile from Design Energy Budgetting Information							
Occupancy		100	30	10	10	10	
schedule		12 am to 11pm	10 am to 4 pm	5 pm to 9 pm	5 pm to 9 pm	12 am to 12 am	

Formula

Mixed Air Temperature (MAT) =	(OA% x (OAT-RAT))-RAT	OAT=Outside Air Temperature, RAT=Return Air Temperature
Mixed Air Enthalpy (MAH) =	(OA% x (OAH-RAH))-RAH	OAH=Outside Air Enthalpy, RAH=Return Air Enthalpy
Temperature Difference (TD or TH) =	(MAT-SAT) or (MAH-SAH)	MAH=Mixed Air Enthalpy, SAH=Supply Air Enthalpy
Ventilation Cooling Load (MBH) =	(4.5 x cfm x Enthalpy Difference x hours/bin x (1 MBH/1000 btu))	[Calculated for each bin]
Ventilation Cooling Energy (kwh) =	(Ventilation Cooling Load x (1 Ton/12 MBH) x Cooling Efficiency)	
Ventilation Cooling Energy Cost =	(Ventilation Cooling Energy) x $/kwh	
Ventilation Heating Load (MBH) =	(1.08 x cfm x (Temperature Difference) x hours/bin x (1 MBH/1000 btu))	[Calculated for each bin]
Ventilation Heating Energy (MCF) =	(Ventilation Heating Load x (1 MCF/1,000 MBH) x (1/Boiler Efficiency) x (1/Distribution Efficiency))	
Ventilation Energy Savings =	(Original Ventilation Energy) - (Proposed Ventilation Energy)	
Ventilation Energy Savings Cost =	(Original Ventilation Energy Cost) - (Proposed Ventilation Energy Cost)	

Demand Control Ventilation REV2003

Calculations Sample for chart below

Mixed Air Temperature (Top Bin) =	((	**% OA**	100%	) x (	**OA Temp.**	97.5	-	**RA Temp.**	72	))+ (	**RA Temp.**	72	)	=	**97.50** F
Mixed Air Enthalpy (Top Bin) =	((	**% OA**	100%	) x (	**OA Temp.**	87.5	-	**RA Temp.**	72	))+ (	**RA Temp.**	72	)	=	**87.50** F
Temperature Difference (Top Bin) =	((	**MAH**	41.9	) - (	**SAH**	24	)=								**17.90** F
Ventilation Cooling Load (Top Bin) =	(	**Conversion Factor**	4.5	) x (	**cfm**	12,585	) x (	**Enthalpy Difference**	17.90	) x (	**Hours/Bin**	42	) / (	**Conversion** 1,000) =	**42,576** MBH
Ventilation Cooling Energy (Total) =	(	**Vent. Clg. Load**	3,035,864	) / (	**Ton/MBH**	12	) x (	**Cooling Efficiency**	0.53	)=					**134,084** kwh
Ventilation Cooling Energy Cost (Total) =	(	**Vent. Clg. Energy**	134,084	) x (	**$/kwh**	$ 0.0650	) =								**$ 8,715**
Ventilation Cooling Energy Savings =	(	**Vent. Clg. Energy**	134,084	) - (	**Vent. Clg. Energy**	68,138	) =								**65,946** kwh
Ventilation Cooling Energy Cost Savings =	(	**Vent. Clg. Energy Savings**	65,946	) x (	**$/kwh**	$ 0.0650	) =								**$ 4,287**
Ventilation Heating Load (Bottom Bin) =	(	**Conversion Factor**	1.08		**cfm**	12,585		**Temperature Difference**	9.0.00	) x (	**Hours/Bin**	0	) / (	**Conversion** 1,000) =	**-** MBH
Ventilation Heating Energy (Total) =	(	**Vent. Htg. Load**	498,955	) / (	**Conversion**	1,000	) / (	**Boiler Eff.**	85%	) / (	**Distribution Eff.**	90%	) =		**652** MCF
Ventilation Heating Energy Cost (Total) =	(	**Vent. Htg. Energy**	652	) x (	**$/MCF**	$ 1.3900	) =								**$ 907**
Ventilation Heating Energy Savings =	(	**Vent. Htg. Energy**	652	) - (	**Vent. Htg. Energy**	54	) =								**598** MCF
Ventilation Heating Energy Cost Savings =	(	**Vent. Htg. Energy Savings**	598	) x (	**$/MCF**	$ 1.3900	) =								**$ 831**

Operation	OA Enthalpy	RA Temp	OA Temp	Orig. MAT	Orig. MAH	SA	TD or HD	Constant	CFM	Hours	Conversion	MBH Htg. Load		MBH Clg. Load	
Cooling	41.9	72	97.5	97.50	41.9	55	17.90	(4.5)*(	12,585)*(	42	)/(1000 btu/mbh) =	-		42,576	
Cooling	40.5	72	92.5	92.50	40.5	55	16.50	(4.5)*(	12,585)*(	206	)/(1000 btu/mbh) =	-		192,494	
Cooling	39	72	87.5	87.50	39.0	55	15.00	(4.5)*(	12,585)*(	481	)/(1000 btu/mbh) =	-		408,603	
Cooling	36.9	72	82.5	82.50	36.9	55	12.90	(4.5)*(	12,585)*(	995	)/(1000 btu/mbh) =	-		726,906	
Cooling	35.5	72	77.5	77.50	35.5	55	11.50	(4.5)*(	12,585)*(	1401	)/(1000 btu/mbh) =	-		912,435	
Cooling	32.7	72	72.5	72.50	32.7	55	8.70	(4.5)*(	12,585)*(	1528	)/(1000 btu/mbh) =	-		752,850	
Economizer	28.8	72	67.5	67.50	0.0	60	(7.50)	(1.08)*(	-)*(	706	)/(1000 btu/mbh) =	-		-	
Economizer	25.6	72	62.5	62.50	0.0	60	(2.50)	(1.08)*(	-)*(	977	)/(1000 btu/mbh) =	-		-	
Heating	22.5	72	57.5	57.50	0.0	60	2.50	(1.08)*(	12,585)*(	728	)/(1000 btu/mbh) =	24,737		-	
Heating	19.9	72	52.5	52.50	0.0	60	7.50	(1.08)*(	12,585)*(	654	)/(1000 btu/mbh) =	66,668		-	
Heating	17.3	72	47.5	47.50	0.0	70	22.50	(1.08)*(	12,585)*(	445	)/(1000 btu/mbh) =	136,088		-	
Heating	14.9	72	42.5	42.50	0.0	70	27.50	(1.08)*(	12,585)*(	242	)/(1000 btu/mbh) =	90,453		-	
Heating	12.9	72	37.5	37.50	0.0	70	32.50	(1.08)*(	12,585)*(	254	)/(1000 btu/mbh) =	112,200		-	
Heating	10.9	72	32.5	32.50	0.0	80	47.50	(1.08)*(	12,585)*(	79	)/(1000 btu/mbh) =	51,003		-	
Heating	8.7	72	27.5	27.50	0.0	80	52.50	(1.08)*(	12,585)*(	9	)/(1000 btu/mbh) =	6,422		-	
Heating	6.5	72	22.5	22.50	0.0	80	57.50	(1.08)*(	12,585)*(	7	)/(1000 btu/mbh) =	5,471		-	
Heating	5.5	72	17.5	17.50	0.0	90	72.50	(1.08)*(	12,585)*(	6	)/(1000 btu/mbh) =	5,912		-	
Heating		72		-	0.0	90	90.00	(1.08)*(	12,585)*(	0	)/(1000 btu/mbh) =	-		-	
Subtotal =										**8760**	Hours	**498,955**	MBH	**3,035,864**	MBH
												652	MCF	**134,084**	kwh

Operation	OA Enthalpy	RA Temp	OA Temp	Prop. MAT	Orig. MAH	SA	TD or HD	Constant	CFM	Hours	Conversion	MBH Htg. Usage		MBH Clg. Usage	
Cooling	41.9	72	97.5	75.34	30.7	55	6.69	(4.5)*(	12,585)*(	42	)/(1000 btu/mbh) =	-		15,914	
Cooling	40.5	72	92.5	74.69	30.5	55	6.51	(4.5)*(	12,585)*(	206	)/(1000 btu/mbh) =	-		75,913	
Cooling	39	72	87.5	74.03	30.3	55	6.31	(4.5)*(	12,585)*(	481	)/(1000 btu/mbh) =	-		171,899	
Cooling	36.9	72	82.5	73.38	30.0	55	6.04	(4.5)*(	12,585)*(	995	)/(1000 btu/mbh) =	-		340,085	
Cooling	35.5	72	77.5	72.72	29.9	55	5.85	(4.5)*(	12,585)*(	1401	)/(1000 btu/mbh) =	-		464,296	
Cooling	32.7	72	72.5	72.07	29.5	55	5.48	(4.5)*(	12,585)*(	1528	)/(1000 btu/mbh) =	-		474,631	
Economizer	28.8	72	67.5	71.41	0.0	60	(11.41)	(1.08)*(	-)*(	706	)/(1000 btu/mbh) =	-		-	
Economizer	25.6	72	62.5	70.76	0.0	60	(10.76)	(1.08)*(	-)*(	977	)/(1000 btu/mbh) =	-		-	
Economizer	22.5	72	57.5	70.10	0.0	60	(10.10)	(1.08)*(	-)*(	728	)/(1000 btu/mbh) =	-		-	
Economizer	19.9	72	52.5	69.44	0.0	60	(9.44)	(1.08)*(	-)*(	654	)/(1000 btu/mbh) =	-		-	
Heating	17.3	72	47.5	68.79	0.0	70	1.21	(1.08)*(	12,585)*(	445	)/(1000 btu/mbh) =	7,323		-	
Heating	14.9	72	42.5	68.13	0.0	70	1.87	(1.08)*(	12,585)*(	242	)/(1000 btu/mbh) =	6,138		-	
Heating	12.9	72	37.5	67.48	0.0	70	2.52	(1.08)*(	12,585)*(	254	)/(1000 btu/mbh) =	8,704		-	
Heating	10.9	72	32.5	66.82	0.0	80	13.18	(1.08)*(	12,585)*(	79	)/(1000 btu/mbh) =	14,148		-	
Heating	8.7	72	27.5	66.17	0.0	80	13.83	(1.08)*(	12,585)*(	9	)/(1000 btu/mbh) =	1,692		-	
Heating	6.5	72	22.5	65.51	0.0	80	14.49	(1.08)*(	12,585)*(	7	)/(1000 btu/mbh) =	1,378		-	
Heating	5.5	72	17.5	64.86	0.0	90	25.14	(1.08)*(	12,585)*(	6	)/(1000 btu/mbh) =	2,050		-	
Heating	0	72	0	62.56	0.0	90	27.44	(1.08)*(	12,585)*(	0	)/(1000 btu/mbh) =	-		-	
Subtotal =										**8760**	Hours	**41,433**	MBH	**1,542,738**	MBH
												54	MCF	**68,138**	kwh

EXISTING VENTILATION COOLING ENERGY	**134,084**	**kwh**	**$ 8,715**
EXISTING VENTILATION HEATING ENERGY	**6,522**	**Therms**	**$ 9,066**
EXISTING VENTILATION ENERGY COST			**$ 17,781**

PROPOSED VENTILATION COOLING ENERGY	**68,138**	**kwh**	**$ 4,429**
PROPOSED VENTILATION HEATING ENERGY	**542**	**Therms**	**$ 753**
PROPOSED VENTILATION ENERGY COST			**$ 5,182**

SAVINGS AT 100% GUARANTEE

VENTILATION COOLING ENERGY SAVINGS	**65,946**	**kwh**	**$ 4,287**	**49.2% of existing**
VENTILATION HEATING ENERGY SAVINGS	**5,981**	**Therms**	**$ 8,313**	**91.7% of existing**
VENTILATION ENERGY COST SAVINGS			**$ 12,600**	**70.9% of existing**

SAVINGS AT 80% GUARANTEE

VENTILATION COOLING ENERGY SAVINGS	**52,757**	**kwh**	**$ 3,429**	**39.3% of existing**
VENTILATION HEATING ENERGY SAVINGS	**4,785**	**Therms**	**$ 6,651**	**73.4% of existing**
VENTILATION ENERGY COST SAVINGS			**$ 10,080**	**56.7% of existing**

Comments: The AHU capacities were taken from the construction drawings. The hours of operation was reviewed with the operators and trending for verification.

Formula Outdoor Air % = ((RAT-MAT)/(RAT-OAT)*100)

Calculated % outside air from readings and survey.

AHU	Service	CFM	RA Temp	MA Temp	OA Temp	Calc. OA	Calc. OA %
Gainesville Police Dept.							
AHU-1	Offices	0					
AHU-2	Offices	5400	69	55	33.52	2,131	39%
AHU-3	Offices	0					
AHU-4	Offices	0					
AHU-5	Offices	3335	70	55.2	34.25	1,381	41%
AHU-6	Offices	3850	70	55.2	34.25	1,594	41%
Subtotal		12585				5,105	41%

Title **Chilled Water Reset**
Project **Gainesville Police Department**
Site **Gainesville**

Description A chilled water reset program will be initiated to increase the chilled water supply temperature when demand for cooling is low. The calculation is bassed on reduced chiller consumption due to reduced lift (reset temperature) over the operation.

Given

Electric Energy Costs	$0.05	$/kWh
Chiller Peak Load	230	tons

Assumptions

Chiller Efficiency	0.53	kW/ton
Chilled Water Reset	6	deg F
Reset Factor	0.0017	
OA Temperature Chiller Initiates	55	deg F
Minimum Chiller Load	20	tons

Reset Factors: Centrifugal = 0.0017; Screw = 0.023; Reciprocating = 0.011; Absorption = 0.005

Formula

Building Load = (Chiller Peak Load) x ((Actual OA Temp. - Initiate OA Temp.) / (Design OA Temp. - Initiate OA Temp.))
Chiller Load = Building Load if above Minimum, otherwise it is Minimum
Energy Use = (Chiller Load) x (Chiller Efficiency) x (Hours/Bin)
Reset Potential = ((Chiller Peak Load-Chiller Load)/(Chiller Peak Load))
Reset Temperature = (Reset Potential) x (Chilled Water Reset)
Energy Savings = (Chiller Load) x (Chiller Efficiency) x (Hours/Bin) x (Degrees Reset) x (Reset Factor)
Energy Cost = (Energy) x (Cost/Unit)

See bins below for samples of calculation in chart.

Building Load = (Chiller Peak Load) x ((Actual OA Temp. - Initiate OA Temp.) / (Design OA Temp. - Initiate OA Temp.))
Building Load = (230) x((97.5 - 55) / (97.5 - 55) = **230 Tons**

Energy Use = (Chiller Load) x (Chiller Efficiency) x (Hours/Bin)
Energy Use = (230) x (0.5) x (42) = **5119.8 kwh**

Reset Potential = ((Chiller Peak Load-Chiller Load)/(Chiller Peak Load))
Reset Potential = ((230 - 202.9)/(230)) = **12%**

Reset Temperature = (Reset Potential) x (Chilled Water Reset)
Reset Temperature = (12%) x (6.0) = **1 Deg. F**

Energy Savings = (Chiller Load) x (Chiller Efficiency) x (Hours/Bin) x (Degrees Reset) x (Reset Factor)
Energy Savings = (203) x (0.5) x (206) x (1) x (0.0017) = **27 kwh**

Calculation

Operation	OA Temp	Hours	Building Load	Chiller Load	Energy Use	Reset Potential	Reset F	Energy Savings
Cooling	97.5	42	230	230	5,120	0%	0	0
Cooling	92.5	206	203	203	22,157	12%	1	27
Cooling	87.5	481	176	176	44,838	24%	1	108
Cooling	82.5	995	149	149	78,482	35%	2	283
Cooling	77.5	1401	122	122	90,414	47%	3	434
Cooling	72.5	1528	95	95	76,697	59%	4	460
Cooling	67.5	706	68	68	25,312	71%	4	182
Cooling	62.5	977	41	41	21,017	82%	5	177
Cooling	57.5	728	14	20	7,717	94%	6	74
Heating	52.5	654	0	0	-	0%	0	0
Heating	47.5	445	0	0	-	0%	0	0
Heating	42.5	242	0	0	-	0%	0	0
Heating	37.5	254	0	0	-	0%	0	0
Heating	32.5	79	0	0	-	0%	0	0
Heating	27.5	9	0	0	-	0%	0	0
Heating	22.5	7	0	0	-	0%	0	0
Heating	17.5	6	0	0	-	0%	0	0
Heating			0	0	-	0%	0	0
Heating			0	0	-	0%	0	0
Heating			0	0	-	0%	0	0
Subtotal =		**8760 Hours**			**371,753 kwh**			**1,744 kwh**

Existing Energy Cost = (Energy Use) x (Cost/Unit)
Existing Energy Cost = (371,753) x ($0.05) = **$ 18,588**

Energy Cost Savings = (Energy Savings) x (Cost/Unit)
Energy Cost Savings = (1,744) x ($0.05) = **$ 87**

Result

EXISTING COOLING ENERGY	**371,753 kwh**	**$ 18,588**	
PROPOSED COOLING ENERGY	**370,009 kwh**	**$ 18,500**	
SAVINGS AT	**100% GUARANTEE**		
COOLING ENERGY SAVINGS	**1,744 kwh**	**$ 87**	**0.47% of existing**
SAVINGS AT	**80% GUARANTEE**		
COOLING ENERGY SAVINGS	**1,395 kwh**	**$ 70**	**0.38% of existing**

Comments

SIEMENS BUILDING TECHNOLOGIES, Inc.

PROJECT: Gainesville Police Department

SUBJECT: Condenser Water Reset

Facility Name:	Gainesville Police Department	
Present Full Load (tons)	230	AA
Chiller power input rate @ 44/85	0.950	BB
Electricity Unit Cost ($/kWh):	$0.0650	CC
Electricity Demand Cost ($/kW):	$6.3300	CD
Steam Unit Cost ($/therm):		DD

Design Temperatures	
Outdoor Temp at Heating Design:	16 F (LL)
Outdoor Temp at Cooling Design:	93 F (MM)
Outdoor Temp at Zero Load:	55 F (NN)

0

Power savings rate per degree of CDW reset, centrifugal chiller = 0.4

Proposed Operating Schedule 5am to 10pm, 7 days/week			
12am-8am	8am-4pm	4pm-12am	Days/Week
3.0	8.0	6.0	7.0
JJ	KK	LL	MM

Outdoor Air Bin Temp F	Annual Bin Hours 12am-8am	Annual Bin Hours 8am-4pm	Annual Bin Hours 4pm-12am	Mean Coincident WB	Operating Bin Hours 12am-8am	Operating Bin Hours 8am-4pm	Operating Bin Hours 4pm-12am	Total Operating Bin Hours	Cooling Load (%)	CDW Temp present (F)	Cooling Load (tons)	Chiller power kW/ton	Existing Electric Use kWh	CDW Temp proposed (F)	Chiller power kW/ton	Proposed Electric Use kWh	Total Saved kWh	Electric Demand Saved (kW)	Total Cost Savings
A	B	C	D	D'	E = BxJJxMM / 8 7	F = CxKKxMM / 8 7	G = DxLLxMM / 8 7	H = E+F+G	J see VFD calcs	K constant	L = AA x J	M = BB	N = H x L x M	P = D' + 3	Q = BB x 1 + (B5 - P) / 100 x 0.4	R = H x L X Q	S = N - R	T = S / H No ratchet Saved	U = S x CC
Data Compiled for Gainesville, FL																			
104	0	0	0	77	0	0	0	0	129%	85	297	0.950	0	80	0.931	0	**0**		**$0**
99	0	19	2	78	0	19	2	21	116%	85	266	0.950	5,187	81	0.933	5,093	**93**		**$6**
94	0	227	37	76	0	227	28	255	103%	85	236	0.950	57,128	79	0.929	55,848	**1,280**		**$83**
89	1	478	117	75	0	478	88	566	89%	85	206	0.950	110,677	78	0.923	107,534	**3,143**		**$204**
84	30	534	262	73	11	534	197	742	76%	85	176	0.950	123,687	76	0.915	119,086	**4,601**		**$299**
79	262	462	566	71	98	462	425	985	63%	85	145	0.950	135,896	74	0.909	130,025	**5,871**	**6.0**	**$382**
74	731	357	591	69	274	357	443	1,074	50%	85	115	0.950	117,375	72	0.900	111,178	**6,197**	**5.8**	**$403**
69	452	262	387	63	170	262	290	722	37%	85	85	0.950	58,101	66	0.879	53,778	**4,323**	**6.0**	**$281**
64	355	196	302	59	133	196	227	556	24%	85	54	0.950	28,754	62	0.861	26,074	**2,680**	**4.8**	**$174**
59	301	148	224	54	113	148	168	429	11%	85	24	0.950	9,864	57	0.843	8,751	**1,113**	**2.6**	**$72**
54	239	104	168	49	90	104	126	320	0%	0	0	0.000	0	52	0.000	0	**0**	**0.0**	**$0**
49	190	69	123	44	71	69	92	233	0%	0	0	0.000	0	47	0.000	0	**0**	**0.0**	**$0**
44	151	36	82	40	57	36	62	154	0%	0	0	0.000	0	43	0.000	0	**0**	**0.0**	**$0**
39	109	17	40	35	41	17	30	88	0%	0	0	0.000	0	38	0.000	0	**0**	**0.0**	**$0**
34	69	6	16	30	26	6	12	44	0%	0	0	0.000	0	33	0.000	0	**0**	**0.0**	**$0**
29	25	2	4	26	9	2	3	14	0%	0	0	0.000	0	29	0.000	0	**0**		**$0**
24	4	1	1	20	2	1	1	3	0%	0	0	0.000	0	23	0.000	0	**0**		**$0**
19	2	0	0	16	1	0	0	1	0%	0	0	0.000	0	19	0.000	0	**0**		**$0**
14	0	0	0	10	0	0	0	0	0%	0	0	0.000	0	13	0.000	0	**0**		**$0**
9	0	0	0	0	0	0	0	0	0%	0	0	0.000	0	3	0.000	0	**0**		**$0**
4	0	0	0	0	0	0	0	0	0%	0	0	0.000	0	3	0.000	0	**0**		**$0**
-1	0	0	0	0	0	0	0	0	0%	0	0	0.000	0	3	0.000	0	**0**		**$0**
-6	0	0	0	0	0	0	0	0	0%	0	0	0.000	0	3	0.000	0	**0**		**$0**
-11	0	0	0	0	0	0	0	0	0%	0	0	0.000	0	3	0.000	0	**0**		**$0**
-16	0	0	0	0	0	0	0	0	0%	0	0	0.000	0	3	0.000	0	**0**		**$0**
0	0	0	0	0	0	0	0	0	0%	0	0	0.000	0	3	0.000	0	**0**		**$0**
																		T (max)	
	2,921	2,918	2,922		1,095	2,918	2,192	6,205			1,604		646,668			617,367	**29,301**	**6.0**	**$1,905**
																Demand Savings (kW)		**71.9**	
															12	Mo. Demand Savings R(ave)xFG x No. Mo.			**455**
																Total kWh + kW Cost Saved			**$2,359**

Gainesville Police Department
Exhaust Fan Survey

Energy Analysis for Exhaust Fans in EMS Control Due to Reduction in Hours

			Existing			Proposed				
Location	Quantity	Size of Pump (HP)	Annual On hours (hrs)	Annual Usage (kWh)	Annual Cost ($)	Annual On hours (hrs)	Annual Usage (kWh)	Annual Cost ($)	**Electrical Savings due to reduced hrs(kWh)**	**Annual Electrical Cost Savings ($)**
EF-1	1	1/4	8,760	2,178	$141.59	6,188	1,539	$100.02	640	$41.57
EF-2	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-3	1	1/4	8,760	2,178	$141.59	6,188	1,539	$100.02	640	$41.57
EF-4	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-5	1	1	8,760	8,713	$566.36	6,188	6,155	$400.07	2,558	$166.29
EF-6	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-7	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-8	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-9	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-10	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-11	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-12	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
EF-13	1	2	8,760	17,427	$1,132.73	6,188	12,310	$800.15	5,117	$332.58
EF-14	1	1/6	8,760	1,452	$94.39	6,188	1,026	$66.68	426	$27.71
				45,019	**$2,926.21**		**31,801**	**$2,067.05**	**13,218**	**$859.16**

Rates

Electric Usage Cost ($/kWh) **$0.06500**

TITLE: **Enthalpy Economizer**
PROJECT: Gainesville Police Department
SITE: Gainesville

DESCRIPTION: Use outside air to cool the building whenever the outside air has a lower total heat content (enthalpy) than the return air.
Outside enthalpy conditions below the return air conditions (24 btu/#) can be used to cool the building. (Confirm Cooling and Heating Operation).

GIVEN:

Electrical Energy Cost	=		$ 0.0650	/kWh	(From Bill)
Conversion Factor	=		3,413	Btu/Kw	
Conversion Factor	=		12,000	Btu/Ton	

ASSUMPTION:

Air Handling Unit Capacity (Cfm)	=			12,585	cfm	(From Site)
Percent Ventilation Air	=			3.4%		
Cooling Efficiency	=		4.883 COP	0.72	Kw/Ton	
Summer Return Air Temperature	=	50% RH	76 F	30	Enthalpy	Design
Non-Summer Return Air Temperature	=	30% RH	72	24	Enthalpy	Minimum
Wet Bulb-Enthalpy Setpoint	=			23.0	btu/# air	
OA Temperature for start of cooling system =				50	F	
OA Temperature for start of heating system =				49	F	
Cooling Supply Air Temperature (SAT)	=			55	F	(Assumption)
Cooling Supply Air Enthalpy (SAH)	=			23	btu/# air	(Assumption)

FORMULA:

Mixed Air Temperature (MAT) =	(OA% x (OAT-RAT))-RAT OAT=Outside Air Temperature, RAT=Return Air Temperature
Mixed Air Enthalpy (MAH) =	(OA% x (OAH-RAH))-RAH OAH=Outside Air Enthalpy, RAH=Return Air Enthalpy
Cooling Load (MBH) =	(4.5 x cfm x (Mixed Air Enthalpy - Return Air Enthalpy) [Calculated for each bin-hr]
Chiller Load (MBH) =	Same as Cooling load if chiller is on [Calculated for each bin-hr]
Economizer Savings (mbh) =	(4.5 x Return Air CFM x (RA Enthalpy - OA Enthalpy) [Calculated for each bin-hr]
Total Cooling Load (MBH) =	(Cooling Load x hours/bin x (1 MBH/1000 btu)) [Calculated for each bin]
Cooling Energy (kwh) =	(Ventilation Cooling Load x (1 Ton/12 MBH) x Cooling Efficiency)
Return Air Quantity (cfm)=	Air Handling Unit Capacity (Cfm)*(1-Percent Ventilation Air)
Energy Cost =	(Energy) x $/kwh
Energy Savings =	(Original Energy) - (Proposed Energy)
Energy Savings Cost =	(Original Ventilation Energy Cost) - (Proposed Ventilation Energy Cost)
Cost of Cooling ($/MMbh)=	(Electrical Cost ($/Kwh))*(Cooling Efficiency (Kw/Ton)/(12,000 btu/Ton)*(1,000,000 btu/MMbh)

Calculations

Sample for chart below

	% OA		OA Temp.		RA Temp.		RA Temp.	
Mixed Air Temperature = ((	3.4%	) x (	99	-	76	))+ (	76)	= 76.8 F
	% OA		OA Temp.		RA Temp.		RA Temp.	
Mixed Air Enthalpy = ((	3%	) x (	46.1	-	30.0	))+ (	30.0)	= 30.5 F
	Conversion Factor		SA cfm		Mixed Air Enthalpy		Supply Air Enthalpy	
Cooling Load = (	4.5	) x (	12,585	) x (	30.5	-	23) =	427,271 MBH
	Conversion Factor		RA cfm		Return Air Enthalpy		Supply Air Enthalpy	
Economizer Savings (mbh) =(	4.5	) x (	12,159	) x (	20.2	-	31.1) =	(594,300) MBH
	Cooling Load		Hours/Bin		Conversion			
Total Cooling Load = (	427,271	) x (	1	) / (	1,000	) =		427 MBH

REFERENCES: Below are the annual outside temperature bins from Bin Maker Plus (a weather analysis software) Choose data based on drybulb with enthalpy reference based on hours of operation.
When comparing drybulb to enthalpy economizer, drybulb set point must be reduced to operate properly.

CALCULATION:

OA Temp	Constant	RA CFM	RA Enthalpy	OA Enthalpy	Hours	Mixed Air Enthalpy at Min. OA	Bin Cooling Load w/o Economizer	Bin Chiller Load w/o Economizer	Bin Economizer Savings	Wet Bulb Economizer Status	Total Cooling w/o Economizer	Total Cooling with Economizer
99	(4.5)*(	12,159)*(	30.0 -	46.1	1	30.5	427,271	427,271	-	Cooling	427	427
97	(4.5)*(	12,159)*(	27.9 -	42.9	17	28.4	307,197	307,197	-	Cooling	5,222	5,222
95	(4.5)*(	12,159)*(	26.3 -	40.4	24	26.8	213,389	213,389	-	Cooling	5,121	5,121
93	(4.5)*(	12,159)*(	26.2 -	40.2	56	26.6	205,884	205,884	-	Cooling	11,530	11,530
91	(4.5)*(	12,159)*(	26.2 -	40.3	150	26.7	209,637	209,637	-	Cooling	31,445	31,445
89	(4.5)*(	12,159)*(	25.9 -	39.8	194	26.4	190,875	190,875	-	Cooling	37,030	37,030
87	(4.5)*(	12,159)*(	25.1 -	38.6	287	25.6	145,847	145,847	-	Cooling	41,858	41,858
85	(4.5)*(	12,159)*(	24.8 -	38.1	330	25.2	127,086	127,086	-	Cooling	41,938	41,938
83	(4.5)*(	12,159)*(	23.8 -	36.5	318	24.2	67,049	67,049	-	Cooling	21,321	21,321
81	(4.5)*(	12,159)*(	23.6 -	36.3	347	24.1	59,544	59,544	-	Cooling	20,662	20,662
79	(4.5)*(	12,159)*(	23.4 -	35.9	476	23.8	44,535	44,535	-	Cooling	21,198	21,198
77	(4.5)*(	12,159)*(	23.1 -	35.5	262	23.5	29,525	29,525	-	Cooling	7,736	7,736
75	(4.5)*(	12,159)*(	22.6 -	34.7	675	23.0	-	-	-	Cooling	-	-
73	(4.5)*(	12,159)*(	21.7 -	33.3	1004	22.1	-	-	-	Cooling	-	-
71	(4.5)*(	12,159)*(	20.2 -	31.1	512	20.6	-	-	-	Cooling	-	-
69	(4.5)*(	12,159)*(	24.0 -	29.7	361	24.2	67,552	67,552	-	Cooling	24,386	24,386
67	(4.5)*(	12,159)*(	24.0 -	28.1	340	24.1	64,487	64,487	-	Cooling	21,926	21,926
65	(4.5)*(	12,159)*(	24.0 -	26.9	340	24.1	62,188	62,188	-	Cooling	21,144	21,144
63	(4.5)*(	12,159)*(	24.0 -	25.9	317	24.1	60,272	60,272	-	Cooling	19,106	19,106
61	(4.5)*(	12,159)*(	24.0 -	24.4	325	24.0	57,399	57,399	-	Cooling	18,655	18,655
59	(4.5)*(	12,159)*(	24.0 -	23.3	130	24.0	55,291	55,291	-	Cooling	7,188	7,188
57	(4.5)*(	12,159)*(	24.0 -	22.5	300	23.9	53,759	53,759	53,759	Economizer	16,128	(0)
55	(4.5)*(	12,159)*(	24.0 -	21.4	442	23.9	51,652	51,652	51,652	Economizer	22,830	0
53	(4.5)*(	12,159)*(	24.0 -	20.3	261	23.9	49,544	49,544	49,544	Economizer	12,931	-
51	(4.5)*(	12,159)*(	24.0 -	19	249	23.8	47,054	47,054	47,054	Economizer	11,716	-
49	(4.5)*(	12,159)*(	24.0 -	18.1	227	23.8	45,330	-	-	Heating	-	-
47	(4.5)*(	12,159)*(	24.0 -	16.9	147	23.8	43,031	-	-	Heating	-	-
45	(4.5)*(	12,159)*(	24.0 -	15.9	132	23.7	41,115	-	-	Heating	-	-
43	(4.5)*(	12,159)*(	24.0 -	15	122	23.7	39,391	-	-	Heating	-	-
41	(4.5)*(	12,159)*(	24.0 -	14.3	59	23.7	38,050	-	-	Heating	-	-
39	(4.5)*(	12,159)*(	24.0 -	13.5	89	23.6	36,517	-	-	Heating	-	-
37	(4.5)*(	12,159)*(	24.0 -	12.7	138	23.6	34,985	-	-	Heating	-	-
35	(4.5)*(	12,159)*(	24.0 -	11.8	48	23.6	33,260	-	-	Heating	-	-
33	(4.5)*(	12,159)*(	24.0	11.1	33	23.6	31,919	-	-	Heating	-	-
31	(4.5)*(	12,159)*(	24.0	10.2	25	23.5	30,195	-	-	Heating	-	-
29	(4.5)*(	12,159)*(	24.0	9.2	8	23.5	28,279	-	-	Heating	-	-
27	(4.5)*(	12,159)*(	24.0	7.6	1	23.4	25,214	-	-	Heating	-	-
25	(4.5)*(	12,159)*(	24.0 -	7.1	3	23.4	24,256	-	-	Heating	-	-
23	(4.5)*(	12,159)*(	24.0 -	6.5	2	23.4	23,107	-	-	Heating	-	-
21	(4.5)*(	12,159)*(	24.0 -	6.2	2	23.4	22,532	-	-	Heating	-	-
19	(4.5)*(	12,159)*(	24.0 -	5.9	6	23.4	21,957	-	-	Heating	-	-
	(4.5)*(	12,159)*(	24.0 -			23.2	10,655	-	-	Heating	-	-
	(4.5)*(	12,159)*(	24.0 -			23.2	10,655	-	-	Heating	-	-
	(4.5)*(	12,159)*(	24.0 -			23.2	10,655	-	-	Heating	-	-
	(4.5)*(	12,159)*(	24.0 -			23.2	10,655	-	-	Heating	-	-
	(4.5)*(	12,159)*(	24.0 -			23.2	10,655	-	-	Heating	-	-
	(4.5)*(	12,159)*(	24.0 -			23.2	10,655	-	-	Heating	-	-
RESULT:	Subtotal =				8760		**2,232,246**	**1,649,180**	**202,008**		**410,728**	**347,123**

	Mbh		BTU/Ton		Kw/Ton		Mbh/MMBH		
Existing =	(410,728	) / (	12,000	) x (	0.72	) x (	1000	) =	**24,644 kwh**
	Mbh		BTU/Ton		Kw/Ton		Mbh/MMBH		
New =	(347,123	) / (	12,000	) x (	0.72	) x (	1000	) =	**20,827 kwh**
	kwh		$/kwh						
Existing =	(24,644	) x ($	0.065	) =					**$ 1,602**
	kwh		$/kwh						
New =	(20,827	) x ($	0.065	) =					**$ 1,354**

Result

	Annual Existing Costs (kWh)	**24,644**	**kWh/yr**	**$1,602**	
	Annual Existing Costs $			**$1,602**	
	Annual New Costs (kWh)	**20,827**	**kWh/yr**	**$1,354**	
	Annual New Costs $			**$1,354**	
100%	**Annual Savings (kWh)**	**3,816**	**kWh/yr**	**$248**	
	Total Savings $			**$248**	**15.5% of existing**
80%	**Annual Savings (kWh)**	**3,053**	**kWh/yr**	**$198**	
	Total Savings $			**$198**	**12.4% of existing**

COMMENTS:

Formula Outdoor Air % = ((RAT-MAT)/(RAT-OAT)*100)

Calculated % outside air from readings and survey.

AHU	Service	CFM	RA Temp	MA Temp	OA Temp	Calc. OA	Calc. OA %
AHU-1	Office	12,585	72.0	70.7	33.57	426	3.4%

Title **Hot Water Reset**
Project **Gainesville Police Department**
Site **Gainesville**

Description A hot water reset program will be initiated to decrease the hot water supply temperature when demand for heating is low. The calculatior is based on reduced boiler consumption.

Given

Energy Fuel Cost	$1.39	$/Therm (Nat'l Gas)
Boiler Plant Peak Load	1,500,000	btu/hr

Assumptions

Boiler Efficiency	85%	
Design Hot Water Supply Temperature	180	deg F
Design Indoor Air Temperature	75	deg F
Hot Water Reset	20	deg F
Reset Factor	0.08	
OA Temperature Boiler Initiates	50	deg F
Minimum Boiler Load	500,000	btu/hr

Formula

Hot Water Supply Temp @ OA Bin = Design IA Temp + (Design HWS Temp - Design IA Temp)/(Design IA Temp - Design OA Temp) x (Design IA Temp - Actual OATemp)
Building Load = (Boiler Plant Peak Load) x ((Actual OA Temp. - Initiate OA Temp.) / (Design OA Temp. - Initiate OA Temp.))
Boiler Load = Building Load if above Minimum, otherwise it is Minimum
Energy Use = ((Boiler Load) / (Boiler Efficiency)) x (Hours/Bin)
Reset Potential = ((Boiler Peak Load - Boiler Load)/(Boiler Peak Load))
Reset Temperature = (Reset Potential) x (Hot Water Reset)
Energy Savings = ((Energy Use) x (Hours/Bin) x (Reset Factor) / 1,000,000 btu/mmbtu
Energy Cost = (Energy) x (Fossil Fuel Cost)

See bins below for samples of calculation in chart.

Building Load =	Boiler Peak Load		Actual OA Temp.		Initiate OA Temp.		Design OA Temp.		Initiate OA Temp.		
Building Load =	(1,500,000	) x((	0	-	50	) / (	0	-	50	) =	**1,500,000 btu**

Energy Use =	Boiler Load		Boiler Efficiency		Hours/Bin		Conversion		
Energy Use =	((1,500,000	) / (	85%	)) x (	-	)) /	1,000,000		**0 mmbtu**

Reset Potential =	Boiler Peak Load		Boiler Load		Boiler Peak Load		
Reset Potential =	((1,500,000	-	-	)/(	1,500,000	)) =	**100%**

Reset Temperature =	Reset Potential		Hot Water Reset		
Reset Temperature =	(0%	) x (	20.0	) =	**- Deg. F**

Energy Savings =	Boiler Load		Hours/Bin		Reset Factor		Conversion		
Energy Savings =	(-	) x (	706	) x (	0.080	) / (	1,000,000		**- mmbtu**

Calculation

Operation	OA Temp	Hours	Building Load (btu)	Boiler Load (btu)	Energy Use (mmBtu)	Reset Potential	Reset F	Energy Savings
Cooling	97.5	42	-	-	-	0%	0	0
Cooling	92.5	206	-	-	-	0%	0	0
Cooling	87.5	481	-	-	-	0%	0	0
Cooling	82.5	995	-	-	-	0%	0	0
Cooling	77.5	1401	-	-	-	0%	0	0
Cooling	72.5	1528	-	-	-	0%	0	0
Cooling	67.5	706	-	-	-	0%	0	0
Cooling	62.5	977	-	-	-	0%	0	0
Cooling	57.5	728	-	-	-	0%	0	0
Cooling	52.5	654	-	-	-	0%	0	0
Heating	47.5	445	75,000	500,000	262	95%	19	18
Heating	42.5	242	225,000	500,000	142	85%	17	10
Heating	37.5	254	375,000	500,000	149	75%	15	10
Heating	32.5	79	525,000	525,000	49	65%	13	3
Heating	27.5	9	675,000	675,000	7	55%	11	0
Heating	22.5	7	825,000	825,000	7	45%	9	0
Heating	17.5	6	975,000	975,000	7	35%	7	0
Heating			1,500,000	1,500,000	-	0%	0	0
Heating			1,500,000	1,500,000	-	0%	0	0
Heating			1,500,000	1,500,000	-	0%	0	0
Subtotal =		**8760 Hours**			**623 mmBtu**			**42**

Existing Energy Use =	Energy Use (in Mmbtu)		MMbh/Therm		
Existing Energy Use	= (623	) / (	0.10	) =	**6,231**

Proposed Energy Use =	Exist Energy (in mmBtu)		Energy Savings		MMbh/Therm		
Proposed Energy Use	= (623	-	42	) /	0.10		**5,808**

Result

EXISTING HEATING ENERGY	**6,231**	**Therm**	**$**	**8,662**
PROPOSED HEATING ENERGY	**5,808**	**Therm**	**$**	**8,073**

SAVINGS AT 100% GUARANTEE

HEATING ENERGY SAVINGS	**424**	**Therm**	**$**	**589**

6.8% of existing

SAVINGS AT 80% GUARANTEE

HEATING ENERGY SAVINGS	**339**	**Therm**	**$**	**471**

5.4% of existing

Comments

Title **Unoccupied Space Temperature Setpoint Adjustment**
Project: **Gainesville Police Department**
Site: Gainesville

Description Reset unoccupied space temperature setpoint up in summer and down in winter.

Given

Heating Energy Cost	$1.39	$/Therm (Nat'l Gas)	(From Bills)
Electric Energy Cost	$0.065	$/kWh	(From Bills)
Wall Area	20,000	square feet	(From survey)
Window Area	2,000	square feet	(From survey)
Roof Area	5,000	square feet	(From survey)
Total Envelope Area	27,000	square feet	
Building Heating Costs	$ 55,939		(From Bills)
Window U factor	0.60	Btu/(h*sqft*degf)	(From window survey)
Wall U factor	0.08	Btu/(h*sqft*degf)	(From wall survey)
Roof U factor	0.05	Btu/(h*sqft*degf)	(From roof survey)
Cooling Conversion	12	Mbh/Ton	
Heating Btu Conversion	100	Mbh/Therm	

Assumptions

Boiler Efficiency	85%		(Assumption)
Chiller Efficiency	0.53	kW/Ton	(Assumption)
Air Infiltration & Leakage	0.10	cfm/ft2	(Assumption)
Occupied Indoor Heating Temperature Setpoint	72	Degrees F	(Assumption)
Unoccupied Indoor Heating Temperature Setpoint	65	Degrees F	(Assumption)
Occupied Indoor Cooling Temperature Setpoint	74	Degrees F	(Assumption)
Unoccupied Indoor Cooling Temperature Setpoint	80	Degrees F	(Assumption)

Formula

Overall U Factor = ((Window U factor x Window Area) + (Wall U factor x Wall Area) + (Roof U factor x Roof Area))/ (Total Envelope Area)
Cooling Conduction (MBH) = Overall U Factor x Area x ((OA Temperature - Occupied Temperature)*Occupied Hours)+(OA Temperature - Unoccupied Temperature)*Unoccupied Hours))/1,000 btu/MBH
Heating Conduction (MBH) = Overall U Factor x Area x ((Occupied Temperature - OA Temperature)*Occupied Hours)+(Unoccupied Temperature - OA Temperature)*Unoccupied Hours))/1,000 btu/MBH
Cooling Infiltration (MBH) = Air Infiltration & Leakage x Area x ((OA Temperature - Occupied Temperature)*Occupied Hours)+(OA Temperature - Unoccupied Temperature)*Unoccupied Hours))/1,000 btu/MBH
Heating Infiltration (MBH) = Air Infiltration & Leakage x Area x ((Occupied Temperature - OA Temperature)*Occupied Hours)+(Unoccupied Temperature - OA Temperature)*Unoccupied Hours))/1,000 btu/MBH
Heat loss = (Heating Conduction) + (Heating Infiltration)
Heating Energy = (Heat Loss) / ((Boiler Efficiency) x (Conversion Factor))
Cooling loss = (Cooling Conduction) + (Cooling Infiltration)
Cooling Energy = (Cooling Loss) * (Chiller Efficiency) / (Conversion Factor)

Calculations

Overall U Factor=((Window U factor x Window Area) + (Wall U factor x Wall Area) + (Roof U factor x Roof Area)/ (Total Envelope Area)
Overall U Factor=((0.60 x 2000) + (0.08 x 20000) + (0.05 x 5000))/(27000) = **0.113 Btu/(h*sqft*degf)**

Total Envelope energy loss per year without temperature setback

OA Temp	Unoccupied Hours		Total Hours	Cooling Conduction (MBH)	Heating Conduction (MBH)	Cooling Infiltration (MBH)	Heating Infiltration (MBH)
87.5	8		481	19,805	0	18,935	0
82.5	60		995	25,795	0	24,662	0
77.5	399		1401	14,956	0	14,299	0
72.5	609		1528	0	0	0	0
67.5	247		706	0	9,690	0	9,264
62.5	332		977	0	28,309	0	27,065
57.5	248		728	0	32,196	0	30,781
52.5	241		654	0	38,897	0	37,188
47.5	191		445	0	33,253	0	31,792
42.5	107		242	0	21,774	0	20,817
37.5	122		254	0	26,727	0	25,553
32.5	38		79	0	9,518	0	9,099
27.5	2		9	0	1,222	0	1,168
22.5	3		7	0	1,057	0	1,010
17.5	3		6	0	997	0	954
				0	0	0	0
				0	0	0	0
				0	0	0	0
				0	0	0	0
				0	0	0	0
Subtotal =	**2610 Hours**		**8512 Hours**	**40,751 MBH**	**203,638 MBH**	**38,961 MBH**	**194,691 MBH**

Total Envelope energy loss per year with temperature setback

OA Temp	Unoccupied Hours		Total Hours	Cooling Conduction (MBH)	Heating Conduction (MBH)	Cooling Infiltration (MBH)	Heating Infiltration (MBH)
87.5	8		481	19,659	0	18,795	0
82.5	60		995	24,697	0	23,612	0
77.5	399		1401	7,654	0	7,318	0
72.5	609		1528	0	0	0	0
67.5	247		706	0	4,416	0	4,222
62.5	332		977	0	21,220	0	20,288
57.5	248		728	0	26,901	0	25,719
52.5	241		654	0	33,751	0	32,268
47.5	191		445	0	29,175	0	27,893
42.5	107		242	0	19,490	0	18,633
37.5	122		254	0	24,122	0	23,063
32.5	38		79	0	8,706	0	8,324
27.5	2		9	0	1,179	0	1,127
22.5	3		7	0	993	0	949
17.5	3		6	0	933	0	892
0	0		0	0	0	0	0
0	0		0	0	0	0	0
0	0		0	0	0	0	0
0	0		0	0	0	0	0
0	0		0	0	0	0	0
Subtotal =	**2610 Hours**		**8512 Hours**	**32,351 MBH**	**170,887 MBH**	**30,930 MBH**	**163,379 MBH**

Existing Heat loss=(Existing Heating Conduction) + (Existing Heating Infiltration)
Existing Heat loss=(203,638) + (194,691) = **398,329 MBH**
Proposed Heat loss=(Proposed Heating Conduction)+(Proposed Heating Infiltration)
Proposed Heat loss=(170,887) + (163,379) = **334,266 MBH** **16.1% Reduction**
Existing Cooling loss=(Existing Cooling Conduction)+(Existing Cooling Infiltration)
Existing Cooling loss=(40,751) + (38,961) = **79,712 MBH**
Proposed Cooling loss=(Proposed Cooling Conduction)+(Proposed Cooling Infiltration)
Proposed Cooling loss=(32,351) + (30,930) = **63,281 MBH** **20.6% Reduction**
Existing Heating Energy =(Existing Heat Loss)/((Boiler Efficiency)*(Conversion Factor) =
Existing Heating Energy =(398,329)/((85%)*(100) = **4,686 Therm**
Proposed Heating Energy =(Proposed Heat Loss)/((Boiler Efficiency)*(Conversion Factor) =
Proposed Heating Energy =(334,266)/((85%)*(100) = **3,933 Therm** **16.1% Reduction**
Existing Cooling Energy =(Existing Cooling Loss) x (Chiller Efficiency)/(Conversion Factor) =
Existing Cooling Energy =(79,712)*(0.53)/(12) = **3,521 kWh**
Proposed Cooling Energy =(Proposed Cooling Loss) x (Chiller Efficiency)/(Conversion Factor) =
Proposed Cooling Energy =(63,281)*(0.53)/(12) = **2,795 kWh** **20.6% Reduction**

Results

Annual Existing Heating	**4,686**	**Therm**	**=>**	**$ 6,514**	
Annual Existing Cooling	**3,521**	**kWh**	**=>**	**$ 229**	
TOTAL EXIST COST PER YEAR	==========>>			**$ 6,743**	
Annual Proposed Heating	**3,933**	**Therm**	**=>**	**$ 5,466**	
Annual Proposed Cooling	**2,795**	**kWh**	**=>**	**$ 182**	
TOTAL POPOSED COST PER YEAR	==========>>			**$ 5,648**	
SAVINGS AT 100% GUARANTEE					
Annual Heating Savings	**754**	**Therm**	**=>**	**$ 1,048**	**16.08% of existing**
Annual Cooling Savings	**726**	**kWh**	**=>**	**$ 47**	**20.61% of existing**
TOTAL EXIST COST SAVINGS PER YEAR	==========>>			**$ 1,095**	**16.24% Reduction**
SAVINGS AT 80% GUARANTEE					
Annual Heating Savings	**603**	**Therm**	**=>**	**$ 838**	**12.87% of existing**
Annual Cooling Savings	**581**	**kWh**	**=>**	**$ 38**	**16.49% of existing**
TOTAL EXIST COST SAVINGS PER YEAR	==========>>			**$ 876**	**12.99% Reduction**
					1.57% of bill

Comments

Title **Time of Day Equipment Scheduling (TOD)**
Project **Gainesville Police Department**
Site **Gainesville**

Description Equipment currently operates more than required based on occupancy. If the equipment operation is properly scheduled to meet occupancy need, it will greatly reduce energy costs.

Given

Electric Energy Costs	0.065	$/kWh						
Heating Energy Costs	$ 1.39	$/Therm (Nat'l Gas)						
Summer Indoor Temperature Setpoint	74	degF						
Winter Indoor Temperature Setpoint	72	degF						
Multiple System Operation	Group #1		Group #2			Group #3		
Total Fan System Load	35	HP	0	HP		0	HP	
Existing Operating Hours per Week	168	hours/week	90	hours/week		80	hours/week	
Operating Weeks per Year	52	weeks	50	weeks		50	weeks	
Cooling Season Operating Weeks	38	weeks	38	weeks		38	weeks	
Heating Season Operating Weeks	14	weeks	12	weeks		12	weeks	
Cooling Conversion	12,000	btu/Ton						
Heating Value of Fuel	100,000	btu/Therm						

Assumptions

Chiller Efficiency	0.53	kW/ton						
Heating Plant Efficiency	85%							
Summer Unoccupied Temperature	80	degF						
Winter Unoccupied Temperature	60	degF						
Multiple System Operation	Group #1		Group #2			Group #3		
Reduction in Runtime Hours	35	hours/week	0	hours/week		0	hours/week	
CFM per motor HP	1000	cfm/hp	800	cfm/hp		600	cfm/hp	
Cycling Factor for off hours runtime	10%		15%			20%		
Fan System Load Factor	70%		65%			60%		
Fan System Motor Efficiency	90%		85%			80%		

Formula

Motor Energy Use = (HorsePower x Load Factor x 0.746 x operating hours x operating weeks)
Motor Energy Savings = (HorsePower x Load Factor x 0.746 x reduced hours x operating weeks) x (1 - Cyclying Factor)
Cooling Energy Use = (Fan HorsePower x (cfm/hp) x 1.08 x (Avg Summer Unoccupied Temp. - Summer Indoor Setpoint (Td)) x Operating Hours x operating Weeks x Cooling eff.)/(btu/ton)
Cooling Energy Savings = (Fan HorsePower x (cfm/hp) x 1.08 x (Avg Summer Unoccupied Temp. - Summer Indoor Setpoint (Td)) x Reduced Hours x operating Weeks x Cooling eff.)/(btu/ton)
Existing Heating Use = ((Fan HorsePower x (cfm/hp) x 1.08 x Temperature Difference x Operating Hours x Heating Weeks)/(Btu/unit heating x Heating Eff))
Heating Energy Savings = ((Fan HorsePower x (cfm/hp) x 1.08 x Temperature Difference x Reduced Operating Hours x Heating Weeks)/(Btu/unit heating x Heating Eff)) x (1-Cyclying Factor)

Calculation

	HP	Load Factor	Conversion	Existing Hrs	Operating Weeks	CyclingFactor		
Exising Motor Use Group #1	=(35 x	70% x	0.746 x	168 x	52) =		On time	**159668 Kwh**
	=(35 x	70% x	0.746 x	0 x	52)x(	10%)=	Off time	**0 Kwh**
Exising Motor Use Group #2	=(0 x	65% x	0.746 x	90 x	50) =		On time	**0 Kwh**
	=(0 x	65% x	0.746 x	78 x	50)x(	15%)=	Off time	**0 Kwh**
Exising Motor Use Group #3	=(0 x	60% x	0.746 x	80 x	50) =		On time	**0 Kwh**
	=(0 x	60% x	0.746 x	88 x	50)x(	20%)=	Off time	**0 Kwh**
								159668 Kwh

	HP	Load Factor	Conversion	Reduced Hrs	Operating Weeks	CyclingFactor	
Motor Savings Group #1	=(35 x	70% x	0.746 x	35 x	52)x(1 -	10%)=	**29938 Kwh**
Motor Savings Group #2	=(0 x	65% x	0.746 x	0 x	50)x(1 -	15%)=	**0 Kwh**
Motor Savings Group #3	=(0 x	60% x	0.746 x	0 x	50)x(1 -	20%)=	**0 Kwh**
							29938 Kwh

	HP	CFM/HP	Conversion	Unoccupied Temperature	Occupied Temperature	Operating Hours	Cooling Weeks	Cooling Efficiency	Conversion	
Existing Cooling Use Group #1	=(35 x	1000 x	1.08 x (	80 -	74) x	168 x	38 x	0.53)/	12,000 =	**63948.528 Kwh**
Existing Cooling Use Group #2	=(0 x	800 x	1.08 x (	80 -	74) x	90 x	38 x	0.53)/	12,000 =	**0 Kwh**
Existing Cooling Use Group #3	=(0 x	600 x	1.08 x (	80 -	74) x	80 x	38 x	0.53)/	12,000 =	**0 Kwh**
										63949 Kwh

	HP	CFM/HP	Conversion	Unoccupied Temperature	Occupied Temperature	Reduced Hours	Cooling Weeks	Cooling Efficiency	Conversion	
Cooling Savings Group #1	=(35 x	1000 x	1.08 x (	80 -	74) x	35 x	38 x	0.53)/	12,000 =	**13322.61 Kwh**
Cooling Savings Group #2	=(0 x	800 x	1.08 x (	80 -	74) x	0 x	38 x	0.53)/	12,000 =	**0 Kwh**
Cooling Savings Group #3	=(0 x	600 x	1.08 x (	80 -	74) x	0 x	38 x	0.53)/	12,000 =	**0 Kwh**
										13323 Kwh

	HP	CFM/HP	Conversion	Temperature Difference	Existing Hours	Htg Wks	Conversion	Heating Efficiency	Cycling Factor	
Existing Heating Use Group #1	=(35 x	1000 x	1.08 x	12 x	168 x	14)/(	100,000 x	85%	) =	**12551 Therm**
	=(35 x	1000 x	1.08 x	12 x	0 x	14)/(	100,000 x	85%)x(	10%) =	**0 Therm**
Existing Heating Use Group #2	=(0 x	800 x	1.08 x	12 x	90 x	14)/(	100,000 x	85%	) =	**0 Therm**
	=(0 x	800 x	1.08 x	12 x	78 x	14)/(	100,000 x	85%)x(	15%) =	**0 Therm**
Existing Heating Use Group #3	=(0 x	600 x	1.08 x	12 x	80 x	14)/(	100,000 x	85%	) =	**0 Therm**
	=(0 x	600 x	1.08 x	12 x	88 x	14)/(	100,000 x	85%)x(	20%) =	**0 Therm**
										12551 Therm

	HP	CFM/HP	Conversion	Temperature Difference	Reduced Hrs	Htg Wks	Conversion	Heating Efficiency	Cycling Factor	
Heating Savings Group #1	=(35 x	1000 x	1.08 x	12 x	35 x	14)/(	100,000 x	85%)x(1 -	10%) =	**2353 Therm**
Heating Savings Group #2	=(0 x	800 x	1.08 x	12 x	0 x	14)/(	100,000 x	85%)x(1 -	15%) =	**0 Therm**
Heating Savings Group #3	=(0 x	600 x	1.08 x	12 x	0 x	14)/(	100,000 x	85%)x(1 -	20%) =	**0 Therm**
										2353 Therm

Existing Heating and Cooling Use are approximate and used for comparison purposes only. Calculation does not account for heat loss and ventilation, but only reset t emperature differences.

Existing Use

Existing Annual Motor Use=	**159668 Kwh**	**$**	**10,378**
Existing Annual Cooling Use=	**63949 Kwh**	**$**	**4,157**
Existing Annual Heating Use=	**12551 Therm**	**$**	**17,446**
Existing Annual Cost Use=		**$**	**31,981**

Result @ 100%

Annual Motor Savings=	**29938 Kwh**	**$**	**1,946**	**19%**	**of existing use**
Annual Cooling Savings=	**13323 Kwh**	**$**	**866**	**21%**	**of existing use**
Annual Heating Savings=	**2353 Therm**	**$**	**3,271**	**19%**	**of existing use**
Annual Cost Savings=		**$**	**6,083**	**19%**	**of existing use**

Result @ 80%

Annual Motor Savings=	**23950 Kwh**	**$**	**1,557**	**15%**	**of existing use**
Annual Cooling Savings=	**10658 Kwh**	**$**	**693**	**17%**	**of existing use**
Annual Heating Savings=	**1883 Therm**	**$**	**2,617**	**15%**	**of existing use**
Annual Cost Savings=		**$**	**4,866**	**15%**	**of existing use**

Comments

Title **Variable Air Volume Fan Control Conversion**
Project **Gainesville Police Departmen**
Site **Gainesville**

Description Calculate the energy savings by converting an existing fan system control (constant volume, discharge damper, etc.) to a new, more efficient system control (variable frequency drives).

Given

Electric Energy Costs	=	$ 0.0650	$/kWh
Electric Demand Charge	=	$ 6.33	$/kWd
Heating Costs	=	$ 1.39	$/Therm (Heating costs take into account plant efficiencies)
Cooling Costs	=	$ 0.065	$/kWh (Cooling costs take into account plant efficiencies)
Total Operating Hours per Year	=	8,760	hrs
Supply Fan (SF) Motor Horsepower	=	15.00	HP
Supply Fan (SF) Airflow	=	12,585	CFM
Supply Fan (SF) Motor Rated Efficienc	=	95%	
Existing Supply Fan System Control	=	Constant Volume	
Proposed Supply Fan System Control	=	VFD w/ no press reset	
Return Fan (RF) Motor Horsepower	=	-	HP
Return Fan (RF) Airflow	=	-	CFM
Return Fan (RF) Motor Rated Efficienc	=	0%	
Existing Return Fan System Control	=	Constant Volume	
Proposed Return Fan System Control	=	VFD w/ no press reset	
Clg Coil Ent. Air Design Enthalpy (h er	=	31.20	btu/lb of dry air (from Psychrometric Chart)
Clg Coil Lvg Air Design Enthalpy (h lvg	=	22.90	btu/lb of dry air (from Psychrometric Chart)
Htg Coil Design Temperature (T ent)	=	55	deg F (from Psychrometric Chart)
Htg Coil Design Temperature (T lvg)	=	95	deg F (from Psychrometric Chart)

Assumption

Demand Utilization Factor (DUF)	=	80%	(Estimate, percent of time that fan system is on during peak demand period)
Operating Months per Year	=	12	Months
Supply Fan (SF) Load Factor	=	0.70	
Return Fan (RF) Load Factor	=	0.70	
Total Hours of Cooling	=	6,384	Hrs } Numbers should not total to more than 8760 hrs
Total Hours of Heating	=	2,016	Hrs }
Total Hours of Equip. Operation	=	8,400	(Unaccounted Hours Assume Free Cooling is Being Done During That Period)
% of Tot. Hrs Clg at Full Load	=	35%	
% of Tot. Hrs Htg at Full Load	=	30%	

Operating Schedule

% of Flow	100%	90%	80%	70%	60%	50%	40%	Total	
% of Time (Existing)	100%	0%	0%	0%	0%	0%	0%	100%	OK
% of Time (Proposed)	5%	15%	35%	20%	20%	5%	0%	100%	OK

Formula

EXISTING CONDITIONS

*SF kWh Used	=	(SF HP x Load Factor x (% Airflow^Fan Exponent) x 0.746 / Motor Efficiency) x (Annual Op Hours x % of Time at % Airflow)
*SF kW Dem'd	=	(SF HP x Load Factor x (% Airflow^Fan Exponent) x 0.746 / Motor Efficiency) x (% of Time at % Airflow x DUF x Months/year)
*RF Used Consumption	=	(RF HP x Load Factor x (% Airflow^Fan Exponent) x 0.746 / Motor Efficiency) x (Annual Op Hours x % of Time at % Airflow)
*RF kW Dem'd	=	(RF HP x Load Factor x (% Airflow^Fan Exponent) x 0.746 / Motor Efficiency) x (% of Time at % Airflow x DUF x Months/year)
*Heating Req'd	=	(1.08 x [(SF CFM) x (% Airflow)] x (T lvg - T ent) x Op Hours x % of Time at % of Airflow x (Htg Hrs / Tot. Hrs per Yr) x % of Total Hrs Htg at Full Load) / 1,000,000
*Cooling Req'd	=	(4.5 x [(SF CFM) x (% Airflow)] x (h ent - h lvg) x Op Hours x % of Time at % of Airflow x (Clg Hrs / Tot. Hrs per Yr) x % of Total Hrs Clg at Full Load) / 1,000,000

PROPOSED CONDITIONS

*SF kWh Used After Conversion	=	(SF HP x Load Factor x (% Airflow^Fan Exponent) x 0.746 / Motor Efficiency) x (Annual Op Hours x % of Time at % Airflow)
*SF kW Dem'd After Conversion	=	(SF HP x Load Factor x (% Airflow^Fan Exponent) x 0.746 / Motor Efficiency) x (% of Time at % Airflow x DUF x Months/year)
*RF kWh Used After Conversion	=	(RF HP x Load Factor x (% Airflow^Fan Exponent) x 0.746 / Motor Efficiency) x (Annual Op Hours x % of Time at % Airflow)
*RF kW Dem'd After Conversion	=	(RF HP x Load Factor x (% Airflow^Fan Exponent) x 0.746 / Motor Efficiency) x (% of Time at % Airflow x DUF x Months/year)
*Htg Req'd After Converion	=	(1.08 x [(SF CFM) x (% Airflow)] x (T lvg - T ent) x Op Hours x % of Time at % of Airflow x (Htg Hrs / Tot. Hrs per Yr) x % of Total Hrs Htg at Full Load) / 1,000,000
*Clg Req'd After Conversion	=	(4.5 x [(SF CFM) x (% Airflow)] x (h ent - h lvg) x Op Hours x % of Time at % of Airflow x (Clg Hrs / Tot. Hrs per Yr) x % of Total Hrs Clg at Full Load) / 1,000,000

*NOTE: THIS CALCULATION IS DONE AT EVERY AIRFLOW

Calculation

EXISTING CONDITIONS

***SF kWh Used**

	SF HP		SF Load Factor		% Airflow		Fan Exponent		Conversion (HP to kW)		SF Efficiency		Annual Op Hrs		% of Time at % Airflow		
at 100% Airflow	= (15.00	x	0.70	x (	100%	^	1.0	) x	0.746	/	95%	) x (	8,760.00	x	100%	) =	72,229
at 40% Airflow	= (15.00	x	0.70	x (	40%	^	1.0	) x	0.746	/	95%	) x (	8,760.00	x	0%	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																72,229 kWh

***SF kW Dem'd**

	SF HP		SF Load Factor		% Airflow		Fan Exponent		Conversion (HP to kW)		SF Efficiency		% of Time at % Airflow		DUF		Months/Yr		
at 100% Airflow	= (15.00	x	0.70	x (	100%	^	1.0	) x	0.746	/	95%	)x(	100%	x	80%	x	12	) =	79.2
at 40% Airflow	= (15.00	x	0.70	x (	40%	^	1.0	) x	0.746	/	95%	)x(	0%	x	80%	x	12	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																		79.2 kW

***RF Used Consumption**

	RF HP		RF Load Factor		% Airflow		Fan Exponent		Conversion (HP to kW)		RF Efficiency		Annual Op Hrs		% of Time at % Airflow		
at 100% Airflow	= (-	x	0.70	x (	100%	^	1.0	) x	0.746	/	0%	) x (	8,760.00	x	100%	) =	-
at 40% Airflow	= (-	x	0.70	x (	40%	^	1.0	) x	0.746	/	0%	) x (	8,760.00	x	0%	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																- kWh

***RF kW Dem'd**

	RF HP		RF Load Factor		% Airflow		EXP FAN		Conversion (HP to kW)		RF Efficiency		% of Time at % Airflow		DUF		Months		
at 100% Airflow	= (-	x	0.70	x (	100%	^	1.0	) x	0.746	/	0%	)x(	100%	x	80%	x	12	) =	-
at 40% Airflow	= (-	x	0.70	x (	40%	^	1.0	) x	0.746	/	0%	)x(	0%	x	80%	x	12	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																		- kW

***Heating Req'd**

	CONST.		CFM		% Airflow		T lvg		T ent		Annual Op Hrs		% of Time at % Airflow		Htg Hrs		Tot. Hrs per yr		% of Hrs Htg @ Full Load		btu ==> mmbtu		
at 100% Airflow	= (1.08	x (	12,585	x	100%	)x(	95	-	55	) x	8,760	x	100%	x (	2,016	/	8,760	) x	30%	) /	1,000,000	) =	328.81
at 40% Airflow	= (1.08	x (	12,585	x	40%	)x(	95	-	55	) x	8,760	x	0%	x (	2,016	/	8,760	) x	30%	) /	1,000,000	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																						328.81 mmbtu

***Cooling Req'd**

	CONST.		CFM		% Airflow		h in		h out max		Annual Op Hrs		% of Time at % Airflow		Clg Hrs		Tot. Hrs per yr		% of Hrs Clg @ Full Load		btu ==> mmbtu		
at 100% Airflow	= (4.5	x (	12,585	x	100%	)x(	31.20	-	22.90	) x	8,760	x	100%	x (	6,384	/	8,760	) x	35%	) /	1,000,000	) =	1,050.28
at 40% Airflow	= (4.5	x (	12,585	x	40%	)x(	31.20	-	22.90		8,760	x	0%	x (	6,384		8,760		35%		1,000,000		-
TOTALS (Calculations hidden for print clarity)	==========>																						1,050.28 mmbtu

PROPOSED CONDITIONS

***SF kWh Used After Conversion**

	SF HP		SF Load Factor		% Airflow		EXP FAN		Conversion (HP to kW)		SF Efficiency		Annual Op Hrs		% of Time at % Airflow		
at 100% Airflow	= (15.00	x	0.70	x (	100%	^	2.7	) x	0.746	/	95%	) x (	8,760	x	5%	) =	3,611
at 40% Airflow	= (15.00	x	0.70	x (	40%	^	2.7	) x	0.746	/	95%	) x (	8,760	x	0%	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																35,310 kWh

***SF kW Dem'd After Conversion**

	SF HP		SF Load Factor		% Airflow		EXP FAN		Conversion (HP to kW)		SF Efficiency		% of Time at % Airflow		DUF		Months		
at 100% Airflow	= (15.00	x	0.70	x (	100%	^	2.7	) x	0.746	/	95%	)x(	5%	x	80%	x	12	) =	4.0
at 40% Airflow	= (15.00	x	0.70	x (	40%	^	2.7	) x	0.746	/	95%	)x(	0%	x	80%	x	12	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																		38.7 kW

***RF kWh Used After Conversion**

	RF HP		RF Load Factor		% Airflow		EXP FAN		Conversion (HP to kW)		RF Efficiency		Annual Op Hrs		% of Time at % Airflow		
at 100% Airflow	= (-	x	0.70	x (	100%	^	2.7	) x	0.746	/	0%	) x (	8,760.00	x	5%	) =	-
at 40% Airflow	= (-	x	0.70	x (	40%	^	2.7	) x	0.746	/	0%	) x (	8,760.00	x	0%	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																- kWh

***RF kW Dem'd After Conversion**

	RF HP		RF Load Factor		% Airflow		EXP FAN		Conversion (HP to kW)		RF Efficiency		% of Time at % Airflow		DUF		Months		
at 100% Airflow	= (-	x	0.70	x (	100%	^	2.7	) x	0.746	/	0%	)x(	5%	x	80%	x	12	) =	-
at 40% Airflow	= (-	x	0.70	x (	40%	^	2.7	) x	0.746	/	0%	)x(	0%	x	80%	x	12	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																		- kW

***Htg Req'd After Converion**

	CONST.		CFM		% Airflow		T lvg		T ent		Annual Op Hrs		% of Time at % Airflow		Htg Hrs		Tot. Hrs per yr		btu ==> mmbtu		
at 100% Airflow	= (1.08	x (	12,585	x	100%	)x(	95	-	55	) x	8,760	x	5%	x (	2,016	/	8,760	) x	30%	) /	1,000,000	) =	16.44
at 40% Airflow	= (1.08	x (	12,585	x	40%	)x(	95	-	55	) x	8,760	x	0%	x (	2,016	/	8,760	) x	30%	) /	1,000,000	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																						246.61 mmbtu

***Clg Req'd After Conversion**

	CONST.		CFM		% Airflow		h in		h out max		Annual Op Hrs		% of Time at % Airflow		Clg Hrs		Tot. Hrs per yr		btu ==> mmbtu		
at 100% Airflow	= (4.5	x (	12,585	x	100%	)x(	31.20	-	22.90	) x	8,760	x	5%	x (	6,384	/	8,760	) x	35%	) /	1,000,000	) =	52.51
at 40% Airflow	= (4.5	x (	12,585	x	40%	)x(	31.20	-	22.90		8,760	x	0%	x (	6,384	/	8,760	) x	35%	) /	1,000,000	) =	-
TOTALS (Calculations hidden for print clarity)	==========>																						787.71 mmbtu

Result

Annual Exist. Fan Consumption	**72,229**	**kWh**	=>	$	4,695
Annual Exist. Demand	**79.2**	**kW**	=>	$	501
Annual Exist. Heating Consumption	**3,288**	**Therms**	=>	$	4,570
Annual Exist. Cooling Consumption	**307,732**	**kWh**	=>	$	20,003
TOTAL EXIST COST PER YEAR				$	29,769

Annual Proposed Fan Consumption	**35,310**	**kWh**	=>	$	2,295
Annual Proposed Demand	**38.7**	**kW**	=>	$	245
Annual Proposed Heating Consumption	**2,466**	**Therms**	=>	$	3,428
Annual Proposed Cooling Consumption	**230,799**	**kWh**	=>	$	15,002
TOTAL NEW COST PER YEAR				$	20,970

100%	**Annual Fan Savings**	**36,919**	**kWh**	=>	$	2,400	
	Annual Demand Savings	**40**	**kW**	=>	$	256	
	Annual Heating Savings	**822**	**Therms**	=>	$	1,143	
	Annual Cooling Savings	**76,933**	**kWh**	=>	$	5,001	
	TOTAL SAVINGS PER YEAR				**$**	**8,799**	percent saved 30%

80%	**Annual Fan Savings**	**29,535**	**kWh**	=>	$	1,920	
	Annual Demand Savings	**32**	**kW**	=>	$	205	
	Annual Heating Savings	**658**	**Therms**	=>	$	914	
	Annual Cooling Savings	**61,546**	**kWh**	=>	$	4,001	
	TOTAL SAVINGS PER YEAR				**$**	**7,039**	percent saved 24%

Comments

References QuickFan 4.0. This is a simulation program offered by DOE.

SIEMENS

FIM 7– NEW COOLING TOWER WITH VFD

DETAILED DESCRIPTION

System Description

Cooling towers are used to provide cooling of the condenser water serving the chillers. They operate by distributing the condenser water to be cooled by spray nozzles, splash bars, or fill, which exposes a large water surface area to the atmospheric air. Atmospheric air is concurrently circulated through the tower via fans or natural convection. The capacity of the cooling tower to perform cooling is dependent on several factors including the flow of air over the media or fill and the wet bulb temperature of the air. Within certain parameters, the cooling capacity of the tower will increase with the amount of air flowing through it, and will also increase with the decrease in the outside air wet bulb temperature.

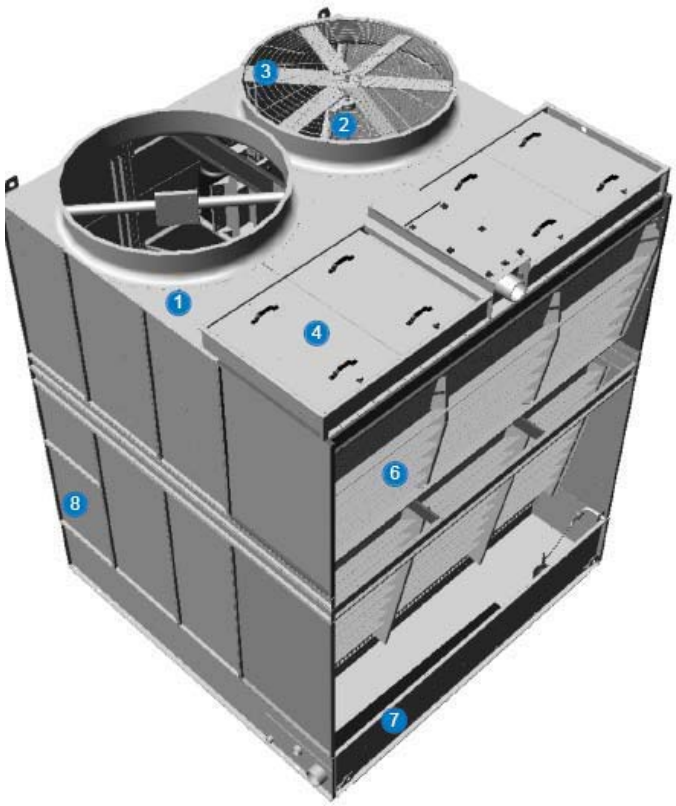
Existing Opportunities

The capacities of the existing towers are controlled by turning the fans on and off, to maintain the condenser water temperature setpoint. This is a crude method of control and tends to lead to excessive fan run time and increase wear on the fan motor.

Existing Cooling Tower

Proposed Solutions

The installation of variable frequency drives (VFDs) is recommended to control speed of the fans on the chiller cooling towers. The VFD will vary the cooling tower fan speed to maintain a constant condenser water return temperature. Energy savings will be from using less energy to operate the fan.



Typical Cooling Tower Replacement

SIEMENS proposes to install a new tower capacity control method based on the use of VFDs to control the flow of air across the tower and based on maintaining a constant condenser water return temperature. As the outside air wet bulb temperature lowers, the capacity of the tower will increase. The VFD will reduce the speed of the fan to adjust the amount of cooling performed. Savings in energy will result from the reduced amount of air moved, since the horsepower decreases with the cube of the flow.

Scope of Work	• Install two (2) new cooling towers • Install a VFD for the required pump capacities. • Install required temperature sensors and pneumatic controls. • The towers will also be isolated and be removed one at a time to keep the chilled water system operational at all times. • All work will also be performed during normal working hours. • The piping for the cooling towers will be replaced to the existing shut off valves. The existing shut off valves will be replaced with new shut off valves. • A new condenser water bypass valve will also be installed. • The tower supports (concrete) will be remaining. New steel supports will be provided to accommodate the new tower structure. • New electrical wiring and breakers will be provided from the cooling towers to the facility. • Two (2) Variable frequency drives will be installed and wired properly to the cooling tower fans. The drives will also include LAN connections in each drive and will be interfaced to the EMS system. Siemens Building Technologies, Inc. will not be responsible for the condition of the existing piping. If any further piping needs to be replaced due to lack of water treatment it will be performed outside of this contract cost.

INTEGRATION WITH EXISTING SYSTEMS AND OPERATIONS

Impact on Facility Performance, Operations and Maintenance	There is no direct impact on the facility occupants through the implementation of this measure. The VFD will, however, reduce startup wear on the motors and will achieve savings from increased efficiency. The effect this measure will have on the chillers will be to increase efficiency due to the ability to maintain more consistent condenser water temperatures. Since the facility currently uses Cooling Towers, the operation of the new towers will be similar to the operations that are currently in place.

The existing systems for water treatment to the towers will remain in place.

Special Operating Requirements

Keep Strainer Systems Clean
Strainers in the tower provide a means of keeping debris out of the condenser system water loop. Strainers in the cold water basin outlet prevent debris from reaching the pump. Some towers feature low-pressure drop pre-strainers upstream of the hot water basin to prevent clogging of distribution nozzles. Inspect and clean both strainers as necessary. Some tower designs allow external access to the strainers, which enables maintenance to take place without the need to turn off the unit.

Maintain Even Water Distribution
The water distribution system should evenly distribute water over the wet deck surface or coil section via either a gravity distribution system or a pressurized spray system, using a series of nozzles. If water distribution is found to be uneven, the nozzles need to be checked. Clean clogged nozzles in accordance with the manufacturer's recommendations.

Ensure Proper Make-up Level
Though most of the water in the system is re-circulated, some water must be added to replace what is lost by evaporation and by “bleed” (the amount of water that is discharged to prevent the accumulation of solids in the cooling water). The make-up water system provides the means to replace the water via a mechanical float ball and valve assembly or an electronic level probe assembly (with solenoid valve), which measures water depth in the cold water basin. The make-up water supply pressure should typically be between 15 psig and 50 psig to avoid problems with valves. When working with higher pressures, install a pressure reducing valve.

The operating water level of the cooling tower will vary with system thermal load (evaporation rate), the bleed rate employed, and the make-up water supply pressure. Some manufacturers offer access to the make-up assembly external to the cooling tower, which allows easy basin water depth inspection and adjustment without the need to turn off the unit. Set the tower water level in accordance with the manufacturer's recommendations to ensure no air enters the pump suction.

Adjust the Bleed Rate
To conveniently discharge water and prevent the accumulation of solids, the tower should be equipped with a bleed line (including a metering connection and globe valve) connected to a nearby drain. One way to control the required bleed is install a conductivity meter. Also, installing a separate meter to measure bleed volume, since less water is discharged to the drain than supplied to the cooling tower, can reduce water costs. Adjust the bleed rate to prevent an excessive build-up of impurities in the re-circulating water. Constant bleed and replacement with fresh water will prevent the accumulation of impurities.

Optimize the Drive Systems
The mechanical fan drive system has several components, which should be checked regularly. Before working on the mechanical system, follow proper lock-out/tag-out procedures, including locking-out all motor disconnect switches. Cooling tower fans typically use belt or gear drive systems. Both require routine maintenance to ensure reliable, trouble-free performance.

The special requirements described in this section are no different than those requirements that should currently be in place for operations of the existing towers.

EQUIPMENT INFORMATION

Manufacturer and Type

Manufacturer - We expect to install the new cooling towers from but not limited to the following manufacturers:
BAC • P.O. Box 7322. • Baltimore, MD 21227• (410) 799-6200

Manufacturer - We expect to install the VFDs from but not limited to the following manufacturers:
ABB Drives Inc., Standard Drives Division • 16250 W Glendale Dr. • New Berlin, WI 53151 • (414) 785-3200

Toshiba Adjustable Speed Drives, Toshiba Industrial Div. • 13131 W. Little York Rd. • Houston, TX 77041 • (800) 231-1412

SIEMENS

COMMISSIONING PROCEDURE

The objective of commissioning will be the process for achieving, verifying and documenting the functionality and performance of the equipment installed to meet the operational needs of the site, according to the approved design specifications, the site's functional criteria including preparation of the facilities personnel

ENVIRONMENTAL ISSUES

No environmental impacts are anticipated with the implementation of this FIM.

MEASUREMENT AND VERIFICATION

For this FIM, SIEMENS will use the Option C (whole building analysis) approach to Measurement & Verification. This method will be described in detail in a subsequent section of this Technical Audit.

TRAINING

The facility maintenance staff will be provided with, at minimum, a comprehensive, hands-on training session on the new cooling towers. The session will be provided by the manufacturer's representative and will be conducted at the facilities. Ongoing training is not required after initial training.

SIEMENS

Calculations for FIM 7: New Cooling Tower with VFD

New Cooling Tower with VFD Savings Calculations

EQUIPMENT INFORMATION

Assumptions

- The fans are assumed to be 85% loaded, yielding a demand and energy usage as shown in the above equation
- The capacity control for the existing towers is based on cycling the fans on and off.
- There is not any variable volume pumping on the condenser water.

Energy Savings Analysis
New Cooling Tower with VFD Fan versus existing Cooling Tower with one Single Speed Fan

Cooling Tower Fan Motor (Cell No.1)
Cooling Tower Cooling Load 3,450 MBTU/H

Existing Motor Single Speed	15	HP
New Motor with VFD	15	HP
Electric Unit Cost ($/kwh)	$0.0650	

OAT - DB Avg Temp F	MCWBT Temp F	Total Run hrs in Bin	Existing Condenser MBTU/H	Existing Cooling Load	Existing CT Fan kW	New CT Fan kW	Existing kWh	New kWh	Saved kWh
A Note 1	B Note 1	C	D	E	F HPx.7457	G E^3xHPx.7457 Note 2	H F x C	H G x C	H F-G
104	77	0	2,760	100%	11.2	11.2	0	0	0
99	78	21	2,478	90%	11.2	8.1	235	170	65
94	76	264	2,197	80%	11.2	5.6	2,953	1,489	1,464
89	75	596	1,915	69%	11.2	3.7	6,667	2,227	4,439
84	73	826	1,633	59%	11.2	2.3	9,239	1,915	7,324
79	71	1,290	1,352	49%	11.2	1.3	14,429	1,695	12,734
74	69	1,679	1,070	39%	11.2	0.7	18,780	1,095	17,686
69	63	1,101	789	29%	11.2	0.3	12,315	287	12,028
64	59	853	0	0%	0.0	0.0	0	0	0
59	54	673	0	0%	0.0	0.0	0	0	0
54	49	511	0	0%	0.0	0.0	0	0	0
49	44	382	0	0	0	0	0	0	0
44	40	269	0	0	0	0	0	0	0
39	35	166	0	0	0	0	0	0	0
34	30	91	0	0	0	0	0	0	0
29	26	31	0	0	0	0	0	0	0
24	20	6	0	0	0	0	0	0	0
19	16	2	0	0	0	0	0	0	0
14	10	0	0	0	0	0	0	0	0
9		0	0	0	0	0	0	0	0
		7,814					**64,619**	**8,879**	**55,740**

Monetary Annual Savings **$ 3,623**

Note:
1) Weather Data from Engineering Weather Data, Department of the Air Force, the Army and the Navy, Gainesville, FL - period of record 1973 - 1996
2) The fan demand savings are based on the fan law relationships of (Old CFM/NewCFM)^3 x Fan kW

Energy Savings Analysis
New Cooling Tower with VFD Fan versus existing Cooling Tower with one Single Speed Fan

Cooling Tower Fan Motor (Cell No.1)		Existing Motor Single Speed	15 HP
		New Motor with VFD	15 HP
Cooling Tower Cooling Load	3,450 MBTU/H	Electric Unit Cost ($/kwh)	$0.0650

OAT - DB Avg Temp F	MCWBT Temp F	Total Run hrs in Bin	Existing Condenser MBTU/H	Existing Cooling Load	Existing CT Fan kW	New CT Fan kW	Existing kWh	New kWh	Saved kWh
A Note 1	B Note 1	C	D	E	F HPx.7457	G E^3xHPx.7457 Note 2	H F x C	H G x C	H F-G
104	77	0	2,760	50%	11.2	1.4	0	0	0
99	78	21	2,478	50%	11.2	1.4	235	29	206
94	76	264	2,197	50%	11.2	1.4	2,953	369	2,584
89	75	596	1,915	50%	11.2	1.4	6,667	833	5,833
84	73	826	1,633	50%	11.2	1.4	9,239	1,155	8,084
79	71	1,290	1,352	0%	11.2	0.0	14,429	0	14,429
74	69	1,679	1,070	0%	11.2	0.0	18,780	0	18,780
69	63	1,101	789	0%	11.2	0.0	12,315	0	12,315
64	59	853	0	0%	0.0	0.0	0	0	0
59	54	673	0	0%	0.0	0.0	0	0	0
54	49	511	0	0%	0.0	0.0	0	0	0
49	44	382	0	0	0	0	0	0	0
44	40	269	0	0	0	0	0	0	0
39	35	166	0	0	0	0	0	0	0
34	30	91	0	0	0	0	0	0	0
29	26	31	0	0	0	0	0	0	0
24	20	6	0	0	0	0	0	0	0
19	16	2	0	0	0	0	0	0	0
14	10	0	0	0	0	0	0	0	0
9		0	0	0	0	0	0	0	0
		7,814					**64,619**	**2,387**	**62,232**

Monetary Annual Savings **$ 4,045**

Note:

1) Weather Data from Engineering Weather Data, Department of the Air Force, the Army and the Navy, Gainesville, FL - period of record 1973 - 1996
2) The fan demand savings are based on the fan law relationships of (Old CFM/NewCFM)^3 x Fan kW

SIEMENS

FIM 8– HIGH EFFICIENCY MOTORS

DETAILED DESCRIPTION

System Description

Energy-efficient motors, also called premium or high- efficiency motors, are 2 to 8% more efficient than standard motors. Motors qualify as "energy-efficient" if they meet or exceed the efficiency levels listed in the National Electric Manufacturers Association's (NEMA's)

Energy-efficient motors owe their higher performance to key design improvements and more accurate manufacturing tolerances. Lengthening the core and using lower-electrical-loss steel, thinner stator laminations, and more copper in the windings reduce electrical losses. Improved bearings and a smaller, more aerodynamic cooling fan further increase efficiency.

Pump and blower motors account for 80 to 90% of the energy costs in water supply, and the lifetime energy costs to run a continuous-duty motor are 10 to 20 times higher than the original motor purchase price. Thus, energy-efficient motors can play a major role in reducing facility operating costs.

Existing Opportunities

The existing chilled water pump and condenser water pump motors are all standard efficient and very old.

Typical Motor Existing on The Chilled Water Pump

Typical Existing Motor on The Condenser Water Pump

Proposed Solutions

SIEMENS proposes to install new high efficient motors on the chilled water pumps and condenser water pumps. Conserving energy by replacing motors has been possible since high efficiency models became available in the early 1990's. These new motors are able to operate under the same conditions as the original motors but perform with 10% more efficiency.

Scope of Work

SIEMENS has included the following in the proposed scope of work:

1. Materials
   - Two (2) 15 HP motors
   - Two (2) 5 HP motors

2. Labor
   a. Mechanical work
      - Remove existing motors
      - Install new motors
      - Align motors
   b. Electrical work
      - Disconnect wiring from existing motors
      - Reconnect wiring to new motors

The pumps have recently been rebuilt and will not be replaced under this contract cost. All work will be performed during normal business hours. They will be isolated so that the facility will not have any down time.

INTEGRATION WITH EXISTING SYSTEMS AND OPERATIONS

Impact on Facility Operations and Performance

Energy-efficient motors generally have longer insulation and bearing lives, lower heat output, and less vibration. In addition, these motors are often more tolerant of overload conditions and phase imbalance. This results in low failure rates, which has prompted most manufacturers to offer longer warranties for their energy-efficient lines. Hence, there is no impact on facility operations and performance.

Special Operating Requirements

There are no special operating requirements.

EQUIPMENT INFORMATION

Manufacturer and Type

Manufacturer - We expect to install high efficient motors from but not limited to the following manufacturers:

1) **GE Motors** • PO Box 2204 • Fort Wayne, IN 46801 • (800) 626-2004
2) **Emerson Elec. Co., US Elec. Motors** • 8100 W. Florissant Ave., • St. Louis, MO 63136
3) **Magnetek Motors** • 1145 Corporate Lake Drive • St. Louis, MO 63132 • (800) 672-6495
4) **Baldor Electric Co.** • PO Box 2400• Fort Smith, Arkansas 72902 • (501) 646-4711

COMMISSIONING PROCEDURE

The objective of commissioning will be the process for achieving, verifying and documenting the functionality and performance of the equipment installed to meet the operational needs of the site, according to the approved design specifications, the site's functional criteria including preparation of the facilities personnel.

ENVIRONMENTAL ISSUES

No environmental impacts are anticipated with the implementation of this FIM.

MEASUREMENT AND VERIFICATION

For this FIM, SIEMENS will use the Option C (whole building analysis) approach to Measurement & Verification. This method will be described in detail in a subsequent section of this Technical Audit.

TRAINING

An O&M manual containing the equipment catalog cuts will be provided.

SIEMENS

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Calculations for FIM 8: High Efficient Motors

High Efficient Motors Savings Calculations

CRITICAL ASSUMPTIONS

Assumptions	• The run hours are consistent, which is generally true for these applications • The motors operate at constant loads • The time periods of "peak" and "off peak" operation are consistent where applicable • The efficiency of the actual upgraded motor installed is the same as the corresponding stock motor, • The efficiency of the existing motor is the same as the original nameplate. Degradation in efficiency over time was not credited; consequently, the calculations are conservative • Ambient temperature variations that could theoretically impact efficiency are not considered • The additional energy savings that will be gained from repairing the shaft/pulley arrangement is not accounted for.

SIEMENS

PROJECT: **Gainesville Police Department**
SUBJECT: **Motor Replacement Savings Motor Analysis**

Building/Motor Location	Motor Description (HP/Encl/RPM)	Total Operating Hours/yr	Motor Load %	Upsize? Downsize? Remove?	Existing Motor HP	Proposed Motor HP	Proposed Load %	Existing Efficiency %	Premium Efficiency %	Existing Full-Load RPM	Hi Eff. Full-Load RPM
		A	B	C	D	E	F	G	H	J	K
		Note 1	*Note 2*					*Note 3*	*Note 4*	*Note 3*	*Note 4*
GPD Mechanical Room CHWP-1	15/ODP/1800	8,760	80%	Same	15.0	15.0	70%	91.0%	93.0%	1,761	1,767
GPD Mechanical Room CHWP-2	15/ODP/1800	8,760	80%	Same	15.0	15.0	70%	90.2%	93.0%	1,761	1,767
GPD Mechanical Room CWP-1	5/ODP/1800	8,760	80%	Same	5.0	5.0	70%	85.5%	89.5%	1,730	1,749
GPD Mechanical Room CWP-2	5/ODP/1800	8,760	80%	Same	5.0	5.0	70%	85.5%	89.5%	1,730	1,749

Building/Motor Location	Resheave Motor? Y or N	% Load Increase from RPM	Existing Motor kW	Existing Motor kWh	Proposed Demand kW/mo	Proposed Motor kWh	Saved Demand kW/mo	Saved Usage kWh/yr	Months of Usage	Demand Unit Cost $/kW-mo	Electric Unit Cost $/kWh	kW Savings $/yr	kWh Savings $/yr
	L	M =	N =	P =	Q =	R =	S =	T =	U	V	W		Z =
	Note 5	$(K/J)^3$-1 *Note 5*	0.746xDxB/G	NxA	0.746xExFx(1+M) / *H*	QxA	N - Q	SxA					SxUxV + TxW
GPD Mechanical Room CHWP-1	N	1.0%	9.84	86,175	8.51	74,539	1.33	11,637	12	$6.33	**$0.0650**	**$100.91**	$756
GPD Mechanical Room CHWP-2	N	1.0%	9.92	86,940	8.51	74,539	1.42	12,401	12	$6.33	**$0.0650**	**$107.53**	$806
GPD Mechanical Room CWP-1	N	3.3%	3.49	30,573	3.01	26,407	0.48	4,166	12	$6.33	**$0.0650**	**$36.12**	$271
GPD Mechanical Room CWP-2	N	3.3%	3.49	30,573	3.01	26,407	0.48	4,166	12	$6.33	**$0.0650**	**$36.12**	$271
			26.74	**234,261**	**23.05**	**201,891**	**3.70**	**32,370**					**$2,104**

Notes:

1) Operating Hours are taken from EMS controlled hours.
2) Unless measured in the field, motor load factors are estimated at 70%. Motors are typically sized for 70-80% of full load.
3) Existing efficiency based on nameplate data.
4) Premium efficiency and RPM are based on highest efficiency avaliable on the market.
5) Premium efficiency motors typically run slightly faster than standard motors. The increased speed of the motor will result in a slight increase in electrical load, based on a cube-rule law. In belt-driven systems, this increase can be eliminated through resheaving of the motor.

CASH FLOW ANALYSIS

The concept of a performance contract is that the cost of implementing the project (including financing and M&V) is covered over time through the savings generated from the project implementation. In this case, the cost of the project including all financing and M&V charges is covered through the savings within a ten (10) year period.

The cash-flow on the following page illustrates this concept. Note that while the cash flow is illustrated on the following page, it is meant to demonstrate the annual cash flows and is not an expression of guarantee. Exhibit C clearly defines what the guaranteed amounts are for this project.

Note that in any given year, the sum of the savings more than covers the cost of the project in that year. In other words, this project remains cash-flow positive in each year.

Savings from operations and maintenance cost reductions are applied through the first five (5) years. These savings represent the most informed estimate of how operations and maintenance costs will decrease as a result of the project.

For instance, since the lamps and ballasts are covered under manufacturer's warranty for the first two (2) years (lamps) and five (5) years (ballasts), there will be no expenditures from GPD required to replace expired lamps or ballasts. Currently, we estimate that GPD is spending $2,000 per year in costs of lamps and ballasts (including disposal). We have used this cost savings within the first two (2) years of the project as that is the period to which the manufacturer's warranties are in effect for both the lamps and the ballasts.

Similarly, there will be cost savings from the current amount of repairs expended on the chillers, boilers, cooling towers, and control components in the facility. An incredibly conservative estimate of the reduction of expenditures as a result of this project is $1,900 per year for the first five (5) years is applied to the cash flow. We expect this amount to be much larger than the $1,900 used in the analysis.

An escalation factor is applied to the costs we expect would be rising on an annual basis. We have applied.

Customer

Gainesville Police Dept

Year	1	2	3	4	5	6	7	8	9	10	11	12	Total
PROGRAM SAVINGS													
Energy Savings	$ 98,649	$ 99,635	$ 100,632	$ 101,638	$ 102,654	$ 103,681	$ 104,718	$ 105,765	$ 106,822	$ 107,891	$ 108,970	$ 110,059	$ 1,251,112
Operational Savings	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Construction Savings													
Annual Gross Savings	**$ 98,649**	**$ 99,635**	**$ 100,632**	**$ 101,638**	**$ 102,654**	**$ 103,681**	**$ 104,718**	**$ 105,765**	**$ 106,822**	**$ 107,891**	**$ 108,970**	**$ 110,059**	**$ 1,251,112**
Cumulative Savings	*$ 98,649*	*$ 198,284*	*$ 298,915*	*$ 400,553*	*$ 503,207*	*$ 606,888*	*$ 711,606*	*$ 817,371*	*$ 924,193*	*$ 1,032,084*	*$ 1,141,053*	*$ 1,251,112*	
O&M Savings	$ 3,900	$ 3,900	$ 1,900	$ 1,900	$ 1,900								$ 13,500
PROGRAM COSTS													
Principal & Interest	$ 91,373	$ 91,373	$ 91,373	$ 91,373	$ 91,373	$ 91,373	$ 91,373	$ 91,373	$ 91,373	$ 91,373	$ -	$ -	$ 913,731
Service TSP	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Performance Assurance	$ 11,143	$ 11,144	$ 11,144	$ 11,422	$ 11,708	$ 12,001	$ 12,301	$ 12,608	$ 12,923	$ 13,246	$ -	$ -	$ 119,640
Annual Gross Costs	**$ 102,516**	**$ 102,517**	**$ 102,517**	**$ 102,796**	**$ 103,081**	**$ 103,374**	**$ 103,674**	**$ 103,981**	**$ 104,297**	**$ 104,620**	**$ -**	**$ -**	**$ 1,033,372**
Cumulative Costs	*$ 102,516*	*$ 205,033*	*$ 307,550*	*$ 410,345*	*$ 513,427*	*$ 616,800*	*$ 720,474*	*$ 824,455*	*$ 928,752*	*$ 1,033,372*	*$ 1,033,372*	*$ 1,033,372*	
CASH FLOW													
Annual Net Cash Flow	**$ 33**	**$ 1,018**	**$ 15**	**$ 742**	**$ 1,473**	**$ 307**	**$ 1,044**	**$ 1,783**	**$ 2,526**	**$ 3,271**	**$ 108,970**	**$ 110,059**	**$ 231,241**
Cumulative Net Cash Flow	*$ 33*	*$ 1,051*	*$ 1,065*	*$ 1,808*	*$ 3,281*	*$ 3,588*	*$ 4,632*	*$ 6,415*	*$ 8,941*	*$ 12,212*	*$ 121,182*	*$ 231,241*	*$ 231,241*

Financial Summary

Program Cost	$737,040	
Rebates		
Down Payment		
Amount Financed	$737,040	
Annual Program Savings	$98,649	
Simple Payback	7.47	**Years**
Annual Interest Rate	4.37%	
Desired Finance Period	10	**Years**
Actual Finance Period		**Years**
Payments per Year	4	
Total Interest Payments	$176,691	
Energy Escalation	1.0%	
Operational Escalation		
Service Escalation	2.5%	

☐ **Include Construction Interest in Cashflow**

☐ **Also include Escrow Interest Earned**

SIEMENS

MEASUREMENT AND VERIFICATION

The preparation of an M&V plan is central to proper savings determination and the basis for verification. Advance planning ensures that all data needed for proper savings determination will be available after implementation of the energy savings program.

Data from the base year and details of the FIMs may be lost over time. Therefore it is important to properly record them for future reference, should conditions change or FIMS fail. Documentation should be prepared in a fashion that is easily assessed by verifiers and other persons not involved in its development, since several years may pass before these data are needed.

The components of the M&V plan are discussed in Exhibit C of this Agreement. The specific guarantees are also expressed there.

This Exhibit is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT:		**SIEMENS:**	
Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

Article 1: Scope

Interlocal Cooperation. The CLIENT hereby consents to the use of this Agreement by other local governments in the state of Florida, including school districts, public colleges, counties and municipalities, under the authority of the Florida Interlocal Cooperation Act of 1969 (the "Act"). The CLIENT further consents to the use of the selection process utilized by the CLIENT under the Statue, in accordance with the Act.

This Exhibit is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT:		**SIEMENS:**	
Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

SIEMENS FINANCIAL SERVICES, INC.

February 6, 2006

Siemens Financial Services, Inc. ("SFS") is pleased to provide this lease proposal for the Gainesville Police Department, Gainesville, Florida (the "Lessee") for your review and consideration. Upon your customer's approval, this proposal shall constitute Lessee's application to SFS. This proposal is subject to, among other things, Lessee being qualified to issue tax exempt obligations under the Internal Revenue Code, as well as certain additional conditions set forth hereinafter.

Lessor:	SFS, its affiliates, assigns or nominees
Lessee:	Gainesville Police Department, Gainesville, Florida
Equipment Description:	**PC Energy Project**
Total Equipment Cost:	It is anticipated that the Total Equipment Cost will not exceed $950,000.
Reimbursement:	If Lessee intends to be reimbursed for any advances it has made against the Total Equipment Cost, Lessee must provide Lessor with proof of payment acceptable to Lessor, and such reimbursement must be in accordance with all laws and regulations, including without limitation Treasury Regulation Section 1.150.2.
Escrow Fund:	Lessor is proposing to deposit the principal sum into an Escrow Fund on behalf of the Lessee to be used to acquire the Equipment. Lessee shall be responsible for paying all fees and expenses associated with the Escrow Fund.
Vendor/Supplier:	Siemens Building Technologies, Inc.
Equipment Location:	To be provided in PC contract
Lease Commencement Date:	As to each item of Equipment and Installation Services, the date specified in the applicable Lease as the Lease Commencement Date.
Maximum Lease Term:	One Hundred Forty-Four (144) months following a 4 month construction period. The Maximum Lease Term for each item of Equipment will commence on and as of the Lease Commencement Date.

Interest Rate:	Lessee will be required to make One Hundred Forty-Four (144) equal and consecutive monthly Lease Payments, each in advance, and each in the amount of $8,500.17 assuming a financed amount of $942,136.00 and a 4 month escrow period. The interest rate is locked at 4.372% through February 28, 2006. If the financing transaction commences after February 28, 2006 the rate will be adjusted according to the methodology in the paragraph below.
***Adjustments to* Lease Payments:**	The Lease Payments specified above are based upon a Reference Rate of 4.71%, as reported in *The Wall Street Journal* on February 6 2006. The Reference Rate is defined to be the yield to maturity of the U.S. Treasury Note having a 9% coupon and maturing in November, 2018, such Note having a remaining life closest to the Maximum Lease Term and in the case of multiple notes, the one trading closest to par. The interest rate that will actually be used in establishing the Lease Payments will be increased or decreased by one (1) basis point for each one (1) basis point increase or decrease in the Reference Rate as published in *The Wall Street Journal* two business days prior to the Lease Commencement Date, provided that the increase in the Reference Rate is at least ten (10) basis points.
Prepayment:	No prepayment will be allowed during the first year of the Lease. Thereafter, the purchase option price will be at 102% of the unpaid principal. Prepayment will only be allowed on a payment due date.
Type of Lease	This will be a net lease transaction, whereby all fees and costs for documentation, insurance, maintenance, filing, registration, searches and taxes relating to the purchase, lease, ownership, possession and use of the Equipment and to the transaction, including without limitation, issuance costs and all items of a similar nature, will be for Lessee's account.
Tax Treatment:	The interest portion of the Lease Payments must be excludable from the gross income of the Lessor for federal income tax purposes.
Non-Appropriation:	The Lease is subject to termination by the Lessee in the event funds for payment of the Lease are not appropriated for a given fiscal year.

Insurance:	Lessee must provide evidence of physical damage and liability insurance in an amount and from an insurance carrier satisfactory to Lessor. Lessor must be listed on the policies as loss payee and additional insured, as applicable, and a certificate of insurance is to be provided to the Lessor.
Construction Period:	Construction period is expected to begin March 1, 2006 completing June, 2006. First Lease payment is assumed to be due and payable July 1, 2006.
Deinstallation Costs:	In the event Lessee returns the Equipment as permitted in or required by the Lease, Lessee shall be responsible for all return costs, including deinstallation, packing and shipping costs.
Title:	Title to the Equipment shall remain vested in Lessor subject to Lessee's rights under the lease. Upon the exercise of the purchase option by lessee or continuation of the Lease through the Maximum Lease Term and payment of all Lease Payments and other amounts payable under the Lease through the end of the Maximum Lease Term, title to the Equipment shall immediately and without further action by Lessor vest in Lessee AS IS, WHERE IS, without warranty, express or implied, free and clear of any claim by or through Lessor, except those (if any) Lessee is obligated to discharge.
Grant of Security Interest:	Lessor shall be granted a first priority security interest in the Equipment, together with all accessions, attachments, replacements, substitutions, modifications and additions thereto, then existing or thereafter acquired, and all proceeds thereof (including insurance proceeds).
Legal Opinion:	An opinion of Lessee's legal counsel, reasonably acceptable to Lessor, as to, among other things, the legality, enforceability, authority, title and execution of the Lease will be required.

Documentation: All documentation will be provided by Lessor and must be satisfactory to all parties concerned.

[The following standard documentation, among others, will be required for this transaction:

1. Lease Agreement
2. Acceptance Certificate / Escrow Agreement
3. Amortization Schedule
4. Essential Use/Source of Funds Letter
5. Validity Opinion of Counsel
6. Resolutions
7. Officer's Certificate
8. 8038-G (GC)
9. Insurance Coverage Requirements form

Lessor may, at its discretion, order UCC, judgment, tax and similar searches against Lessee. Additional documentation and/or information may be required based upon the results of those searches.

Acceptance: Lessee must acknowledge its approval of this lease proposal by signing and returning the enclosed copy of this letter to the Lessor.

The terms and conditions outlined herein are not all-inclusive and are based upon information provided to date. This proposal does not represent an offer or commitment by Lessor to enter into a lease transaction or to purchase the Equipment described in this proposal, and does not create any obligation for Lessor. A commitment to enter into the transaction described herein may only be extended by Lessor after this transaction has been approved by all appropriate credit and other authorities within Lessor and a "written commitment letter" has been issued by Lessor. Closing of this proposed transaction will be subject to, among other things, there having occurred no material adverse change in the Lessee's financial condition or business operations or in the economic and/or regulatory conditions existing prior to the closing and, subject further, to the execution by Lessee and Lessor, and delivery to Lessor, of all documents required by Lessor, all in form and substance acceptable to Lessor. This proposal may be withdrawn or modified by Lessor at anytime prior to a definitive written commitment letter to enter into a lease transaction with Lessee being issued by Lessor and accepted by Lessee. Lessor shall have the sole right to assign this proposal, any commitment letter or any lease between Lessee and Lessor. All rates stated herein are based upon current money cost, tax rates and tax law assumptions. Should any changes occur, the rates will be adjusted accordingly.

Please feel free to contact me if you have any questions, or would like to discuss this proposal in greater detail. Upon Lessor's receipt of a properly countersigned copy of this proposal letter and the information set forth on Exhibit A hereto, the Lessor shall promptly begin the approval process so that Lessor may be in a position to finalize this transaction with Lessee. Thank you for allowing us the opportunity to present this proposal.

Sincerely,

John D. Gay
Region Manager
Siemens Financial Services, Inc.

PROPOSAL ACCEPTED:

We hereby approve the leasing proposal as presented in the above letter. In reviewing this application, Lessor is hereby authorized to obtain and utilize such credit information as may be deemed necessary and desirable by Lessor for the analysis and the processing of this proposed transaction.

LESSEE: Gainesville Police Department, Gainesville, Florida

By: _____

Name: _____

Title: _____

Date: _____

This Exhibit is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT:		**SIEMENS:**	
Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

Article 1: Revisions to the Technical Audit

The following changes are made to the existing Exhibit E (Technical Audit):

Scope of Work Additions:

Variable Speed Drive Conversion: This portion of the project is to covert Air Handling Units #1, 3, and 4 from variable pitch drive to Variable frequency drive control. The scope includes the dismantling of the existing drive pitches and pulley systems and replacing them with variable frequency drives, All pullies, sheaves, bolts and angles will be replaced with new. The scope also includes the provision of (3) new energy efficient motors of 3HP, 15HP and 20HP and (3) new 20,15, and 3 HP ABB drives. All work necessary is included in this project scope. All work will be performed during normal working hours.

Lighting Revisions and additions: This project scope is to provide all new lighting fixtures (72) for the hallways at the Gainesville Police Department. This project add also includes the removal of all opaque lenses that are existing in the two by four fixtures, cleaning the transparent lenses and replacing them back in the fixtures after they have been retrofitted with new lights and ballast.

Test and Balancing: This project scope is to provide pre testing of the chiller and boiler water systems. This will include the condenser water side. These reading will be utilized after unit start up to determine final chiller, condenser water and boiler balancing. Final water, chiller and condenser water balance is included in this project scope. The project scope also includes the calibration and balancing of the (72) VAV boxes and (27) fan coil units.

Repiping of the Fan Coil Units and VAV boxes: This project scope is to remove the existing piping and insulation to the main header for the VAV box reheat coils (54) and for the Fan coil unit chilled water and hot water coils (24 each). The existing shut off valves will be reused. Where existing shut off valves are not holding Siemens Building Technologies will require a system shut down to remove and replace existing shut off valves where required. Siemens will provide new shut off valves where required. The project cost includes the provision of all new piping from the main header to the associated chilled water and hot water coils of the fan coil units. This includes all new strainers, circuit setters and new electronic control valves. Also include in the scope of work is the provision of all new piping insulation of the branch lines where they have been replaced under this proposal.

Descriptive Changes:

The following paragraph will replace in its entirety the paragraph labeled **Air Distribution** starting on Page 4 of the Technical Audit and ending on Page 5:

> **Air Distribution**
>
> There are six (6), air handling units (AHU) that serve the building. The building is constant air volume system design. Several of these AHUs (AHU 1, 3 and 4) have variable pitch drives and are constantly dumping conditioned outside air into the space.

Page Content

The following pages 108 and 109 (next pages) will replace the existing page 108 and 109 in their entirety:

CASH FLOW ANALYSIS

The concept of a performance contract is that the cost of implementing the project (including financing and M&V) is covered over time through the savings generated from the project implementation. In this case, the cost of the project including all financing and M&V charges is covered through the savings within a twelve (12) year period.

The cash-flow on the following page illustrates this concept. Note that while the cash flow is illustrated on the following page, it is meant to demonstrate the annual cash flows and is not an expression of guarantee. Exhibit C clearly defines what the guaranteed amounts are for this project.

Note that in any given year, the sum of the savings more than covers the cost of the project in that year. In other words, this project remains cash-flow positive in each year.

Savings from operations and maintenance cost reductions are applied through the twelve year term. These savings represent the most informed estimate of how operations and maintenance costs will decrease as a result of the project.

For instance, since the lamps and ballasts are covered under manufacturer's warranty for the first two (2) years (lamps) and five (5) years (ballasts), there will be no expenditures from GPD required to replace expired lamps or ballasts. Currently, we estimate that GPD is spending $2,000 per year in costs of lamps and ballasts (including disposal). We have used this cost savings within the first two (2) years of the project as that is the period to which the manufacturer's warranties are in effect for both the lamps and the ballasts.

Similarly, there will be cost savings from the current amount of repairs expended on the chillers, boilers, cooling towers, and control components in the facility. An incredibly conservative estimate of the reduction of expenditures as a result of this project is $14,000 for the first year. This amount is reduced over time to represent the estimate of how the equipment expenses will change over the term. We expect the actual operating and maintenance amount to be much larger than the amount used in the analysis.

An escalation factor is applied to the costs we expect would be rising on an annual basis.

Customer

Gainesville Police Dept

Year	1	2	3	4	5	6	7	8	9	10	11	12	Total
PROGRAM SAVINGS													
Energy Savings	$ 98,649	$ 99,635	$ 100,632	$ 101,638	$ 102,654	$ 103,681	$ 104,718	$ 105,765	$ 106,822	$ 107,891	$ 108,970	$ 110,059	$ 1,251,112
Operational Savings	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Construction Savings													
Annual Gross Savings	**$ 98,649**	**$ 99,635**	**$ 100,632**	**$ 101,638**	**$ 102,654**	**$ 103,681**	**$ 104,718**	**$ 105,765**	**$ 106,822**	**$ 107,891**	**$ 108,970**	**$ 110,059**	**$ 1,251,112**
Cumulative Savings	*$ 98,649*	*$ 198,284*	*$ 298,915*	*$ 400,553*	*$ 503,207*	*$ 606,888*	*$ 711,606*	*$ 817,371*	*$ 924,193*	*$ 1,032,084*	*$ 1,141,053*	*$ 1,251,112*	
O&M Savings	$ 14,000	$ 13,000	$ 12,000	$ 11,500	$ 11,000	$ 10,000	$ 9,000	$ 9,500	$ 8,000	$ 7,000	$ 6,000	$ 5,500	$ 116,500
PROGRAM COSTS													
Principal & Interest	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 101,306	$ 1,215,678
Service TSP	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Performance Assurance	$ 11,143	$ 11,144	$ 11,144	$ 11,422	$ 11,708	$ 12,001	$ 12,301	$ 12,608	$ 12,923	$ 13,246	$ 13,578	$ 13,917	$ 147,135
Annual Gross Costs	**$ 112,449**	**$ 112,450**	**$ 112,450**	**$ 112,729**	**$ 113,014**	**$ 113,307**	**$ 113,607**	**$ 113,915**	**$ 114,230**	**$ 114,553**	**$ 114,884**	**$ 115,224**	**$ 1,362,812**
Cumulative Costs	*$ 112,449*	*$ 224,900*	*$ 337,350*	*$ 450,079*	*$ 563,093*	*$ 676,400*	*$ 790,007*	*$ 903,922*	*$ 1,018,152*	*$ 1,132,705*	*$ 1,247,589*	*$ 1,362,812*	
CASH FLOW													
Annual Net Cash Flow	**$ 199**	**$ 185**	**$ 181**	**$ 409**	**$ 640**	**$ 374**	**$ 110**	**$ 1,350**	**$ 593**	**$ 338**	**$ 85**	**$ 336**	**$ 4,800**
Cumulative Net Cash Flow	*$ 199*	*$ 384*	*$ 566*	*$ 975*	*$ 1,614*	*$ 1,988*	*$ 2,099*	*$ 3,449*	*$ 4,041*	*$ 4,379*	*$ 4,464*	*$ 4,800*	*$ 4,800*

Financial Summary

Program Cost	$942,136	
Rebates		
Down Payment		
Amount Financed	$942,136	
Annual Program Savings	$98,649	
Simple Payback	9.55	**Years**
Annual Interest Rate	4.37%	
Desired Finance Period	12	**Years**
Actual Finance Period		**Years**
Payments per Year	4	
Total Interest Payments	$273,542	
Energy Escalation	1.0%	
Operational Escalation		
Service Escalation	2.5%	

☐ **Include Construction Interest in Cashflow**

☐ **Also include Escrow Interest Earned**

This Exhibit is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT:		**SIEMENS:**	
Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

Tab 9: Miscellaneous Additional Project Proposals

The following are miscellaneous proposals for the Gainesville Police Department project. They include the following:

Technical Support Program for the Building Automation System: The Technical Support Program for the Building Automation System is intended to keep all of the Building Automation System in prime and peak efficiency. The program has been designed to upgrade the firmware and hardware annually, back up the systems annually and also to perform all of preventative Maintenance that is required of a system of this type.

Technical Support Program for the HVAC Systems: The Technical Support Program for the HVAC Systems is designed to keep the HVAC Systems in peak operating condition. It includes the preventative maintenance (3) times per year and (1) annual service on the fan coil units, air handling units, exhaust fans, chillers, boilers and associated cooling towers and pumps.

Siemens Building Technologies
Technical Support Program Proposal

Prepared for
Gainesville Police Dept

Building Automation System
Proposal date
12/7/2005

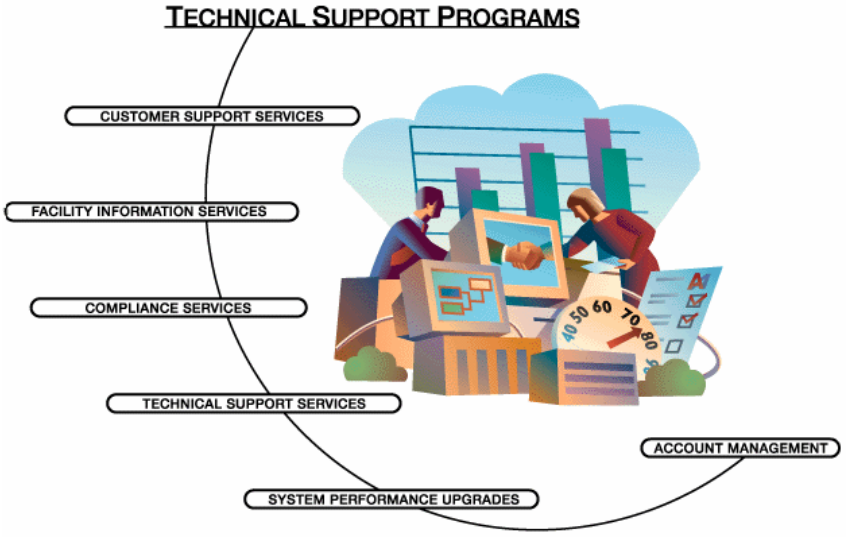


Table of Contents

Executive Summary

You have made a significant investment in a complex technical facility, which is critical to the profitability and productivity of your overall business. This proposed service solution, our Technical Support Program, will proactively serve to protect that substantial investment through a program of planned service tasks by our trained technical staff.

This Technical Support Program has been specifically developed to support your unique facility, and the services provided herein will help you in achieving the following goals:

- Maintaining the comfort & safety of the occupants of your facility
- Minimizing energy and operational costs
- Improving responsiveness and minimizing equipment downtime
- Protecting your system investment
- Improving the skills of your staff

Siemens Building Technologies is the leading single-source provider of cost-effective facility performance solutions for the comfort, life safety, security, energy efficiency and operation of some of the most technically advanced buildings in the world. Siemens is pleased to offer this proposal for Technical Support services to your facility. For more than 150 years, Siemens has built a culture of long-term commitment to customers through innovation and technology. We are confident that we have the capabilities to meet your critical facility needs today and in the future, and we look forward to the opportunity to serve you.

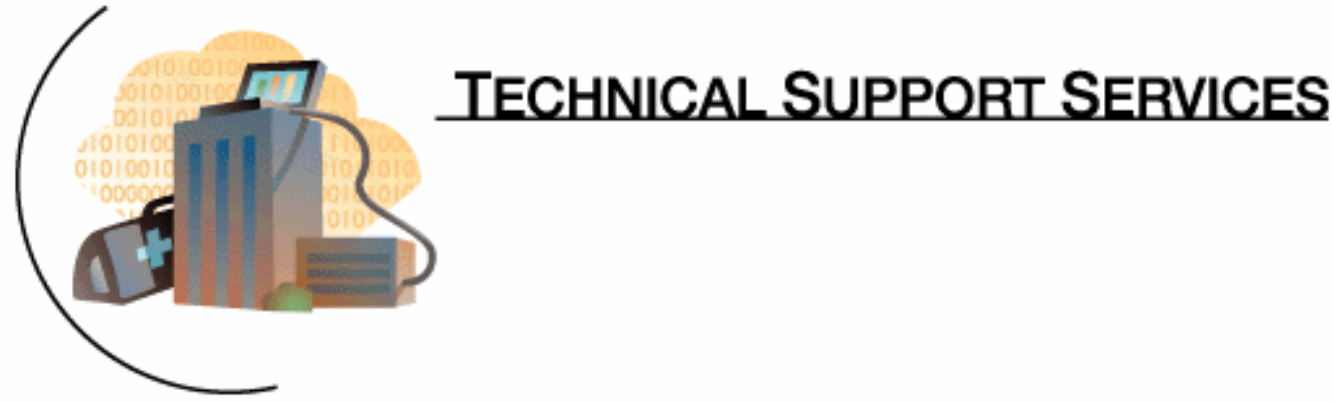
Proposed Solution

Quality Assurance

site360 Ordering. Through Siemens Building Technologies site360 Ordering portal, customers can securely access product and pricing information and place orders for non-installed parts. The Web interface provides complete ordering information, such as product detail, pricing, order status, order history (back 6 months), specification sheets, and installation instructions 24 x 7. Customers must have Internet access, their own Internet service provider, and a browser.

site360 Service. Through Siemens Building Technologies site360 Service, customers can securely access detailed information regarding their Technical Support Programs. The Web interface provides complete service information, such as service in-progress, completed service, and local field office contacts, as well as the ability to place online service requests 24x7. Customers must have Internet access, their own Internet service or provider, and browser.

HVAC CONTROL SERVICES - Automation



Automation Controls Analysis & Optimization: (4 times per year) Automation controls can drift out of calibration with changes in mechanical component performance characteristics, building use, and climatic conditions. Through this service we will extend equipment life, reduce energy consumption, and reduce the risk of costly and disruptive breakdowns. Siemens will provide preventive maintenance in accordance with a program of routines as determined by our experience, equipment application and location. The list of field panels and / or devices included under this service are identified in the List of Maintained Equipment in this proposal.

Controller Analysis & Optimization: (4 times per year) Through Controller Analysis & Optimization, we ensure reliable and optimized performance of your Terminal Equipment Controllers throughout your HVAC system. You will realize a more comfortable and productive environment and will benefit from lower energy consumption through more efficient equipment usage. Unitary and Terminal equipment can by their nature under perform due to a number of reasons; mechanical, electrical, control settings, building use and climatic conditions. Through the use of the Controller Analysis Program (CAP) and / or other tools we can pinpoint which systems have possible air flow or temperature control problems. Reports are generated on those terminal equipment controllers, which can then be investigated and resolved. The equipment to be included as part of this service is listed in the List of Maintained Equipment in this proposal.

Software Analysis & Optimization: (4 times per year) Through Software Analysis & Optimization, Siemens will help ensure that the HVAC Control System is operating properly to minimize any software problems that would negatively impact system performance. We will address any programming errors, failed points, points in alarm, unresolved points or points in operator priority, both at the front end workstation and at the field panel. This will increase system efficiency, assure compliance to specified conditions, and reduce the risk of costly and disruptive system problems. We will perform this service using onsite visits and / or remote services (if applicable).

SYSTEM PERFORMANCE UPGRADES

Firmware Updates. (1 per panel, annually) With Firmware Updates, you will benefit from new features and enhancements that will improve building operations, while extending the life of your APOGEE system investment. We will provide you with firmware and documentation updates to your existing APOGEE field panels upon development. Onsite training will familiarize you with the new features and their associated benefits. These updates deliver the benefits of Siemens Building Technologies' commitment to compatibility by design; a commitment unique in our industry. Field panels included under this service are itemized in the List of Maintained Equipment. (Upgrades to Field Panel hardware, processors, memory boards, and related hardware are excluded unless specified elsewhere.)

Software Updates. (1 per system, annually) Through this service, you will benefit from new features and enhancements that will improve building operations, take advantage of the latest version changes, while extending the life of your APOGEE investment. Siemens will provide you with software and documentation updates to your existing APOGEE software as they become available (approximately annually). Include is onsite training to familiarize you with the new features and their associated benefits. These updates deliver the benefits of Siemens Building Technologies' commitment to compatibility by design, a commitment unique in our industry. APOGEE workstations covered under this service are itemized in the List of Maintained Equipment. (Upgrades to PC's and related workstation hardware are excluded unless specified elsewhere.)

Account Management

At Siemens Building Technologies, Inc., we are dedicated to customer satisfaction. To achieve this, we have a quality assurance process, which enables you to assess the Preventative Maintenance Program designed for your facility.

Quality Assurance. (1 per year) Through implementation of our Quality Assurance Best Practices, we ensure that our delivered services are of the highest quality. We will meet with you to discuss our performance and your satisfaction with the quality of service that is being provided under your Technical Support Program. We will discuss the performance of your technical building systems, your facility and make recommendations for improvements.

When applicable, we will discuss recommendations for the service program to better meet your changing needs. We also augment this program with periodic customer satisfaction telephone surveys of your key staff members.

Training (1 day of on-site training is included)

Proposal Benefits and Financial Analysis

Proposal Benefits

The implementation of this Technical Support Program from Siemens Building Technologies will benefit your facility in the following specific ways:

- A dedicated team of service professionals will be assigned to your facility. This team provides consistent, thorough, reliable service and scheduling for support of your system.

- Customers with an active service agreement receive the priority of preferred customer response times on their calls for emergency service.

- Customers with an active service agreement receive an additional discount from our quoted rates for labor and material.

Engineering labor discount	20% from standard rate
Specialist labor discount	20% from standard rate
Mechanic labor discount	10% from standard rate
Siemens material discounts	40% less 20% from list price

- A planned program of inspections or preventive maintenance will increase system efficiency, assure compliance to specified conditions, and reduce the risk of costly and disruptive system problems.

- You will realize a more comfortable, safe, and productive environment.

Financial Analysis

The implementation of this Technical Support Program from Siemens Building Technologies will help to control the cost of operating your facility in several areas:

- You will benefit from lower energy consumption through more efficient equipment usage through our planned and proactive maintenance and calibration services.

- You will benefit from a reduction in the costs and disruptions of downtime when an unexpected problem does occur through our prompt and efficient response to emergencies.

- You will benefit by ensuring planned, budgeted and controlled operating costs through maintaining a structured contract for services.

- You will benefit from lower maintenance costs through our planned and proactive inspection, maintenance, and calibration services.

Service Team

An important benefit of our Technical Support Program derives from having Siemens Building Technologies personnel familiar with your building systems. Our implementation team provides thorough, reliable service and scheduling for the support of your system.

The following building professionals will be dedicated to your Technical Support Program:

Steven A. Moore, Sales Account Representative, manages the overall strategic service plan based upon your current and future service requirements.

Chris Casilli, Service Account Engineer, is responsible for ensuring that our contractual obligations are delivered, your expectations are being met and you are satisfied with the delivery of our services.

Miodrag Petrovic, Service Specialist, is responsible for performing the ongoing service of your automated system.

David Swinehart, is your secondary Service Specialist. Name will be familiarized with your building systems to provide in-depth backup coverage.

Don Lopez, Service Mechanic, is responsible for performing the ongoing pneumatic and mechanical service in your facility.

David Pritchett, Service Operations Manager, is responsible for managing the delivery of your entire support program and service requirements.

Customer Response Center

Jackie Creamer, Service Coordinator, is responsible for scheduling your preventive maintenance visits, and handling your emergency situations by taking the appropriate action and all service invoicing including your Technical Support Program and Time and Material projects.

Siemens Building Technologies, Inc.

Signature Page

By and Between:

Siemens Building Technologies, Inc.	Gainesville Police Dept
8940 WESTERN WAY, SUITE #1	P.O. BOX 1250
JACKSONVILLE, Florida 32256	GAINESVILLE, Florida 32602
STEVEN A. MOORE	GPD
(904)464-0808	(352)334-2400

Services shall be provided at P.O. BOX 1250, GAINESVILLE, Florida 32602.

Siemens Building Technologies, Inc. shall provide the services as outlined in the attached proposal dated 01/01/2006 and the attached terms and conditions.

Duration: This agreement shall remain in effect for an original term of 5 Years beginning 01/01/06 and from year to year thereafter.

Investments:

Year 1	01/1/2005 to 12/31/2006	$7,352 annually	paid $1,838 quarterly
Year 2	01/1/2006 to 12/31/2007	$9,716 annually	paid $ 2,429 quarterly
Year 3	01/1/2007 to 12/31/2008	$ 10,008 annually	paid $2,502 quarterly
Year 4	01/1/2008 to 12/31/2009	$ 10,308 annually	paid $2,577 quarterly
Year 5	01/1/2009 to 12/31/2010	$ 10,617 annually	paid $2,654 quarterly

Prices quoted in this proposal are firm for 30 days.

Proposal accepted by:

City of Gainesville
Gainesville Police Dept

_____
Signature Date

P.O.#_____

Proposal submitted by:

STEVEN A. MOORE
ACCOUNT EXCUTIVE
Siemens Building Technologies, Inc.

_____
Signature Date

Approved for Siemens Building Technologies, Inc. by:

DAVID PRITCHETT
SERVICE MANAGER

_____
Signature Date

SIEMENS BUILDING TECHNOLOGIES, INC.

TERMS AND CONDITIONS (W/O FLS)

The following terms and conditions are attached to and form an integral part of Siemens Building Technologies, Inc.'s (referred to herein as "SBT") Technical Support Program Proposal ("Proposal"). The portions of such Proposal relating to "Scope of Work" or any "Proposed Solution" (in either case, referred to herein as the "Proposed Solution"), together with these terms and conditions, are collectively referred to as the "TSP Agreement".

Article 1: General

1.1 a) The TSP Agreement, when accepted in writing by the Customer and approved by an authorized representative of SBT shall constitute the entire, complete and exclusive agreement between the parties relating to a technical support program ("Services") for the equipment and software identified in the List of Equipment or the Service Coverage Report attached to the TSP Agreement ("Equipment") and shall supersede and cancel all prior agreements and understandings, written or oral, relating to the subject matter of the TSP Agreement. The TSP Agreement and any rights or obligations thereunder may not be assigned by either party without the advance written consent of the other.

(b) The terms and conditions of this TSP Agreement shall not be modified or rescinded except in writing, signed by a corporate officer of SBT. SBT's performance under this TSP Agreement is expressly conditioned on Customer's assenting to all of the terms of this TSP Agreement, notwithstanding any different or additional terms contained in any writing at any time submitted or to be submitted to SBT by Customer relating to this subject matter.

c) The terms and conditions set forth herein shall supersede, govern and control any conflicting terms of the Proposed Solution or the Proposal.

1.2 This TSP Agreement shall automatically renew for successive one (1) year periods beginning on the anniversary date of the original term as set forth in the Proposal, unless stated otherwise in the TSP Agreement.

1.3 Either party may terminate or amend this TSP Agreement at the end of the initial term or at the end of a renewal term by giving the other party at least sixty (60) days prior written notice of such amendments or intent not to renew.

1.4 If, during or within 90 days after the term of this TSP Agreement, Customer engages any SBT employee who has performed work under this or any other agreement between Customer and SBT, Customer shall pay SBT an amount equal to the employee's latest annual salary.

1.5 This TSP Agreement shall be governed by and enforced in accordance with the laws of the State of Illinois. All claims or disputes arising under this TSP Agreement shall be litigated in the State or Commonwealth in which Services are being provided to Customer hereunder. The parties agree to waive their respect rights to trial by jury for matters arising out of this Agreement.

1.6 The Services are outlined in the attached Proposal's Proposed Solution provisions, incorporated by reference herein, and shall be performed on the Equipment during SBT's normal working hours, Monday through Friday inclusive, excluding holidays, unless otherwise set forth herein.

1.7 Customer will at all times designate a contact person with authority to make decisions for Customer regarding the Services. Customer will provide SBT with information sufficient to contact such person in an emergency. If such representative cannot be reached, any request for Service received from a person located at Customer's premises will be deemed authorized by Customer, and SBT will, in its discretion, act accordingly.

1.8 SBT will be permitted to control and/or operate all Equipment necessary to perform the Services.

1.9 SBT will not be required to conduct safety or other tests, install new devices or equipment or make modifications to any Equipment beyond the Proposed Solution set forth in this TSP Agreement. Any Customer request to change the Proposed Solution or the nature of the Services must be in the form of a mutually agreed change order, effective only when executed by all parties hereto.

1.10 If the Equipment is altered or moved by any person, including Customer, other than SBT or a person authorized by it, Customer shall immediately notify SBT in writing, and SBT reserves the right to perform a reacceptance test on, or if necessary a recommissioning of, the system at Customer's expense.

1.11 After any of the following events, SBT will have no liability or obligation under this TSP Agreement, whether relating to the testing, inspection, maintenance or operation of any Equipment, and may terminate or suspend services under this TSP Agreement immediately upon giving notice to Customer: Customer fails to (a) authorize a reacceptance test or recommissioning that SBT deems necessary; (b) notify SBT of any modifications or changes to the Equipment per Section 1.10; (c) notify SBT of any conditions, malfunctions or changes per Section 6.2; or (d) provide the access required by Section 6.3.

Article 2: Equipment Testing, Inspection and Maintenance

2.1 The Customer represents that all Equipment is in satisfactory working condition. Except as set forth below, by the later of the first forty-five (45) days of this TSP Agreement, the first scheduled operational inspection, or the first seasonal start-up, SBT will have inspected all the Equipment.

2.2 If SBT determines as a result of such inspection that any Equipment is in need of repair or replacement, the Customer will be so notified and shall take corrective action within thirty (30) days, or such Equipment shall be automatically removed from coverage hereunder. SBT will not be liable or responsible for the continued testing, maintenance, repair, replacement or operating capabilities of any portion of the Equipment until it has been restored to an acceptable initial condition at Customer's sole expense. Any services provided by SBT in the course of such restoration will be separately charged, on a time and materials basis, and not included in fees paid hereunder. If individual items of Equipment cannot, in SBT's sole determination, be properly repaired or replaced due to age, obsolescence, lack of availability of refrigerant gas, halon gas, necessary parts, materials, compatibility or otherwise, or as a result of excessive wear or deterioration, SBT may, within ten (10) days of such inspection, give written notice that it is withdrawing such items from coverage under this TSP Agreement and adjust the amounts to be paid hereunder accordingly.

2.3 If the Proposed Solution provides for maintenance, any repairs and replacements of Equipment are limited to restoring the proper working condition of such Equipment. SBT will not be obligated to provide replacement Equipment that represents significant capital improvement compared to the original. Exchanged components become the property of SBT, except Hazardous Materials, which will under all circumstances remain the property and responsibility of Customer.

Article 3: Charges, Fees and Invoices

3.1 Payments to be made under this TSP Agreement will provide for, and be in consideration of, only Services specifically included under the Proposed Solution. All other Services, including but not limited to the following, shall be separately billed or surcharged on a time and materials basis: (a) emergency Services performed at Customer's request, if inspection does not reveal any deficiency covered by this TSP Agreement; (b) Services performed other than during SBT's normal working hours; and (c) Service performed on equipment not covered by this TSP Agreement.

3.2 Invoices are due upon receipt or otherwise as may be set forth therein. If any payment is not received when due, SBT may deem Customer to be in breach hereof and may enforce any remedies available to it hereunder or at law, including without limitation suspension or termination of Services and acceleration of payments. Any amount not paid within sixty (60) days of the date due shall accrue interest from the date due, until paid, at the rate of ten percent (10%) per annum. In the event of a dispute by Customer regarding any portion or all of an invoiced amount, the undisputed portion shall be paid when due, and interest on the disputed, unpaid portion shall accrue as aforesaid, from the date due until the date of payment, to the extent that such amounts are finally determined to be payable to SBT.

3.3 Customer is responsible for paying any present or future sales, use, occupancy, excise or other federal, provincial, or local tax due or owing as a result of this TSP Agreement.

Article 4: Allocation of Risk

4.1(a) Until one year from either the date hereof or the date the Equipment is installed, whichever first occurs, all equipment manufactured by SBT or bearing its nameplate will be free from defects in material and workmanship arising from normal use and service.

Labor for all Services under this TSP Agreement is warranted for 90 days after the work is performed.

4.2(a) The limited warranties set forth in Section 4.1 will be void as to, and shall not apply to, any Equipment (i) repaired, altered or improperly installed by any person other than SBT or its authorized representative; (ii) subjected to unreasonable or improper use or storage, used beyond rated conditions, operated other than per SBT's or the manufacturer's instructions, or otherwise subjected to improper maintenance, negligence or accident; (iii) damaged because of any use of the Equipment after Customer has, or should have, knowledge of any defect in the Equipment; or (iv) not manufactured, fabricated and assembled by SBT or not bearing SBT's nameplate. However, SBT

assigns to Customer, without recourse, any and all assignable warranties available from any manufacturer, supplier, or subcontractor of such Equipment.

(b) Any claim under the limited warranty granted above must be made in writing to SBT within thirty (30) days after discovery of the claimed defect unless discovered directly by SBT. Such limited warranty only extends to Customer and not to any subsequent owner of the Equipment. Customer's sole and exclusive remedy for any Equipment or Services not conforming with this limited warranty is limited to, at SBT's option, (i) repair or replacement of defective components of covered Equipment, or (ii) reperformance of the defective portion of the Services, or (ii) to the extent previously paid, the issuance of a credit or refund for the original purchase price of such defective component or potion of the Equipment or Services.

(c) SBT shall not be required to repair or replace more than the component(s) of the Equipment actually found to be defective. SBT's warranty liability shall not exceed the purchase price of such item. Repaired or replaced Equipment will be warranted hereunder only for the remaining portion of the original warranty period.

4.3 THE EXPRESS LIMITED WARRANTIES PROVIDED ABOVE ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, STATUTORY, EXPRESS, OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED. SBT MAKES NO WARRANTY, EXPRESS OR IMPLIED, THAT ANY EQUIPMENT PROVIDED HEREUNDER WILL PREVENT ANY LOSS, OR WILL IN ALL CASES PROVIDE THE PROTECTION FOR WHICH IT IS INSTALLED OR INTENDED. THE LIMITED EXPRESS WARRANTIES AND REPRESENTATIONS SET FORTH IN THIS TSP AGREEMENT MAY ONLY BE MODIFIED OR SUPPLEMENTED IN A WRITING SIGNED BY A DULY AUTHORIZED CORPORATE OFFICER OF SBT.

4.4 SBT will indemnify Customer from and against losses, claims, expenses and damages (including reasonable attorney's fees) for personal injury or physical damage to property, but not loss of use of the property resulting from such damage or from damage to any work performed hereunder. Such indemnification shall be solely to the extent caused by or arising directly from SBT's or its employees', consultants' or agents' negligent acts or omissions or willful misconduct in connection with its performance of Services hereunder. SBT's obligations under this indemnity provision shall not extend to claims, losses, expenses and damages arising out of or in any way attributable to the negligence of Customer or its agents, consultants or employees other than SBT. SBT's liability to Customer or any third party under this Section or otherwise under the TSP Agreement is expressly limited to, and SBT shall not be liable other than for the direct losses, claims, expenses and damages arising as aforesaid. SBT shall in no event be responsible under this TSP Agreement for incidental, consequential, punitive, exemplary or special damages, including without limitation lost profits and/or lost business opportunities, whether arising in warranty, late or non-delivery of any Equipment or Services, tort, contract or strict liability, and regardless of whether SBT has been advised of the possibility of such damages. SBT reserves the right to control the defense and settlement of any claim for which SBT has an obligation to indemnify hereunder. The parties acknowledge that the price for which SBT has agreed to perform its Services and obligations under this TSP Agreement has been calculated based upon the foregoing limitations of liability, and that SBT has expressly relied on, and would not have entered into this TSP Agreement but for, such limitations of liability.

Article 5: Environmental

5.1 Except as disclosed pursuant to Section 5.3, Customer represents that there is no asbestos or any other hazardous or toxic materials, as defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, the regulations promulgated thereunder, and other applicable federal, state or local law ("Hazardous Materials"), present at Customer's locations where Services are performed. SBT will notify Customer immediately if it discovers or suspects the presence of any Hazardous Material. All Services have been priced and agreed to by SBT in reliance on Customer's representations as set forth in this Section 5.1 The presence of Hazardous Materials constitutes a change in the Proposed Solution equivalent to a change order whose terms must be agreed to by SBT before its obligations hereunder will continue.

5.2 Customer shall be solely responsible for testing, abating, encapsulating, removing, remedying or neutralizing such Hazardous Materials, and for the costs thereof. Even if an appropriate change order has been entered into pursuant to Section 5.1 above, SBT will continue to have the right to stop providing Services until the job site is free from Hazardous Materials. In such event, SBT will receive an equitable extension of time to complete its Services, and compensation for delays caused by Hazardous Materials remediation.

5.3 Customer warrants that, prior to the execution of the TSP Agreement, it has notified SBT in writing of any and all Hazardous Materials present, potentially present or likely to become present at Customer's locations and has provided a copy of any jobsite safety policies, including but not limited to lock-out and tag procedures, laboratory procedures, chemical hygiene plan, material safety data sheets, and other items covered or required to be disclosed or maintained by federal, state, or local laws, regulations or ordinances.

5.4 Customer hereby indemnifies and holds harmless SBT from and against any damages, losses, costs, liabilities or expenses arising from Customer's breach of, or failure to perform its obligations under, Sections 5.1, 5.2 or 5.3 above.

Article 6: Customer Responsibilities

6.1 Customer will operate and maintain all Equipment in accordance with applicable manufacturer's specifications, including those set forth in the manufacturer's operating manuals or instructions, as well as all requirements of applicable law or of authorities having jurisdiction. Such Equipment shall be operated only in the specified operating environment, which shall be supplied by Customer, including without limitation: (a) suitable electrical service, including clean, stable, properly conditioned power, to all Equipment; (b) telephone lines, capacity and connectivity as required by such Equipment; and (c) heat, light, air conditioning or other environmental controls, and other utilities in accordance with the specifications for the Equipment. Failure to so operate the Equipment will terminate immediately any maintenance obligations SBT may have hereunder.

6.2 Customer will promptly notify SBT of any unusual operating conditions, system malfunctions or building changes that may affect the Equipment or any Services.

6.3 Customer will provide SBT with reasonable means of access to the Equipment and shall make any necessary provisions to reach the Equipment and peripheral devices. Customer will be solely responsible for any removal, replacement or refinishing of the building structure or finishes that may be required to gain access to such Equipment.

6.4 Customer shall properly dispose of all ballasts, mercury bulb thermostats, used oil, contaminated filters, contaminated absorbents, refrigerant and any other Hazardous Materials that at any time are present at Customer's premises, in accordance with all applicable federal, state, and local laws, regulations, and ordinances. At no time and under no circumstances will SBT be responsible for any such removal or disposal and Customer hereby indemnifies and holds SBT harmless from and against any liability or claim arising therefrom.

6.5 Customer will, if applicable, provide and pay for a dedicated voice grade dial-up phone line and install a terminal block in a mutually agreed upon location. All on-line service Equipment (not including the phone line) will remain the property of SBT unless otherwise stated herein.

Article 7: Limitations of Maintenance or Service Obligations

7.1 SBT will not be responsible for the maintenance, repair or replacement of, or Services necessitated by reason of: (a) non-maintainable, non-replaceable, or obsolete parts of the Equipment, including but not limited to ductwork, shell and tubes, heat exchangers, coils, unit cabinets, casings, refractory material, electrical wiring, water and pneumatic piping, structural supports, cooling tower fill, slats and basins, etc. unless otherwise specifically stated herein; or (b) negligence, abuse, misuse, improper or inadequate repairs or modifications, improper operation, lack of operator maintenance or skill, failure to comply with manufacturer's operating and environmental requirements, Acts of God, or other reasons beyond its control. SBT assumes no responsibility for any service performed on any Equipment other than by SBT or its agents.

7.2 SBT shall not be responsible for loss, delay, injury or damage that may be caused by circumstances beyond its control, including but not restricted to acts or omissions by Customer or its employees or agents, Acts of God, war, civil commotion, acts of government, fire, theft, corrosion, flood, water damage, lightning, freeze-ups, computer viruses, program or system hackers, strikes, lockouts, differences with workmen, riots, explosions, quarantine restrictions, delays in transportation, or shortage of vehicles, fuel, labor or materials.

7.3 SBT is not responsible for repairs, replacements or services to Equipment due to corrosion, erosion, improper or inadequate water treatment by others, electrolytic action, chemical action or other reasons beyond its reasonable control.

7.4 SBT shall not be responsible for the removal or reinstallation of replacement valves, dampers, waterflow and tamper switches, airflow stations, and any other permanently mounted integral pipe or air duct component. Additionally, SBT shall not be responsible for any venting or draining of systems.

SIEMENS

Siemens Building Technologies
Technical Support Program

List of Maintained Equipment

Equipment Category	Equipment SubCategory	Equipment	Qty	Serial Number	Location	Mfg/Model
Field Hardware	Field Hardware	CO2 Sensor	4			
Services (Times per year): Automation A & O (PM) (1.0)						
Field Hardware	Field Hardware	Temp, Duct RTD, Averaging, Plantinum	12			
Services (Times per year): Automation A & O (PM) (1.0)						
Field Hardware	Field Hardware	Temp, Immersed RTD, Platinum	8			
Services (Times per year): Automation A & O (PM) (1.0)						
Insight Workstation Components	Insight Workstation Components	PC Hardware	1			
Services (Times per year): Automation A & O (PM) (1.0)						
Insight Workstation Components	Insight Workstation Components	Trunk Interface/IPMDA	1			
Services (Times per year): Automation A & O (PM) (1.0)						
System 600 BLN	System 600 BLN	AEM	3			
Services (Times per year): Automation A & O (PM) (1.0)						
System 600 BLN	System 600 BLN	FLN Controller	1			
Services (Times per year): Automation A & O (PM) (1.0)						
System 600 BLN	System 600 BLN	MEC With FLN	3			
Services (Times per year): Automation A & O (PM) (1.0), Software A & O (1.0)						
System 600 FLN	System 600 FLN	MEC Point Block/Expansion Mod.	23			
Services (Times per year): Automation A & O (PM) (1.0)						
System 600 MLN	System 600 MLN	Apg Svr-Crp Netwk, MLN, NT/DB	1			
Services (Times per year): Software A & O (1.0)						
System 600 MLN	System 600 MLN	Insight PC - 2.X, Corp Network	1			

Equipment Category	Equipment SubCategory	Equipment	Qty	Serial Number	Location	Mfg/Model
Services (Times per year): Software A & O (1.0)						
System 600 MLN	System 600 MLN	RENO - Data Verification	1			
Services (Times per year): Software A & O (1.0)						
System Level	System Level	Chiller Control Check	1			
Services (Times per year): Automation A & O (PM) (1.0)						
System Level	System Level	Exhaust Fan Control Check	22			
Services (Times per year): Automation A & O (PM) (1.0)						
System Level	System Level	Heating Pump Control Check	5			
Services (Times per year): Automation A & O (PM) (1.0)						
System Level	System Level	HW Boiler Control Check	1			
Services (Times per year): Automation A & O (PM) (1.0)						
System Level	System Level	Typical AHU Control Check	6			
Services (Times per year): Automation A & O (PM) (1.0)						
System Performance Updates	Firmware Updates	Firmware Flashes	4			
Services (Times per year): Firmware Update (1.0)						
System Performance Updates	Firmware Updates	Firmware Updates	4			
Services (Times per year): Firmware Update (1.0)						
System Performance Updates	Software Updates(3.X) US ONLY	Apogee Advanced single single server	1			
Services (Times per year): Software Update (1.0)						

Discounted Labor & Material Pricing

As a Technical Support Program customer with an active agreement, you will receive the benefit of a discount from our standard labor rates and material prices. Standard rates and preferred customer rates are documented below.

Please note: Rates shown are effective for the period identified. Rates are subject to change and are adjusted annually.

Effective from	**January 1, 2006**	**through**	**December 31, 2006**

Standard Labor Rates:	**Straight Time** (M-F 8 AM to 5 PM) excl. Holidays	**Regular Overtime** (M-F 5 PM to 8 AM, & Sat)	**Sunday & Holiday**
Automation Specialist	**$120.00**	**$180.00**	**$240.00**
Engineer	**$140.00**	**$210.00**	**$280.00**
Mechanic	**$85.00**	**$127.00**	**$170.00**

Preferred Customer Labor Rates:	**Straight Time** (M-F 8 AM to 5 PM) excl. Holidays	**Regular Overtime** (M-F 5 PM to 8 AM, & Sat)	**Sunday & Holiday**
Automation Specialist	**$96 .00**	**$144.00**	**$192.00**
Engineer	**$ 112.00**	**$ 160.00**	**$224.00**
Mechanic	**$76.00**	**$ 114.00**	**$152.00**

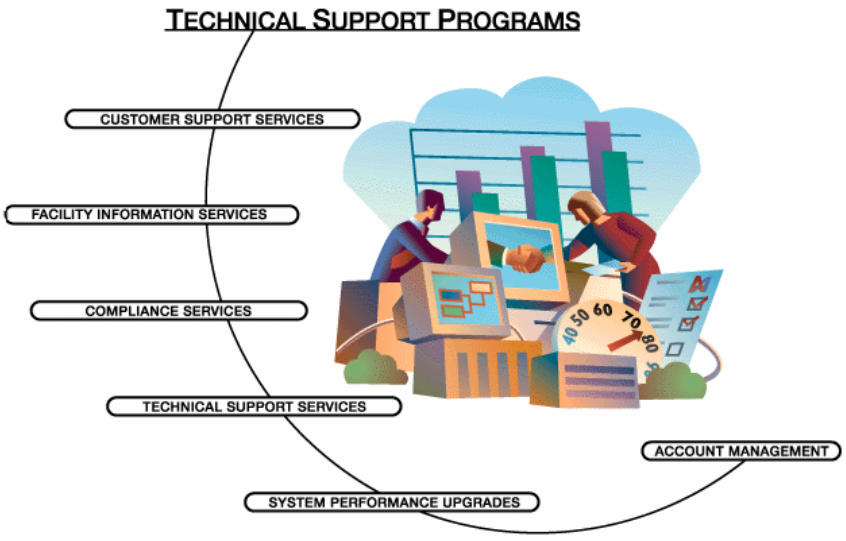
Minimum Charge: Service involving travel to the customer site will incur a two-hour minimum labor charge and $0.60 per mile one-way vehicle charge. On-line diagnostic and other remote services, as well as consulting services provided by phone, will be charged at the engineering rate with a two-hour minimum.

Material Rates: Customers with a current Technical Support Program will receive a discount of 40% less 20% off list on standard catalog pricing for Siemens Building Technologies product except products listed in the catalog with the @ sign which are limited to a 40% discount.

Siemens Building Technologies
Technical Support Program Proposal

Prepared for
Gainesville Police Dept

Mechanical Services
Proposal date
12/7/2005



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Executive Summary

You have made a significant investment in a complex technical facility, which is critical to the profitability and productivity of your overall business. This proposed service solution, our Technical Support Program, will proactively serve to protect that substantial investment through a program of planned service tasks by our trained technical staff.

This Technical Support Program has been specifically developed to support your unique facility, and the services provided herein will help you in achieving the following goals:

- Maintaining the comfort & safety of the occupants of your facility
- Minimizing energy and operational costs
- Improving responsiveness and minimizing equipment downtime
- Protecting your system investment
- Improving the skills of your staff

Siemens Building Technologies is the leading single-source provider of cost-effective facility performance solutions for the comfort, life safety, security, energy efficiency and operation of some of the most technically advanced buildings in the world. Siemens is pleased to offer this proposal for Technical Support services to your facility. For more than 150 years, Siemens has built a culture of long-term commitment to customers through innovation and technology. We are confident that we have the capabilities to meet your critical facility needs today and in the future, and we look forward to the opportunity to serve you.

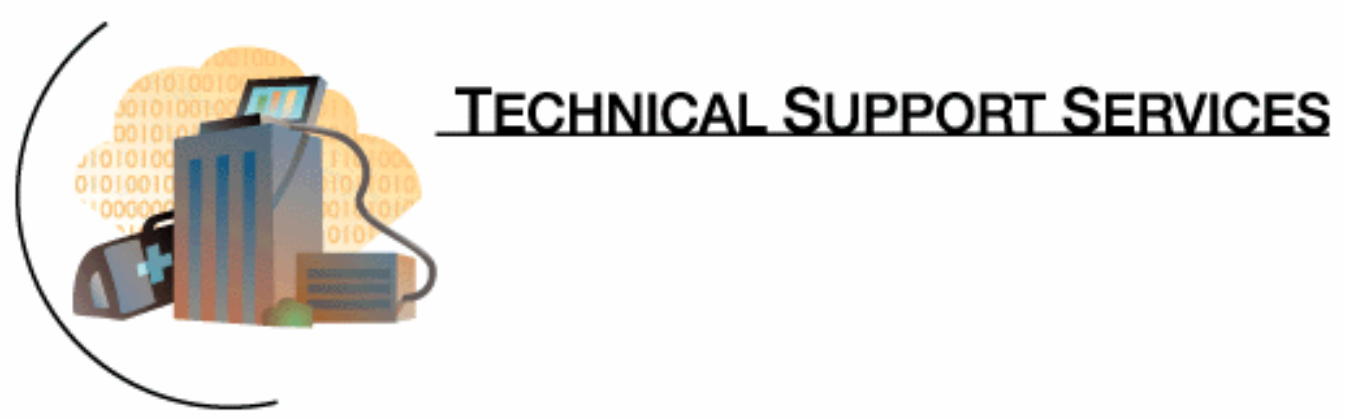
Proposed Solution

Quality Assurance

site360 Ordering. Through Siemens Building Technologies site360 Ordering portal, customers can securely access product and pricing information and place orders for non-installed parts. The Web interface provides complete ordering information, such as product detail, pricing, order status, order history (back 6 months), specification sheets, and installation instructions 24 x 7. Customers must have Internet access, their own Internet service provider, and a browser.

site360 Service. Through Siemens Building Technologies site360 Service, customers can securely access detailed information regarding their Technical Support Programs. The Web interface provides complete service information, such as service in-progress, completed service, and local field office contacts, as well as the ability to place online service requests 24x7. Customers must have Internet access, their own Internet service or provider, and browser.

MECHANICAL SERVICES



Air Cooled Condenser Coil Cleaning. Through this service we will improve airflow across condenser coils, and improve heat transfer. This service will extend the life of the compressors. Coil cleaning consists of cleaning the outside surface of the condensing unit coils to remove any airborne particles, dirt build-up by using a brush, high pressure air, chemical with low pressure wash or chemical with high pressure wash at our discretion based on

condition of outside environment and coil accessibility. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Annual Maintenance. We will perform scheduled annual preventive maintenance in accordance with a program of standard routines as determined by our experience, equipment application, and equipment operating hours that are recommended by each equipment manufacturer and location. This service is designed to optimize the reliability and efficiency of the equipment, extend the useful life of your equipment, and provide you with possible indications of excessive wear and damage to your systems before a catastrophic failure occurs during the next operating season. Depending on our findings we may also provide recommendations for additional service(s) that will better enhance equipment performance. The equipment included under this service is itemized in the List of Maintained Equipment section of this proposal.

Cooling Tower Cleaning. Once your cooling towers have been drained, we will clean and remove normal debris from the cooling tower basins and distribution pans. This provides for even water flow and no debris in the system that could block chiller condenser tubes and restrict condenser flow, thus preventing nuisance chiller trips and poor chiller energy and system efficiency. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Evaporator Coil Cleaning. We will clean your air handling unit evaporator coils to help to improve air circulation in the air distribution system, and reduce dust and dirt that is in the system. Coils will be cleaned at a time that is mutually agreeable between your staff and us. Coil cleaning consists of cleaning the surface of the evaporator coil to remove dust and dirt particles that have collected on the evaporator coil. Coils will be cleaned using a vacuum cleaner or other device that allows us to properly clean the coil. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Fireside Tube Brush Cleaning. Through this service we will clean soot ash and debris from tubes, allowing for better heat transfer and system efficiency. We will open the fire side of boiler and brush fire tubes, remove soot and debris from the fireside of the boiler, inspect tubes, burners and burner throat, fire box and door refractory, and close boiler doors with new gaskets and door seals. Upon completion of this service we will provide recommendations for corrective action(s), if uncovered. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

HVAC Air Filter Changing Service. Through this service we will maintain indoor air quality by changing filters and minimizing dust and particles from collecting on ductwork. This service also helps insure proper flow through cooling and heating coils thus preventing restrictions in airflow, leading to higher system and energy efficiency. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal. In the event the air filter material or cleaning requires different frequencies than indicated (due to experience or changes in operating conditions), recommendations will be made for your approval to adjust the frequencies and any associated price.

Oil Acid Test. We will provide an on the spot oil acid test on your reciprocating compressor to test for the presence of harmful acids in the oil and refrigeration circuit from either previous leaks or other system problems. This test provides immediate feed back on the condition of both the oil and the refrigerant in the system. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Operating Inspection - Cool. Through this service we will help to assure mechanical equipment continues to operate efficiently, safely and with little operating disruptions during the operating season. We will provide routine operating inspection(s) to check system performance in accordance with a program of standard routines as determined by our experience, the equipment manufacturer's published recommendations, equipment application, and location. You will find a detailed list of the tasks included with this service in the Equipment Tasking section of this proposal. This service will focus on equipment operation, fluid levels, operating and safety controls, and safe equipment operation. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Operating Inspection - Heat. Through this service we will help to assure mechanical equipment continues to operate efficiently, safely and with little operating disruptions during the operating season. We will provide routine

operating inspection(s) to check system performance in accordance with a program of standard routines as determined by our experience, the equipment manufacturer's published recommendations, equipment application, and location. You will find a detailed list of the tasks included with this service in the Equipment Tasking section of this proposal. This service will focus on equipment operation, fluid levels, operating and safety controls, and safe equipment operation. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Operating Inspection. Through this service we will help to assure mechanical equipment continues to operate efficiently, safely and with little operating disruptions during the operating season. We will provide routine operating inspection(s) to check system performance in accordance with a program of standard routines as determined by our experience, the equipment manufacturer's published recommendations, equipment application, and location. You will find a detailed list of the tasks included with this service in the Equipment Tasking section of this proposal. This service will focus on equipment operation, fluid levels, operating and safety controls, and safe equipment operation. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Refrigerant Oil Analysis. We will perform spectrochemical refrigerant oil analysis and trend oil condition to identify contaminants and possible system malfunctions caused by wear of moving parts, such as bearings and shafts. This predictive wear analysis provides early identification of problems prior to them becoming unplanned and costly. Based on the oil analysis results, we will recommend when oil changes are needed, and may make other recommendations regarding the operation and maintenance of your chiller plant. This service reduces the amount of waste oil generated. Oil changes are outside the scope of this service. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Seasonal Inspection - Cooling. Through this service we will help to assure optimum cooling system performance and safety, and assure the mechanical equipment is ready prior to the cooling season. We will provide seasonal inspection services in accordance with a program of standard routines as determined by our experience, the equipment manufacturer's published recommendations, equipment application, and location. This service is designed to optimize the reliability and efficiency of the equipment, and provide you with possible indications of excessive wear and damage to your systems to minimize the possibility of catastrophic failure during the next operating season. This service will focus on equipment operation, fluid levels, operating and safety controls, and safe equipment operation. A list of covered equipment and the frequency of the inspection service for cooling equipment is included in the List of Maintained Equipment section of this proposal.

Seasonal Inspection - Heating. Through this service we will help to assure optimum heating system performance and safety, and assure the mechanical equipment is ready prior to the heating season. We will provide seasonal inspection services in accordance with a program of standard routines as determined by our experience, the equipment manufacturer's published recommendations, equipment application, and location. This service is designed to optimize the reliability and efficiency of the equipment, and provide you with possible indications of excessive wear and damage to your systems to minimize the possibility of catastrophic failure during the next operating season. This service will focus on equipment operation, fluid levels, operating and safety controls, and safe equipment operation. A list of covered equipment and the frequency of the inspection service for heating equipment is included in the List of Maintained Equipment section of this proposal.

Shut Down / Annual Inspection. We will perform scheduled annual preventive maintenance in accordance with a program of standard routines as determined by our experience, equipment application, and equipment operating hours that are recommended by each equipment manufacturer and location. You will find a detailed list of the tasks included with this service in the Equipment Tasking section of this proposal. This service is designed to optimize the reliability and efficiency of the equipment, and provide you with possible indications of excessive wear and damage to your systems before a catastrophic failure occurs during the next operating season. Depending on our findings we may also provide recommendations for additional service(s) that will better enhance equipment performance. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal. In addition, for centrifugal, reciprocating and screw chillers, we will leak test all equipment containing refrigerant, report findings and provide a list of recommended repairs (if necessary). We will recover your refrigerant as appropriate to reduce emissions and cost of replacement refrigerant and keep you

informed regarding refrigerant issues and opportunities. All refrigerant containment will be performed in accordance with EPA regulations and guidelines.

Start-Up Inspection. Through this service we will help to assure optimum system performance and safety, and assure the mechanical equipment is ready for the new operating season. We will provide start-up services in accordance with a program of standard routines as determined by our experience, the equipment manufacturer's published recommendations, equipment application, and location. You will find a detailed list of the tasks included with this service in the Equipment Tasking section of this proposal. This service will focus on equipment operation, fluid levels, operating and safety controls, and safe equipment operation. The equipment included under this service is itemized in the List of Maintained Equipment in this proposal.

Equipment Tasking

The following tasks listed herein for each equipment type will be performed at the intervals planned. These tasks are designed to place the equipment into prime operating condition so that the equipment will operate effectively, reliably, and efficiently.

Chillers / Screws / Water Cooled

Annual Maintenance

- Leak check entire system
- Megger motors
- Change oil and refrigerant filters
- Clean and tighten electrical connections
- Calibrate safety and operating controls
- Inspect and service motor starters

Operating Inspection

- Log all operating conditions
- Confirm chiller operation
- Inspect overall condition
- Check refrigerant charge
- Check lube system
- Lubricate per OEM recommendations

Pumps / Pumps

Operating Inspection

- Visually inspect and evaluate operating conditions
- Check system for leaks
- Check motor amps and voltage
- Check for unusual vibration or noise
- Lubricate per OEM recommendations

Start-Up Inspection

- Check shaft alignment
- Inspect packing and seal for leakage
- Visually inspect and evaluate operating conditions

- Check motor amps and voltage
- Check for unusual vibration or noise

Heating Systems / HW - Boiler

Operating Inspection

- Log and evaluate operating conditions
- Confirm burner and fuel system operation
- Check fuel system for leaks
- Check safety and operating controls
- Check combustion air make-up system
- Check for proper venting of flue gas

Shut Down / Annual Inspection

- Perform operating inspection and shut down boiler
- Lockout and tagout power and secure fuel supply
- Service burner and fuel system as necessary
- Drain boiler as necessary
- Service water level controls and gauge glass
- Complete insurance inspection paperwork

Start-Up Inspection

- Refill boiler as necessary
- Restore power and fuel supply
- Calibrate safety and operating controls
- Lubricate per OEM recommendations
- Verify operation of all safety controls
- Start boiler and perform operating inspection

Built Up Units - AHU's / Fan System \ Centrifugal

Operating Inspection - Heating

- Confirm fan operation
- Record motor amps and voltage
- Inspect overall condition
- Check bearing temperature
- Check belt tension and condition
- Lubricate per OEM recommendations

Seasonal Inspection - Heating

- Confirm fan operation
- Record motor amps and voltage
- Inspect overall condition
- Check starter contacts and electrical connections
- Replace belts and check sheaves

- Lubricate per OEM recommendations

Built Up Units - AHU's / CW Coil

Operating Inspection - Cooling

- Check air vents and air in coil
- Inspect overall condition
- Check control valve
- Check freeze protection thermostat
- Check condensate drain pan and drain

Built Up Units - AHU's / HW Coil

Operating Inspection - Heating

- Check air vents and air in coil
- Inspect overall condition
- Check control valve
- Check freeze protection thermostat

Stand Alone / Exhaust Fans

Seasonal Inspection - Heating

- Confirm fan operation
- Record motor amps and voltage
- Inspect overall condition
- Check starter contacts and electrical connections
- Replace belts and check sheaves
- Lubricate per OEM recommendations

Stand Alone / Fan Coils

Operating Inspection - Heating

- Inspect overall condition
- Confirm heating coil or burner operation
- Lubricate per OEM recommendations

Stand Alone / Make-Up-Air-Units - A/C Only

Operating Inspection - Cooling

- Inspect overall condition
- Confirm DX system operation
- Check refrigerant charge
- Check belt tension and condition
- Lubricate per OEM recommendations

Seasonal Inspection - Cooling

- Inspect overall condition
- Service DX system as necessary
- Calibrate safety and operating controls

- Check starter contacts and electrical connections
- Replace belts and check sheaves
- Lubricate per OEM recommendations

Account Management

At Siemens Building Technologies, Inc., we are dedicated to customer satisfaction. To achieve this, we have a quality assurance process, which enables you to assess the Preventative Maintenance Program designed for your facility.

Quality Assurance. Through implementation of our Quality Assurance Best Practices, we ensure that our delivered services are of the highest quality. We will meet with you to discuss our performance and your satisfaction with the quality of service that is being provided under your Technical Support Program. We will discuss the performance of your technical building systems, your facility and make recommendations for improvements.

When applicable, we will discuss recommendations for the service program to better meet your changing needs. We also augment this program with periodic customer satisfaction telephone surveys of your key staff members.

Proposal Benefits and Financial Analysis

Proposal Benefits

The implementation of this Technical Support Program from Siemens Building Technologies will benefit your facility in the following specific ways:

- A dedicated team of service professionals will be assigned to your facility. This team provides consistent, thorough, reliable service and scheduling for support of your system.

- Customers with an active service agreement receive the priority of preferred customer response times on their calls for emergency service.

- Customers with an active service agreement receive an additional discount from our quoted rates for labor and material.

Engineering labor discount	20% from standard rate
Specialist labor discount	20% from standard rate
Mechanic labor discount	10% from standard rate
Siemens material discounts	40% less 20% from list price

- A planned program of inspections or preventive maintenance will increase system efficiency, assure compliance to specified conditions, and reduce the risk of costly and disruptive system problems.

- You will realize a more comfortable, safe, and productive environment.

Financial Analysis

The implementation of this Technical Support Program from Siemens Building Technologies will help to control the cost of operating your facility in several areas:

- You will benefit from lower energy consumption through more efficient equipment usage through our planned and proactive maintenance and calibration services.

- You will benefit from a reduction in the costs and disruptions of downtime when an unexpected problem does occur through our prompt and efficient response to emergencies.

- You will benefit by ensuring planned, budgeted and controlled operating costs through maintaining a structured contract for services.

- You will benefit from lower maintenance costs through our planned and proactive inspection, maintenance, and calibration services.

Service Team

An important benefit of our Technical Support Program derives from having Siemens Building Technologies personnel familiar with your building systems. Our implementation team provides thorough, reliable service and scheduling for the support of your system.

The following building professionals will be dedicated to your Technical Support Program:

Steven A. Moore, Sales Account Representative, manages the overall strategic service plan based upon your current and future service requirements.

Chris Casilli, Service Account Engineer, is responsible for ensuring that our contractual obligations are delivered, your expectations are being met and you are satisfied with the delivery of our services.

Miodrag Petrovic, Service Specialist, is responsible for performing the ongoing service of your automated system.

David Swinehart, is your secondary Service Specialist. Name will be familiarized with your building systems to provide in-depth backup coverage.

Don Lopez, Service Mechanic, is responsible for performing the ongoing pneumatic and mechanical service in your facility.

David Pritchett, Service Operations Manager, is responsible for managing the delivery of your entire support program and service requirements.

Customer Response Center

Jackie Creamer, Service Coordinator, is responsible for scheduling your preventive maintenance visits, and handling your emergency situations by taking the appropriate action all service invoicing including your Technical Support Program and Time and Material projects.

Siemens Building Technologies, Inc.

Signature Page

By and Between:

Siemens Building Technologies, Inc.	Gainesville Police Dept
8940 Western Way, Suite #1	P.O. Box 1250
Jacksonville, Florida 32256	Gainesville, Florida 32602
Steven A. Moore	GPD
(904)464-0808	(352)334-2400

Services shall be provided at P.O. Box 1250, Gainesville, Florida 32602.

Siemens Building Technologies, Inc. shall provide the services as outlined in the attached proposal dated 12/7/2005 and the attached terms and conditions.

Duration: This agreement shall remain in effect for an original term of 5 Years beginning 12/1/2005 and from year to year thereafter.

Investments:

Year 1	12/1/2005 to 11/30/2006	$29,856 annually	paid $29,856 annually
Year 2	12/1/2006 to 11/30/2007	$30,456 annually	paid $30,456 annually
Year 3	12/1/2007 to 11/30/2008	$31,068 annually	paid $31,068 annually
Year 4	12/1/2008 to 11/30/2009	$31,692 annually	paid $31,692 annually
Year 5	12/1/2009 to 11/30/2010	$32,328 annually	paid $32,328 annually

Prices quoted in this proposal are firm for 30 days.

Proposal accepted by:

GPD
GPD
Gainesville Police Dept

_____
Signature Date

P.O.#_____

Proposal submitted by:

Steven A. Moore
Account Executive
Siemens Building Technologies, Inc.

_____
Signature Date

Approved for Siemens Building Technologies, Inc. by:

David Pritchett
Service Manager

_____
Signature Date

Account Payment Contacts

Customer Address	**Billing Address**
Contact Name	Billing Contact Name
Customer Account Name	Billing Name
Account Address	Billing Address
City, State/Province Zip/Postal Code	City, State/Province Zip/Postal Code

Payment terms and amounts are detailed on the preceding Signature Page.

Customer

Account Payable Contact:

Account Payable Telephone Number:

Purchase Order Number: _____

Purchase Order Date: _____/_____/_____

Expiration Date of Purchase Order: _____/_____/_____

Length of Term of this Agreement: _____ years

Is same PO valid through term of agreement? **Yes** ☐ **No** ☐

Siemens

Account Receivable Contact:

Account Receivable Telephone Number:

Accounting Manager:

Accounting Manager Telephone Number:

SIEMENS BUILDING TECHNOLOGIES, INC.

TERMS AND CONDITIONS (W/O FLS)

The following terms and conditions are attached to and form an integral part of Siemens Building Technologies, Inc.'s (referred to herein as "SBT") Technical Support Program Proposal ("Proposal"). The portions of such Proposal relating to "Scope of Work" or any "Proposed Solution" (in either case, referred to herein as the "Proposed Solution"), together with these terms and conditions, are collectively referred to as the "TSP Agreement".

Article 1: General

1.1 a) The TSP Agreement, when accepted in writing by the Customer and approved by an authorized representative of SBT shall constitute the entire, complete and exclusive agreement between the parties relating to a technical support program ("Services") for the equipment and software identified in the List of Equipment or the Service Coverage Report attached to the TSP Agreement ("Equipment") and shall supersede and cancel all prior agreements and understandings, written or oral, relating to the subject matter of the TSP Agreement. The TSP Agreement and any rights or obligations thereunder may not be assigned by either party without the advance written consent of the other.

(b) The terms and conditions of this TSP Agreement shall not be modified or rescinded except in writing, signed by a corporate officer of SBT. SBT's performance under this TSP Agreement is expressly conditioned on Customer's assenting to all of the terms of this TSP Agreement, notwithstanding any different or additional terms contained in any writing at any time submitted or to be submitted to SBT by Customer relating to this subject matter.

c) The terms and conditions set forth herein shall supersede, govern and control any conflicting terms of the Proposed Solution or the Proposal.

1.2 This TSP Agreement shall automatically renew for successive one (1) year periods beginning on the anniversary date of the original term as set forth in the Proposal, unless stated otherwise in the TSP Agreement.

1.3 Either party may terminate or amend this TSP Agreement at the end of the initial term or at the end of a renewal term by giving the other party at least sixty (60) days prior written notice of such amendments or intent not to renew.

1.4 If, during or within 90 days after the term of this TSP Agreement, Customer engages any SBT employee who has performed work under this or any other agreement between Customer and SBT, Customer shall pay SBT an amount equal to the employee's latest annual salary.

1.5 This TSP Agreement shall be governed by and enforced in accordance with the laws of the State of Illinois. All claims or disputes arising under this TSP Agreement shall be litigated in the State or Commonwealth in which Services are being provided to Customer hereunder. The parties agree to waive their respect rights to trial by jury for matters arising out of this Agreement.

1.6 The Services are outlined in the attached Proposal's Proposed Solution provisions, incorporated by reference herein, and shall be performed on the Equipment during SBT's normal working hours, Monday through Friday inclusive, excluding holidays, unless otherwise set forth herein.

1.7 Customer will at all times designate a contact person with authority to make decisions for Customer regarding the Services. Customer will provide SBT with information sufficient to contact such person in an emergency. If such representative cannot be reached, any request for Service received from a person located at Customer's premises will be deemed authorized by Customer, and SBT will, in its discretion, act accordingly.

1.8 SBT will be permitted to control and/or operate all Equipment necessary to perform the Services.

1.9 SBT will not be required to conduct safety or other tests, install new devices or equipment or make modifications to any Equipment beyond the Proposed Solution set forth in this TSP Agreement. Any Customer request to change the Proposed Solution or the nature of the Services must be in the form of a mutually agreed change order, effective only when executed by all parties hereto.

1.10 If the Equipment is altered or moved by any person, including Customer, other than SBT or a person authorized by it, Customer shall immediately notify SBT in writing, and SBT reserves the right to perform a reacceptance test on, or if necessary a recommissioning of, the system at Customer's expense.

1.11 After any of the following events, SBT will have no liability or obligation under this TSP Agreement, whether relating to the testing, inspection, maintenance or operation of any Equipment, and may terminate or suspend services under this TSP Agreement immediately upon giving notice to Customer: Customer fails to (a) authorize a reacceptance test or recommissioning that SBT deems necessary; (b) notify SBT of any modifications or changes to the Equipment per Section 1.10; (c) notify SBT of any conditions, malfunctions or changes per Section 6.2; or (d) provide the access required by Section 6.3.

Article 2: Equipment Testing, Inspection and Maintenance

2.1 The Customer represents that all Equipment is in satisfactory working condition. Except as set forth below, by the later of the first forty-five (45) days of this TSP Agreement, the first scheduled operational inspection, or the first seasonal start-up, SBT will have inspected all the Equipment.

2.2 If SBT determines as a result of such inspection that any Equipment is in need of repair or replacement, the Customer will be so notified and shall take corrective action within thirty (30) days, or such Equipment shall be automatically removed from coverage hereunder. SBT will not be liable or responsible for the continued testing, maintenance, repair, replacement or operating capabilities of any portion of the Equipment until it has been restored to an acceptable initial condition at Customer's sole expense. Any services provided by SBT in the course of such restoration will be separately charged, on a time and materials basis, and not included in fees paid hereunder. If individual items of Equipment cannot, in SBT's sole determination, be properly repaired or replaced due to age, obsolescence, lack of availability of refrigerant gas, halon gas, necessary parts, materials, compatibility or otherwise, or as a result of excessive wear or deterioration, SBT may, within ten (10) days of such inspection, give written notice that it is withdrawing such items from coverage under this TSP Agreement and adjust the amounts to be paid hereunder accordingly.

2.3 If the Proposed Solution provides for maintenance, any repairs and replacements of Equipment are limited to restoring the proper working condition of such Equipment. SBT will not be obligated to provide replacement Equipment that represents significant capital improvement compared to the original. Exchanged components become the property of SBT, except Hazardous Materials, which will under all circumstances remain the property and responsibility of Customer.

Article 3: Charges, Fees and Invoices

3.1 Payments to be made under this TSP Agreement will provide for, and be in consideration of, only Services specifically included under the Proposed Solution. All other Services, including but not limited to the following, shall be separately billed or surcharged on a time and materials basis: (a) emergency Services performed at Customer's request, if inspection does not reveal any deficiency covered by this TSP Agreement; (b) Services performed other than during SBT's normal working hours; and (c) Service performed on equipment not covered by this TSP Agreement.

3.2 Invoices are due upon receipt or otherwise as may be set forth therein. If any payment is not received when due, SBT may deem Customer to be in breach hereof and may enforce any remedies available to it hereunder or at law, including without limitation suspension or termination of Services and acceleration of payments. Any amount not paid within sixty (60) days of the date due shall accrue interest from the date due, until paid, at the rate of ten percent (10%) per annum. In the event of a dispute by Customer regarding any portion or all of an invoiced amount, the undisputed portion shall be paid when due, and interest on the disputed, unpaid portion shall accrue as aforesaid, from the date due until the date of payment, to the extent that such amounts are finally determined to be payable to SBT.

3.3 Customer is responsible for paying any present or future sales, use, occupancy, excise or other federal, provincial, or local tax due or owing as a result of this TSP Agreement.

Article 4: Allocation of Risk

4.1(a) Until one year from either the date hereof or the date the Equipment is installed, whichever first occurs, all equipment manufactured by SBT or bearing its nameplate will be free from defects in material and workmanship arising from normal use and service.

Labor for all Services under this TSP Agreement is warranted for 90 days after the work is performed.

4.2(a) The limited warranties set forth in Section 4.1 will be void as to, and shall not apply to, any Equipment (i) repaired, altered or improperly installed by any person other than SBT or its authorized representative; (ii) subjected to unreasonable or improper use or storage, used beyond rated conditions, operated other than per SBT's or the manufacturer's instructions, or otherwise subjected to improper maintenance, negligence or accident; (iii) damaged because of any use of the Equipment after Customer has, or should have, knowledge of any defect in the Equipment; or (iv) not manufactured, fabricated and assembled by SBT or not bearing SBT's nameplate. However, SBT

assigns to Customer, without recourse, any and all assignable warranties available from any manufacturer, supplier, or subcontractor of such Equipment.

(b) Any claim under the limited warranty granted above must be made in writing to SBT within thirty (30) days after discovery of the claimed defect unless discovered directly by SBT. Such limited warranty only extends to Customer and not to any subsequent owner of the Equipment. Customer's sole and exclusive remedy for any Equipment or Services not conforming with this limited warranty is limited to, at SBT's option, (i) repair or replacement of defective components of covered Equipment, or (ii) reperformance of the defective portion of the Services, or (ii) to the extent previously paid, the issuance of a credit or refund for the original purchase price of such defective component or potion of the Equipment or Services.

(c) SBT shall not be required to repair or replace more than the component(s) of the Equipment actually found to be defective. SBT's warranty liability shall not exceed the purchase price of such item. Repaired or replaced Equipment will be warranted hereunder only for the remaining portion of the original warranty period.

4.3 THE EXPRESS LIMITED WARRANTIES PROVIDED ABOVE ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, STATUTORY, EXPRESS, OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED. SBT MAKES NO WARRANTY, EXPRESS OR IMPLIED, THAT ANY EQUIPMENT PROVIDED HEREUNDER WILL PREVENT ANY LOSS, OR WILL IN ALL CASES PROVIDE THE PROTECTION FOR WHICH IT IS INSTALLED OR INTENDED. THE LIMITED EXPRESS WARRANTIES AND REPRESENTATIONS SET FORTH IN THIS TSP AGREEMENT MAY ONLY BE MODIFIED OR SUPPLEMENTED IN A WRITING SIGNED BY A DULY AUTHORIZED CORPORATE OFFICER OF SBT.

4.4 SBT will indemnify Customer from and against losses, claims, expenses and damages (including reasonable attorney's fees) for personal injury or physical damage to property, but not loss of use of the property resulting from such damage or from damage to any work performed hereunder. Such indemnification shall be solely to the extent caused by or arising directly from SBT's or its employees', consultants' or agents' negligent acts or omissions or willful misconduct in connection with its performance of Services hereunder. SBT's obligations under this indemnity provision shall not extend to claims, losses, expenses and damages arising out of or in any way attributable to the negligence of Customer or its agents, consultants or employees other than SBT. SBT's liability to Customer or any third party under this Section or otherwise under the TSP Agreement is expressly limited to, and SBT shall not be liable other than for the direct losses, claims, expenses and damages arising as aforesaid. SBT shall in no event be responsible under this TSP Agreement for incidental, consequential, punitive, exemplary or special damages, including without limitation lost profits and/or lost business opportunities, whether arising in warranty, late or non-delivery of any Equipment or Services, tort, contract or strict liability, and regardless of whether SBT has been advised of the possibility of such damages. SBT reserves the right to control the defense and settlement of any claim for which SBT has an obligation to indemnify hereunder. The parties acknowledge that the price for which SBT has agreed to perform its Services and obligations under this TSP Agreement has been calculated based upon the foregoing limitations of liability, and that SBT has expressly relied on, and would not have entered into this TSP Agreement but for, such limitations of liability.

Article 5: Environmental

5.1 Except as disclosed pursuant to Section 5.3, Customer represents that there is no asbestos or any other hazardous or toxic materials, as defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, the regulations promulgated thereunder, and other applicable federal, state or local law ("Hazardous Materials"), present at Customer's locations where Services are performed. SBT will notify Customer immediately if it discovers or suspects the presence of any Hazardous Material. All Services have been priced and agreed to by SBT in reliance on Customer's representations as set forth in this Section 5.1 The presence of Hazardous Materials constitutes a change in the Proposed Solution equivalent to a change order whose terms must be agreed to by SBT before its obligations hereunder will continue.

5.2 Customer shall be solely responsible for testing, abating, encapsulating, removing, remedying or neutralizing such Hazardous Materials, and for the costs thereof. Even if an appropriate change order has been entered into pursuant to Section 5.1 above, SBT will continue to have the right to stop providing Services until the job site is free from Hazardous Materials. In such event, SBT will receive an equitable extension of time to complete its Services, and compensation for delays caused by Hazardous Materials remediation.

5.3 Customer warrants that, prior to the execution of the TSP Agreement, it has notified SBT in writing of any and all Hazardous Materials present, potentially present or likely to become present at Customer's locations and has provided a copy of any jobsite safety policies, including but not limited to lock-out and tag procedures, laboratory procedures, chemical hygiene plan, material safety data sheets, and other items covered or required to be disclosed or maintained by federal, state, or local laws, regulations or ordinances.

5.4 Customer hereby indemnifies and holds harmless SBT from and against any damages, losses, costs, liabilities or expenses arising from Customer's breach of, or failure to perform its obligations under, Sections 5.1, 5.2 or 5.3 above.

Article 6: Customer Responsibilities

6.1 Customer will operate and maintain all Equipment in accordance with applicable manufacturer's specifications, including those set forth in the manufacturer's operating manuals or instructions, as well as all requirements of applicable law or of authorities having jurisdiction. Such Equipment shall be operated only in the specified operating environment, which shall be supplied by Customer, including without limitation: (a) suitable electrical service, including clean, stable, properly conditioned power, to all Equipment; (b) telephone lines, capacity and connectivity as required by such Equipment; and (c) heat, light, air conditioning or other environmental controls, and other utilities in accordance with the specifications for the Equipment. Failure to so operate the Equipment will terminate immediately any maintenance obligations SBT may have hereunder.

6.2 Customer will promptly notify SBT of any unusual operating conditions, system malfunctions or building changes that may affect the Equipment or any Services.

6.3 Customer will provide SBT with reasonable means of access to the Equipment and shall make any necessary provisions to reach the Equipment and peripheral devices. Customer will be solely responsible for any removal, replacement or refinishing of the building structure or finishes that may be required to gain access to such Equipment.

6.4 Customer shall properly dispose of all ballasts, mercury bulb thermostats, used oil, contaminated filters, contaminated absorbents, refrigerant and any other Hazardous Materials that at any time are present at Customer's premises, in accordance with all applicable federal, state, and local laws, regulations, and ordinances. At no time and under no circumstances will SBT be responsible for any such removal or disposal and Customer hereby indemnifies and holds SBT harmless from and against any liability or claim arising therefrom.

6.5 Customer will, if applicable, provide and pay for a dedicated voice grade dial-up phone line and install a terminal block in a mutually agreed upon location. All on-line service Equipment (not including the phone line) will remain the property of SBT unless otherwise stated herein.

Article 7: Limitations of Maintenance or Service Obligations

7.1 SBT will not be responsible for the maintenance, repair or replacement of, or Services necessitated by reason of: (a) non-maintainable, non-replaceable, or obsolete parts of the Equipment, including but not limited to ductwork, shell and tubes, heat exchangers, coils, unit cabinets, casings, refractory material, electrical wiring, water and pneumatic piping, structural supports, cooling tower fill, slats and basins, etc. unless otherwise specifically stated herein; or (b) negligence, abuse, misuse, improper or inadequate repairs or modifications, improper operation, lack of operator maintenance or skill, failure to comply with manufacturer's operating and environmental requirements, Acts of God, or other reasons beyond its control. SBT assumes no responsibility for any service performed on any Equipment other than by SBT or its agents.

7.2 SBT shall not be responsible for loss, delay, injury or damage that may be caused by circumstances beyond its control, including but not restricted to acts or omissions by Customer or its employees or agents, Acts of God, war, civil commotion, acts of government, fire, theft, corrosion, flood, water damage, lightning, freeze-ups, computer viruses, program or system hackers, strikes, lockouts, differences with workmen, riots, explosions, quarantine restrictions, delays in transportation, or shortage of vehicles, fuel, labor or materials.

7.3 SBT is not responsible for repairs, replacements or services to Equipment due to corrosion, erosion, improper or inadequate water treatment by others, electrolytic action, chemical action or other reasons beyond its reasonable control.

7.4 SBT shall not be responsible for the removal or reinstallation of replacement valves, dampers, waterflow and tamper switches, airflow stations, and any other permanently mounted integral pipe or air duct component. Additionally, SBT shall not be responsible for any venting or draining of systems.

SIEMENS

Siemens Building Technologies
Technical Support Program

List of Maintained Equipment

Equipment Category	Equipment SubCategory	Equipment	Qty	Serial Number	Location	Mfg/Model
Built Up Units - AHU's	CW Coil	11 - 20 GPH	4			
Services (Times per year): Evap/Cooling Coil Clng (1.0), Operating Insp - Cool (3)						
Built Up Units - AHU's	CW Coil	21 - 40 GPH	2			
Services (Times per year): Evap/Cooling Coil Clng (1.0), Operating Insp - Cool (3)						
Built Up Units - AHU's	Fan System \ Centrifugal	11 - 15 HP	2			
Services (Times per year): HVAC Air Filter Change (4.0), Operating Insp - Heat (3), Seasonal Insp - Heat (1.0)						
Built Up Units - AHU's	Fan System \ Centrifugal	25 - 49 HP	2			
Services (Times per year): HVAC Air Filter Change (4.0), Operating Insp - Heat (3), Seasonal Insp - Heat (1.0)						
Built Up Units - AHU's	Fan System \ Centrifugal	6 - 10 HP	2			
Services (Times per year): HVAC Air Filter Change (4.0), Operating Insp - Heat (3), Seasonal Insp - Heat (1.0)						
Built Up Units - AHU's	HW Coil	11 - 20 GPH	4			
Services (Times per year): Evap/Cooling Coil Clng (1.0), Operating Insp - Heat (3)						
Built Up Units - AHU's	HW Coil	21 - 40 GPH	2			
Services (Times per year): Evap/Cooling Coil Clng (1.0), Operating Insp - Heat (3)						
Chillers / Screws	Water Cooled	Water Cool - 100 - 200 Tons	2			
Services (Times per year): Annual Maintenance (1.0), Oil Acid Test (1.0), Operating Inspection (3), Refrigerant Oil Analysis (1.0)						
Cooling Towers	Prop Fan - Belt Driven	0 - 199 Tons \ 11 - 15 HP	2			
Services (Times per year): Cooling Tower Cleaning (1.0), Operating Inspection (3)						
Heating Systems	HW - Boilers	3.6 - 7.0 MTBU/H	1			
Services (Times per year): Fireside Tube Brush Clng (1.0), Operating Inspection (3), Shut Down/Annual Insp (1.0), Start-Up Inspection (1.0)						

Equipment Category	Equipment SubCategory	Equipment	Qty	Serial Number	Location	Mfg/Model
Pumps	Pumps	Centrifugal 25 - 49 HP	5			
Services (Times per year): Operating Inspection (3), Start-Up Inspection (1.0)						
Stand Alone	Fan Coils	Fan Coil - Elect	28			
Services (Times per year): Operating Insp - Heat (4)						
Stand Alone	Exhaust Fans	0 - 5 HP	22			
Services (Times per year): Seasonal Insp - Heat (1.0)						
Stand Alone	Make Up Air Units - A/C Only	16 - 24 Tons	3			
Services (Times per year): Air Cooled Cndnser Coil (2.0), Evap/Cooling Coil Clng (1.0), HVAC Air Filter Change (4.0), Operating Insp - Cool (3), Seasonal Insp - Cooling (1.0)						

Filter Schedule

Siemens Building Technologies, Inc.
Technical Support Program

Filter Schedule

Equipment	Filter Size	Type	Qty/Change	Changes/yr

Discounted Labor & Material Pricing

As a Technical Support Program customer with an active agreement, you will receive the benefit of a discount from our standard labor rates and material prices. Standard rates and preferred customer rates are documented below.

Please note: Rates shown are effective for the period identified. Rates are subject to change and are adjusted annually.

Effective from	**January 1, 2003**	**through**	**December 31, 2003**

Standard Labor Rates:	**Straight Time** (M-F 8 AM to 5 PM) excl. Holidays	**Regular Overtime** (M-F 5 PM to 8 AM, & Sat)	**Sunday & Holiday**
Automation Specialist	**$.00**	**$.00**	**$.00**
Engineer	**$.00**	**$.00**	**$.00**
Mechanic	**$.00 (plus $.00 truck charge)**	**$.00 (plus $.00 truck charge)**	**$.00 (plus $.00 truck charge)**

Preferred Customer Labor Rates:	**Straight Time** (M-F 8 AM to 5 PM) excl. Holidays	**Regular Overtime** (M-F 5 PM to 8 AM, & Sat)	**Sunday & Holiday**
Automation Specialist	**$ .00**	**$.00**	**$.00**
Engineer	**$ .00**	**$ .00**	**$.00**
Mechanic	**$.00 (plus $.00 truck charge)**	**$ .00 (plus $.00 truck charge)**	**$.00 (plus $.00 truck charge)**

Minimum Charge: Service involving travel to the customer site will incur a two-hour minimum labor charge and $0.60 per mile one-way vehicle charge. On-line diagnostic and other remote services, as well as consulting services provided by phone, will be charged at the engineering rate with a two-hour minimum.

Material Rates: Customers with a current Technical Support Program will receive a discount of 40% less 20% off list on standard catalog pricing for Siemens Building Technologies product except products listed in the catalog with the @ sign which are limited to a 40% discount.

Appendix