



August 15, 2016

MEMORANDUM

TO: District Board of Trustees

FROM: Jim Murdaugh, President 

SUBJECT: Energy Savings Performance Contract

Item Description

Presented for Board approval is an energy savings performance contract with Siemens Industry, Inc.

Overview and Background

In order to complete an extensive facility improvement program, the College desires to enter into an energy savings performance contract with Siemens. The College has established several requirements of this contract, including recognizing sufficient cost reductions from current utility expenses to cover the costs required to obtain a capital project loan. The energy savings performance contract will also be structured to not require the use of any existing operational budget, affording the College an opportunity to achieve an energy-efficient campus without risking our limited facilities budget. The Florida Department of Management Services Energy Savings State Term Contract #973-320-081 identified qualified energy savings contractors. TCC reviewed the list of ten contractors, requested additional information from three vendors, including presentations and under the state term contract, selected Siemens for negotiation, as they best met our needs.

Past Actions by the Board

The Board has not taken any previous action related to this project.

Funding/Financial Implications

The College will secure a loan in an amount not to exceed \$7,082,476 in order to make the infrastructure improvements in this contract. We will be obligated to an annual variable debt service payment for 16 years. However, with projected average annual savings from reduced utility and operational costs of \$623,131, the savings recognized by the College for this project will exceed the annual debt payments. Therefore there are no projected costs to the College.

Staff Resource

Barbara Wills

Recommended Action

Approve the Siemens Energy Savings Performance Contract as presented to the Board.

PERFORMANCE CONTRACTING AGREEMENT

between

**Tallahassee Community College Board of Trustees,
acting for and on behalf of Tallahassee Community
College and
Siemens Industry, Inc.,
Building Technologies Division**

TABLE OF ARTICLES

1. Agreement
2. Glossary
3. General
4. Performance Guarantee
5. Work by SIEMENS
6. The CLIENT's Responsibilities
7. Changes and Delays
8. Compensation
9. Acceptance
10. Insurance and Allocation of Risk
11. Hazardous Material Provisions
12. Miscellaneous Provisions
13. Maintenance Services Program

PERFORMANCE CONTRACTING AGREEMENT

Number: _____

Article 1 AGREEMENT

THIS **PERFORMANCE CONTRACTING AGREEMENT** ("Agreement") is made this _____ day of June, 2016 (the "Effective Contract Date", defined below), by and between Siemens Industry, Inc., Building Technologies Division ("SIEMENS") and the party identified below as the CLIENT.

The CLIENT: Tallahassee Community College Board of Trustees, acting for and on behalf of Tallahassee Community College

DESIGNATED REPRESENTATIVE: Don Herr
PHONE: 850-201-6168 FAX: 850-201-8184

Siemens Industry, Inc., Building Technologies Division
1000 Deerfield Parkway
Buffalo Grove, Illinois 60089

With offices at: 119 Hamilton Park Drive, #6
Tallahassee, FL
32304

DESIGNATED REPRESENTATIVE: Marc Craddock
PHONE: 407-718-8774 FAX: 850-504-0343

For Work and Services in connection with the following project (the "Project"):

Tallahassee Community College - Performance Contracting Project – Work Package 1

The CLIENT considered performing the following FIMs but at this time, has determined to exclude them from the Scope of Work and Services, Exhibit A, but may be included in a Future Work Package:

- Ghazvini Water Conservation
- Main Campus Ball Field Lighting
- Main Campus & FPSI HVAC Upgrades

PERFORMANCE CONTRACTING AGREEMENT

Articles and Attachments

This Agreement consists of this document, which includes the following articles and exhibits which are acknowledged by the CLIENT and SIEMENS and incorporated into the Agreement by this reference:

Articles

1. Agreement
2. Glossary
3. General
4. Performance Guarantee
5. Work BY SIEMENS
6. The CLIENT's Responsibilities
7. Changes and Delays
8. Compensation
9. Acceptance
10. Insurance and Allocation of Risk
11. Hazardous Material Provisions
12. Miscellaneous Provisions
13. Maintenance Services Program

Exhibits

Exhibit A	Scope of Work and Services
Exhibit B	Payment Schedule(s)
Exhibit C	Performance Assurance
Exhibit D-1	Certificate of Substantial Completion
Exhibit D-2	Certificate of Final Completion
Exhibit E	Direct Purchase Procedure
Appendix 1	Boiler Design Documents
Appendix 2	Building Automation Specifications and Cut Sheets
Appendix 3	Lighting Retrofit Specifications and Cut Sheets
Appendix 4	Lighting Occupancy Sensor Specifications and Cut Sheets
Appendix 5	Water Conservation Specifications and Cut Sheets
Appendix 6	Owner Direct Purchase Equipment List
Appendix 7	Main Campus Chiller Plant Upgrades

This Agreement, when executed by an authorized representative of the CLIENT and authorized representatives of SIEMENS, constitutes the entire, complete and exclusive agreement between the Parties relative to the project scope stated in Exhibit A. This Agreement supersedes all prior and contemporaneous negotiations, statements, representations, agreements, letters of intent, awards, or proposals, either written or oral relative to the same, and may be modified only by a written instrument signed by both Parties.

PERFORMANCE CONTRACTING AGREEMENT

COMPENSATION/TERMS OF PAYMENT:

As full consideration for the performance of the Work and Services set forth in Exhibit A, and for the Performance Assurance set forth in Exhibit C, the CLIENT shall pay SIEMENS in such manner and amounts as agreed to in Exhibit B.

Agreed for **Tallahassee Community College Board of Trustees, acting for and on behalf of Tallahassee Community College**

(Signature) by: _____

Print Name and Title: _____

(Signature) by: _____

Print Name and Title: _____

Agreed for **Siemens Industry, Inc.**

(Signature) by: _____

Print Name and Title: _____

(Signature) by: _____

Print Name and Title: _____

Article 2

Glossary

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

“Acceptance” means the CLIENT has signed, or is deemed to have signed, a Certificate of Substantial Completion.

“Acceptance Date” means the date on which the CLIENT signs or is deemed to have signed a Certificate of Substantial Completion.

“Annual Performance Assurance Report” means the document prepared by SIEMENS and submitted to the CLIENT as part of the Performance Assurance Service Program, which identifies the Savings achieved for the applicable Annual Period.

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

“Annual Realized 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.

“Applicable Law” means laws, ordinances, codes, rules and regulations applicable to the Work and in effect on the Effective Contract Date.

“Baseline” means the measurements of Facility energy usage taken prior to the Effective Contract Date, and the Facility operating practices in effect prior to the Effective Contract Date, as set forth in the Performance Assurance, Exhibit C.

“Baseline Period” means the period of time from which data is provided to SIEMENS to derive the Baseline measurements. The Baseline Period is set forth in the Performance Assurance, Exhibit C.

“BTU” means a British Thermal Unit and is a unit of thermal energy.

“Capital Off-Set Savings” means a sub-category of Operational Savings where Savings will result in a cost effective upgrade to the Facility to address one or more of the following issues: potential future increased costs, comfort, code non-compliance, usage requirements, user needs and/or expectations.

“Certificate of Substantial Completion” means the document indicating that the Work, or a designated portion of the Work, is Substantially Complete in accordance with the Agreement.

“CLIENT Representative” means the person identified to SIEMENS by the CLIENT as the person authorized to make decisions on behalf of the CLIENT as set forth in Section 6.1(a) hereof.

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

PERFORMANCE CONTRACTING AGREEMENT

“Construction Period Savings” means the actual accumulated Measured & Verified Savings plus the Stipulated Savings achieved from the Effective Contract Date until the Guarantee Date.

“Contracted Baseline” means the post-FIM-implementation Facility operating profile based on parameters described in Exhibit C, which the CLIENT shall maintain throughout the Performance Guarantee Period and are relied upon by SIEMENS for the calculation of Guaranteed Savings as provided in the Performance Assurance, Exhibit C. The Contracted Baseline must also include stipulated hours of operation and plug-loads for all Facilities, and must include stipulated blended, or non-blended, utility rates.

“Deferred Maintenance” means a sub-category of Operational Savings where Savings result from a reduction of current or potential future repair and maintenance costs due to certain work being performed hereunder where such work had been previously postponed.

“Deliverables” shall mean collectively, (a) any Equipment and any Software Product deliverable to CLIENT from SIEMENS under or in connection with the Work, and (b) any Work Product Deliverables.

“Effective Contract Date” is the date appearing at the top of this Agreement, unless specifically indicated otherwise.

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

“Equipment” means the installed physical equipment to be provided by SIEMENS as described in the Scope of Work and Services, Exhibit A.

“Escalation Rate” means an annual percentage increase to be applied to the previous year’s energy savings, operational savings and service pricing, beginning and occurring on dates outlined in the Performance Assurance, Exhibit C. A different Escalation Rate may be applied to differing Savings calculations and/or payment schedules depending on the percentage agreed upon by the Parties.

“Facility” or **“Facilities”** means the building(s) or structure(s) where Work will be installed or implemented.

“Facility Improvement Measures” or **“FIMs”** means the (i) Instruments, know-how and Intellectual Property, including but not limited to methods and techniques for energy conservation, owned or licensed by SIEMENS and employed by SIEMENS to perform the Work and Services under this Agreement; and, (ii) the installation of Equipment and Software Products with the intent of generating net savings or efficiencies at or in connection with the operation of the Facilities. A FIM may include one or multiple ECMs as well as any non-conservation-related activities, means or methods.

“FEMP” means the Federal Energy Management Program managed by the United States Department of Energy.

“FEMP Guidelines” means the FEMP M&V Guidelines v. 3.0 published by FEMP as *M&V Guidelines; Measurement and Verification for Federal Energy Management Projects*.

“Guarantee Date” means the first day of the month following the date on which the CLIENT executes the final Certificate of Substantial Completion, thus indicating that the Construction Period is complete.

“Guaranteed Annual Savings” are the Guaranteed Measured & Verified Savings plus the Stipulated Savings that SIEMENS guarantees will be achieved in an Annual Period of the Performance Guarantee Period.

“Guaranteed Measured & Verified Savings” means the Measured & Verified Savings that SIEMENS guarantees will be achieved, as described in the Performance Assurance, Exhibit C.

“Guaranteed Savings” means the amount of Savings that SIEMENS guarantees will be achieved at the Facility during the Performance Guarantee Period. as identified in the Performance Assurance, Exhibit C as subject to the limitation identified in Section 4.8.

“Hazardous Materials” refers to the definition found in Section 11.1.

“Instruments” means all know-how, tools and related documentation owned or licensed by SIEMENS and used by SIEMENS to install or commission Equipment and Software Products for operation at the Facility, including but not limited to tools for installing any Software Products in Equipment, performing diagnostics on Equipment as installed in the Facility as well as any reports, notes, calculations, data, drawings, estimates, specifications, manuals, documents, all computer programs, codes and computerized materials prepared by or for SIEMENS and used by SIEMENS to provide an ECM or a FIM. Instruments excludes Work Product Deliverables.

“Intellectual Property Rights” or **“Intellectual Property”** means all trade secrets, patents and patent applications, trade marks (whether registered or unregistered and including any goodwill acquired in such trade marks), services marks, trade names, internet domain names, copyrights (including rights in computer software), moral rights, database rights, design

PERFORMANCE CONTRACTING AGREEMENT

rights, rights in know-how, rights in inventions (whether patentable or not) including, but not limited to, any and all renewals or extensions thereof, and all other proprietary rights (whether registered or unregistered, and any application for the foregoing), and all other equivalent or similar rights which may subsist anywhere in the world, including, but not limited to, any and all renewals or extensions thereof.

“IPMVP” means the International Performance Measurement and Verification Protocol, Volume 1, EVO 10000-1.2007 as prepared by the Efficiency Valuation Organization.

“kW” and “kWh” means kilowatt and kilowatt hour, respectively.

“Maintenance Services Program” or “MSP” means the Services performed by SIEMENS to maintain the Equipment in good working order. The MSP may also contain Services unrelated to the maintenance of the Equipment. If applicable, the MSP is more fully described in the Scope of Work and Services, Exhibit A.

“Material Change” means a measurable deviation in the Contracted Baseline such that there is an adverse impact on the Annual Realized Savings which results or will result in a Savings Shortfall.

“Measured & Verified Savings” means those Savings that can be calculated and ascertained by the methodology set forth in the Performance Assurance, Exhibit C.

“Oil” refers to the definition found in Section 11.1.

“Operational Savings” means Savings derived from reduced operational expenses, including but not limited to, Deferred Maintenance, or Capital Off-Set Savings. Operational Savings can only be expressed in monetary value and are Stipulated Savings.

“Parties” means the CLIENT and SIEMENS.

“Performance Assurance” is the process of ascertaining whether the FIMs are performing at the level necessary to achieve the Guaranteed Savings.

“Performance Assurance Services Program” or “PASP” means the Services required to monitor the operation of the FIMs so that SIEMENS can provide the Annual Performance Assurance Report detailing the Annual Realized Savings and comparing the same to the Annual Guaranteed Savings based upon the calculations agreed to by the Parties in the Performance Assurance, Exhibit C. The Services provided under the PASP are described in the Scope of Work and Services, Exhibit A.

“Performance Guarantee” means the guarantee that SIEMENS makes to the CLIENT which is reconciled and confirmed through the Performance Assurance process set forth in the Performance Assurance, Exhibit C.

“Performance Guarantee Period” means the timeframe from the Guarantee Date to the last day of the final Annual Period as described in Table 1.1 of the Performance Assurance, Exhibit C, or the period from the Guarantee Date until the termination of this Agreement, whichever occurs earlier.

“Permitted Users” means the CLIENT, its employees and agents.

“Savings” means the Parties’ intended result from implementing all FIMs. Savings can be derived from reductions in energy or utility consumption, reductions in operating expenses, a changed utility rate classification or a combination thereof. The Savings that are achieved from reduced energy or utility consumption are converted to a dollar figure based upon the calculation in Article 4.1.1 and as detailed in the Performance Assurance, Exhibit C. When converted to a dollar figure, these Savings become energy cost savings. Operational Savings are only expressed in a dollar figure.

“Savings Shortfall” means the Annual Realized Savings less the Guaranteed Annual Savings for the Annual Period resulting in an amount less than zero.

“Services” means those services to be provided by SIEMENS as described in the Scope of Work and Services, Exhibit A.

“SIEMENS Pre-existing Intellectual Property” means any Intellectual Property: (i) that has been conceived or developed by an employee or subcontractor of SIEMENS before SIEMENS performs any Work or Services under this Agreement; (ii) that is conceived or developed by such employee or subcontractor at any time wholly independently of SIEMENS performing the Work under this Agreement; or, (iii) if developed while performing the Work under this Agreement, where the development of Intellectual Property for the benefit of the CLIENT is not expressly identified as a FIM or part of a FIM. SIEMENS Pre-existing Property is included in all reports, notes, calculations, data, drawings, estimates, specifications, manuals, documents, all computer programs, codes and computerized materials prepared by or for SIEMENS.

“SIEMENS Product” means a product, including Software Product and/or Equipment, offered for sale or license by SIEMENS or its affiliates or subsidiaries and developed prior to performing the Work or SIEMENS rendering services in connection with this Agreement. A SIEMENS Product also includes improvements or modifications to any Equipment and

PERFORMANCE CONTRACTING AGREEMENT

any Software Product developed by SIEMENS or developed as part of the Work, including any SIEMENS Product that is configured or modified for operation at a site specified by the CLIENT. Any information that is provided by the CLIENT and incorporated into a SIEMENS Product is not, by itself, a SIEMENS Product. A compilation of such information and the product of such compilation, however, is a SIEMENS Product.

“Software Product” means any software that is owned or licensed by SIEMENS or its affiliates and that is either separately deliverable for use in the Equipment or for use in a computer system owned by the CLIENT or delivered as firmware embedded in the Equipment.

“Stipulated Savings” are a sub-category of Guaranteed Savings that do not require post-FIM implementation measurement and verification because they are agreed upon by the Parties based upon representations made to SIEMENS by the CLIENT and through the application of generally accepted analytical formulae. As such, Stipulated Savings are agreed upon in advance by the Parties and cannot be changed. When used as a methodology for representing a FIM’s energy savings, such methodology is not recognized as a measurement and verification methodology under IPMVP. Therefore, where the IPMVP measurement methodologies are required, a methodology other than Stipulated Savings must be used to calculate energy savings.

“Substantial Completion” or **“Substantially Complete”** means 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 and Services, Exhibit A, such that the CLIENT will be able to realize from such Work substantially all of the practical benefits intended to be gained therefrom, or otherwise employ the Work or the FIMs for their intended purposes. To the extent that the Work requires multiple Acceptances, the Work’s final Substantial Completion date shall determine the Guarantee Date.

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

“Total Guaranteed Savings” means the sum of the Savings that are guaranteed for all Annual Periods during the Performance Guarantee Period (inclusive of the Construction Period, if applicable). The Total Guaranteed Savings are reflected in Tables 1.1 and 1.2 in the Performance Assurance, Exhibit C.

“Work” means collective labor, Equipment and services comprising the FIMs to be performed by SIEMENS, as described in the Scope of Work and Services, Exhibit A.

“Work Product Deliverable” means the tangible form of a report or drawing specifically developed for, commissioned by and deliverable to the CLIENT in connection with the Work to be performed by SIEMENS under this Agreement.

Article 3

General

- 3.1 The Parties hereto acknowledge and agree that this Agreement has been negotiated at arm’s length and among the Parties equally sophisticated and knowledgeable as to the subject matter of this Agreement. Each party has conferred, or has had the opportunity to confer, with their respective legal counsel. Accordingly, in the event any claim is made relating to any conflict, omission, or ambiguity in this Agreement, no presumption, burden of proof, or persuasion shall be implied by virtue of the fact that this Agreement was drafted by or at the request of a particular party or its legal counsel.
- 3.2 The CLIENT hereby engages and SIEMENS hereby accepts the engagement to perform and to provide the Work and Services set forth in Exhibit A in accordance with the terms and conditions of this Agreement.
- 3.3 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 the CLIENT. This Agreement is not intended, and shall not be construed to create, between the 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 the CLIENT.
- 3.4 SIEMENS represents, warrants and covenants to the CLIENT that:
 - (a) It has all requisite corporate power 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 SIEMENS’s organizational documents, any Applicable Law, 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;

PERFORMANCE CONTRACTING AGREEMENT

- (c) This Agreement is the legal, valid and binding obligation of SIEMENS, in accordance with its terms, and all requirements have been met and procedures have been followed by SIEMENS to ensure the enforceability of the Agreement;
- (d) To SIEMENS's best knowledge, there is no pending or threatened, suit, action, litigation or proceeding against or affecting SIEMENS that affects the validity or enforceability of this Agreement; and,
- (e) It is duly authorized to do business in all locations where the Work and Services are to be performed.

3.5 The CLIENT represents, warrants and covenants to SIEMENS that:

- (a) It has all requisite corporate power and/or 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 the CLIENT's organizational documents, any Applicable Law, 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 the CLIENT to ensure the enforceability of the Agreement;
- (d) To the CLIENT's best knowledge, there is no pending or threatened, suit, action, litigation or proceeding against or affecting the CLIENT that affects the validity or enforceability of this Agreement; and,
- (e) The CLIENT has consulted with its legal counsel and is relying on the advice of its counsel concerning all legal issues related to this Agreement, and is not relying on SIEMENS in this regard.

Article 4

Performance Guarantee

4.1 The Annual Realized Savings generated during each Annual Period will be no less than the Guaranteed Annual Savings as shown in Tables 1.1 and 1.2 of the Performance Assurance, Exhibit C, subject to the limits in Section 4.8. The measurement and verification calculation methodology for determining the Savings is set forth in the Performance Assurance, Exhibit C.

4.1.1 General. Except as otherwise provided, energy savings will be calculated for each month of each Annual 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 calculated by 1) assuming the Contracted Baseline has been maintained per Section 4.3 below, and 2) subtracting the then current period measured units of energy consumed from the Baseline units of energy defined in Article 5 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 Rates to be applied to utility, energy or other costs are set forth in Exhibit C. SIEMENS and the CLIENT agree that the Baseline data set forth in Exhibit C is a full and accurate reflection of the existing Facility, equipment, operation, business use and energy usage, and that such Baseline data will be the basis on which all future energy use will be compared in order to determine the Annual Realized Savings.

4.3 SIEMENS and the CLIENT agree that the Contracted Baseline fully described 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 operates and maintains its Facilities within the Contracted Baseline parameters, as may be adjusted in accordance with the terms herein, during the entire term of the Performance Guarantee Period.

4.4 The CLIENT agrees to notify SIEMENS prior to or within thirty (30) days of CLIENT's knowledge of any Material Change.

4.5 Within thirty (30) days of notice of a Material Change, SIEMENS's discovery of a Material Change and with prompt notice to CLIENT, SIEMENS will either:

- (a) Require an adjustment to the Performance Assurance and the Performance Guarantee as a result of the Material Change; or,
- (b) Where a commercially reasonable adjustment to the Performance Guarantee is unavailable, terminate both the Performance Assurance and the Performance Guarantee.

4.6 A Performance Guarantee Period savings reconciliation as identified in Section 4.1 will be performed at the end of each Annual Period as follows:

PERFORMANCE CONTRACTING AGREEMENT

- (a) Within ninety (90) days of the Guarantee Date, the Construction Period Savings shall be reconciled and applied to the calculation of the first Annual Period's Annual Realized Savings.
 - (b) At the conclusion of each Annual Period, SIEMENS will calculate the Annual Realized Savings and compare the calculated amount to the applicable Guaranteed Annual Savings amount.
 - (c) Where the Annual Realized Savings are less than the Guaranteed Annual Savings, a Savings Shortfall shall be recorded for the applicable Annual Period.
 - (d) A Savings Shortfall shall be paid by SIEMENS within sixty (60) days following the CLIENT's acceptance of the reconciliation and once paid SIEMENS shall have fulfilled its obligations under the Performance Guarantee for the applicable Annual Period.
- 4.6.1 As the mutual goal of the Parties is to maximize Savings, if SIEMENS can correct a Savings Shortfall through an operational improvement at no expense or material inconvenience to the CLIENT and without 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 negated by deeming the value of the Savings Shortfall as Savings achieved and adding the amount of same to the Annual Realized Savings calculations for each Annual Period thereafter.
- 4.7 The Performance Guarantee is dependent upon and is subject to the express condition that the CLIENT maintains the PASP during the entire Performance Guarantee Period. If the CLIENT fails to maintain, breaches, cancels or otherwise causes the termination of the PASP then; (a) The Performance Guarantee shall terminate immediately and be void and of no force or effect; or, (b) Where termination of the Performance Guarantee acts to render the Agreement in violation of Applicable Law, all Guaranteed Savings thereafter shall be determined to have been achieved and SIEMENS shall have been deemed to have met its Performance Guarantee obligations under this Agreement for each and every Annual Period thereafter without the obligation to provide the CLIENT, or any third-party as the case may be, with any further Annual Performance Assurance Reports.
- 4.8 The payments and credits based on Savings Shortfalls, if any, are the sole remedy of the CLIENT under 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 EITHER SIEMENS AND/OR A THIRD-PARTY (IN THE EVENT THAT THE CLIENT HAS FINANCED THE TRANSACTION) FOR THE AGGREGATE OF: THE PRICE, AS DEFINED IN EXHIBIT B, ARTICLE 1.1; THE PASP PAYMENTS; THE MSP PAYMENTS, IF ANY; AND, IF APPLICABLE, THE CLIENT'S COST OF FINANCING THE WORK. The CLIENT's cost of financing the Work is the cost of financing calculated either: (a) On the date that the escrow account is funded in accordance with Exhibit B, Article 1.2; or, (b) On the Effective Contract Date if the escrow requirement is expressly waived by SIEMENS.
- 4.9 The CLIENT represents that all existing equipment that is not installed by SIEMENS under this Agreement but is deemed necessary to achieve the Performance Guarantee, is in satisfactory working condition. Prior to the beginning of the Performance Guarantee Period, SIEMENS will have inspected all such existing equipment and reported any deficiencies to the CLIENT. To the extent that the deficiencies are not remedied by the CLIENT prior to the Guarantee Date, the adverse affect on the ability of the Project to attain the necessary Guaranteed Savings shall be factored into the Annual Performance Assurance Report and, if necessary, the Performance Guarantee shall be adjusted accordingly.
- 4.10 If the Equipment or the existing equipment is altered or moved by any person (including the CLIENT) other than SIEMENS or a person authorized by SIEMENS, the 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 the CLIENT's expense in order to determine if a Material Change has occurred.
- 4.11 SIEMENS will have no liability or obligation to continue providing PASP Services or any Guaranteed Savings under the Performance Guarantee in the event that the CLIENT fails to:
- (a) Authorize a re-acceptance test or re-commissioning that SIEMENS reasonably deems necessary in order to determine if a Material Change has occurred;
 - (b) Provide access to any Facility where Work is to be performed;
 - (c) Service and maintain all Equipment in accordance with the manufacturers' recommendations in order to prevent a Savings Shortfall; or,

PERFORMANCE CONTRACTING AGREEMENT

- (d) Provide SIEMENS with accurate Facility operating information as soon as such information becomes reasonably available to the CLIENT, including energy usage and cost, executed preventive maintenance and repair records, building or equipment additions, and occupancy levels during each Annual Period.
- 4.12 Unless expressly contrary to Applicable Law, should the CLIENT decide to discontinue the PASP before the end of the Performance Guarantee Period, the CLIENT will give SIEMENS thirty (30) days prior written notice and in such notice indicate that the CLIENT has selected one of the following:
- (a) The CLIENT will re-invest the avoided cost of cancellation of the PASP into Facility improvements and services that improve the overall Facility's performance and which improvements and services are implemented by SIEMENS; or,
- 4.13 Unless expressly contrary to Applicable Law, any disputes concerning the calculation of the Annual Realized Savings or changes to the Contracted Baseline that are not resolved by negotiation between the Parties within thirty (30) days of the notice of the dispute, will be resolved by a third-party professional engineering firm which is reasonably acceptable to both SIEMENS and the CLIENT. The determination of such firm will be final and binding upon CLIENT and SIEMENS. SIEMENS and the CLIENT will each be responsible for half of the fees of such firm.

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 workmanlike manner.
- 5.2 SIEMENS shall perform the Work during its normal hours, Monday through Friday inclusive, excluding holidays, unless otherwise agreed herein. The CLIENT shall make the Facility available so Work may proceed in an efficient manner.
- 5.3 SIEMENS is not required to conduct safety, reacceptance or other tests, install new devices or equipment or make modifications to any Equipment unless expressly made a part of the Work identified in the Scope of Work and Services, Exhibit A. Any CLIENT request to change the scope or the nature of the Work or Services must be in the form of a mutually agreed change order, effective only when executed by the Parties.
- 5.4 All Work Product Deliverables shall become the CLIENT's property upon receipt by CLIENT. SIEMENS may retain file copies of such Work Product Deliverables. If any Instruments are provided to the CLIENT under this Agreement, any such Instruments shall remain SIEMENS property, including the Intellectual Property conceived or developed by SIEMENS in the Instruments. All SIEMENS Pre-existing Intellectual Property that may be included in the Deliverables provided to the CLIENT under this Agreement shall also remain SIEMENS's property including the SIEMENS Pre-existing Intellectual Property included in the Work Product Deliverables. All Work Product Deliverables and any Instruments provided to the CLIENT are for Permitted Users' use and only for the purposes disclosed to SIEMENS. SIEMENS hereby grants the CLIENT a royalty-free (once payments due under this Agreement are paid to SIEMENS), non-transferable, perpetual, nonexclusive license to use any SIEMENS Pre-existing Intellectual Property solely as incorporated into the Deliverables and SIEMENS' Intellectual Property as incorporated into any Instruments provided to the CLIENT under this Agreement. Under such license, and following agreement to be bound to such separate confidentiality provisions that may exist between the Parties, to the fullest extent permitted by law, Permitted Users shall have a right to:
- (a) Use, in object code form only, the Software Products included in the Deliverables ("Software Deliverables");
- (b) Make and retain archival and emergency copies of such Software Deliverables (subject to any confidentiality provisions) except if the Software Deliverable is embedded in the Equipment; and,
- (c) Use all such Deliverables and such Instruments, provided however, the Deliverables and 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 Deliverables are provided. All Deliverables provided to the CLIENT are for Permitted Users' use only for the purposes disclosed to SIEMENS, and the 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's express written consent.
- 5.4.1 Any reuse of such Deliverables or such 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' risk and without liability to SIEMENS.

PERFORMANCE CONTRACTING AGREEMENT

- 5.4.2 In consideration of such license, CLIENT agrees not to reverse engineer any Equipment or Software Product to reconstruct or discover any source code, object code, firmware, underlying ideas, or algorithms of such Equipment or Software Product even to the extent such restriction is allowable under Applicable Law.
- 5.4.3 Nothing contained in this Agreement shall be interpreted or construed to convey to the CLIENT the pre-existing Intellectual Property rights of any third party incorporated into the Deliverables. CLIENT agrees to take delivery of any Software Deliverables subject to any applicable SIEMENS or third party end-user license agreement accompanying such Software Deliverable.
- 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 the CLIENT or their work or to provide the means, methods or sequence of their work or to stop their work. SIEMENS's work and/or presence at the Facility shall not relieve others of their responsibility to the 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 PASP or MSP Services, is warranted to be free from defects in workmanship for one year after the Work is performed. PASP Services and MSP Services are warranted to be free from defects in workmanship for ninety (90) days after the Services are performed.
- 5.7 Warranty Limitation:
- (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) which the CLIENT or a third party subjects to unreasonable or improper use or storage, uses beyond rated conditions, operates other than per SIEMENS's or the manufacturer's instructions, or otherwise subjects to improper maintenance, negligence or accident; (iii) damaged because of any use of the Equipment after the CLIENT has, or should have had, knowledge of any defect in the Equipment; or (iv) not manufactured, fabricated and assembled by SIEMENS or not bearing SIEMENS's nameplate. However, SIEMENS assigns to the 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 the CLIENT and not to any subsequent owner of the Equipment. The CLIENT's sole and exclusive remedy for any Equipment or Services not conforming with this limited warranty is limited to, at SIEMENS's option: (i) repair or replacement of defective components of covered Equipment; (ii) re-performance of the defective portion of the Services; or (iii) to the extent previously paid and itemized, the issuance of a credit or refund for the original purchase price of such defective component or portion of the Equipment or Services.
 - (c) SIEMENS shall not be required to repair or replace more than the component(s) of the Equipment or the portion of the Work and Services actually found to be defective. SIEMENS's 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. THE LIMITED EXPRESS WARRANTIES AND REPRESENTATIONS SET FORTH IN THIS AGREEMENT MAY ONLY BE MODIFIED OR SUPPLEMENTED IN A WRITING EXECUTED BY A DULY AUTHORIZED SIGNATORY OF EACH PARTY.
- 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 covered by the warranty provisions herein or otherwise specifically stated herein; or
 - (b) The CLIENT's or a third-party's negligence, abuse, misuse, improper or inadequate repairs or modifications, improper operation, lack of operator maintenance or skill, corrosion, erosion, improper or inadequate water

PERFORMANCE CONTRACTING AGREEMENT

treatment, electrolytic action, chemical action, failure to comply with manufacturer's operating and environmental requirements, Acts of God, or other reasons beyond SIEMENS's 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 THAT PERFORMED BY SIEMENS OR ITS AGENTS.

Article 6

The CLIENT's Responsibilities

6.1 The CLIENT, without cost to SIEMENS, shall:

- (a) Designate a contact person with authority to make decisions for the CLIENT regarding the Work and provide SIEMENS with information sufficient to contact such person in an emergency;
- (b) Coordinate the work of contractors under CLIENT's sole control so as not to disrupt the Work and Services proceeding in an efficient manner;
- (c) Provide or arrange for 24 hour, 7 day per week access and make all reasonable provisions for SIEMENS to enter any Facility where Work is to be performed so that Work may proceed in an efficient manner. Notwithstanding the foregoing, all facility access outside of normal operating hours for Florida State University must be requested by SIEMENS one business day in advance except in the event of an emergency. All reasonable provisions will be made by CLIENT for SIEMENS to enter any Facility where work will be performed so that the work may proceed in an efficient manner;
- (d) Permit SIEMENS to control and/or operate all building controls, systems, apparatus, equipment and machinery necessary to perform the Work;
- (e) Furnish SIEMENS with blueprints, surveys, legal descriptions, waste management plans and all other available information pertinent to the Work and any Facility where the Work is to be performed as may be reasonably requested by SIEMENS. Such plans and blueprints, along with an executed copy of this Agreement, with its Exhibits, shall be kept and maintained in CLIENT's files for a period of fifteen (15) years from the Effective Contract Date;
- (f) 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;
- (g) In accordance with Article 11 hereof, promptly notify SIEMENS of all known or suspected Hazardous Materials at the Facility, of any contamination of the Facility 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;
- (h) Comply with Applicable Law 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;
- (i) 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 Facility where the Work is to be performed;
- (j) Furnish SIEMENS with any contingency plans, safety programs and other policies, plans or programs related to any Facility where the Work is to be performed;
- (k) 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 the 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;
- (l) Promptly notify SIEMENS of any unusual operating conditions, hours of usage, system malfunctions, installed equipment or building alterations that may affect the Equipment or energy usage or any Services; and,

PERFORMANCE CONTRACTING AGREEMENT

- (m) If applicable, provide and pay for a dedicated voice grade dial-up phone line, or a mutually agreed communication method, and install a terminal block, or an equivalent communication mechanism, in a mutually agreed upon location. All on-line service Equipment (excluding the phone line) will remain the property of SIEMENS unless otherwise stated herein.
- 6.2 Unless contrary to Applicable Law, the 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's express written consent, except as required by law.
- 6.3 The CLIENT acknowledges that it is now and shall at all times remain in control of the Facility. Except as expressly provided herein, SIEMENS shall not be responsible for the adequacy of the health or safety programs or precautions related to the CLIENT's activities or operations, the CLIENT's other contractor(s), the work of any other person or entity, or Facility conditions. SIEMENS shall not be responsible for inspecting, observing, reporting or correcting health or safety conditions or deficiencies of the CLIENT or others at the Facility. So as not to discourage SIEMENS from voluntarily addressing health or safety issues while at the Facility, in the event SIEMENS does address such issues by making observations, reports, suggestions or otherwise, the CLIENT shall not hold, or attempt to hold, SIEMENS liable or responsible on account thereof.

Article 7

Changes and Delays

- 7.1 As the Work is performed, Applicable Law or conditions may change, or circumstances outside SIEMENS's reasonable control may develop, which would require SIEMENS to expend additional costs, effort or time to complete the Work, in which case SIEMENS will notify the CLIENT and an equitable adjustment will be made to SIEMENS's compensation and the time for performance. In the event such changes 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 the 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 the CLIENT and the CLIENT shall promptly pay SIEMENS for the allocable portion of the Work completed, 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 The aggregate amount paid by CLIENT provides for and is solely in consideration of the Scope of Work and Services described in Exhibit A, and is detailed in Exhibit B.
- 8.2 SIEMENS will invoice the CLIENT in accordance with the schedules set forth in Exhibit B. Unless otherwise agreed in writing, invoices are due and payable within forty (40) calendar days of receipt by the CLIENT. If the 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. In such event, SIEMENS shall be entitled to compensation for the Work or Services previously performed and for costs reasonably incurred in connection with the suspension or termination.

PERFORMANCE CONTRACTING AGREEMENT

- 8.4 On amounts not paid within forty (40) days of invoice date, the 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.
- 8.5 Except to the extent expressly agreed herein, SIEMENS's fees do not include any taxes, excises, fees, duties or other government charges related to the Work or Services. The CLIENT shall pay such amounts or reimburse SIEMENS for any such amounts SIEMENS pays to the extent such charges are lawfully due and payable by CLIENT and have been paid or incurred by SIEMENS in furtherance thereof. If the CLIENT claims that the 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, unless specifically prohibited by law, shall indemnify, defend and hold SIEMENS harmless from any taxes, costs and penalties arising out of the use or acceptance of same.
- 8.6 All other work or services requested by the CLIENT, including but not limited to the following, shall be separately billed or surcharged on a time and materials basis:
- (a) Emergency services, if inspection does not reveal any deficiency covered by the Scope of Work and Services, Exhibit A;
 - (b) Work and/or services performed at times other than during SIEMENS's normal working hours, unless otherwise agreed to in Exhibit A; or
 - (c) Work and/or services performed on equipment not covered by the Scope of Work and Services, Exhibit A.

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 Completion to the CLIENT which shall be subject to the following:
- (a) If the CLIENT concurs that the described portion of the Work as performed is Substantially Complete, the CLIENT will accept that Work by signing the Certificate of Substantial Completion and returning it to SIEMENS;
 - (b) If the CLIENT does not concur that the Work is Substantially Complete, then the CLIENT shall notify SIEMENS within five (5) business days of any discrepancies;
 - (c) To the extent SIEMENS does not dispute the discrepancies raised by the CLIENT, SIEMENS shall correct the Work to conform to the description of the Work set forth herein, and resubmit the Certificate of Substantial Completion to the CLIENT;
 - (d) If SIEMENS disagrees with the discrepancies raised by the CLIENT, SIEMENS shall notify the CLIENT of a dispute and such dispute shall be resolved in accordance with Section 9.3 herein;
 - (e) If the CLIENT Representative does not deliver written notice to SIEMENS within five (5) business days of receiving the Certificate of Substantial Completion, in the mutual interests of the Project proceeding in a timely manner, the CLIENT will be deemed to have agreed to, signed and returned the Certificate of Substantial Completion.
- 9.2 To the extent that this Project requires multiple Certificates of Substantial Completion, the final Certificate of Substantial Completion shall determine the date on which the Construction Period is completed.
- 9.3 Any disputes concerning the Substantial Completion of the Work will be resolved by submitting the issue to a third party professional engineering firm and which is reasonably 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. 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, at SIEMENS's expense, the following insurances while performing the Work and shall add the CLIENT as an "Additional Insured" to each policy that is referenced in subsections (c) through and including (e) hereof:
- (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

PERFORMANCE CONTRACTING AGREEMENT

- \$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's 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 . The parties agree that CLIENT is an agency of the State of Florida, and is thereby covered by state risk management/self-insurance program(s) pursuant to Florida law and subject to the limitations and partial waiver of sovereign immunity pursuant to Section 768.28 Florida Statutes, which provides, inter alia, a limited waiver of sovereign immunity by its agencies in the amount of \$200,000 per person and \$300,000 per occurrence for tort claims, and that without admission of additional liability, excess claims may be brought to the attention of the State Legislature for consideration of payment at the discretion of the Legislature. Further, the parties agree that the CLIENT cannot name another party as an additional insured because the State of Florida's sovereign immunity is not transferrable to another party. The parties agree that the CLIENT's self-insurance coverage described hereinabove shall be deemed sufficient and acceptable in all respects whatsoever.

10.3 Title and risk of loss of materials and Equipment furnished by SIEMENS shall pass to the CLIENT upon their delivery to the Facility, and the CLIENT shall be responsible for protecting them against theft and damage.

10.4 SIEMENS will indemnify the 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's performance of the Work or Services. SIEMENS's obligations under this indemnity shall not extend to Damages arising out of or in any way attributable to the negligence of the 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. UNLESS CONTRARY TO APPLICABLE LAW, IN NO EVENT SHALL THE 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 THE CLIENT HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES AND, IN ANY EVENT, UNLESS CONTRARY TO APPLICABLE LAW, SIEMENS'S AGGREGATE LIABILITY FOR ANY AND ALL CLAIMS, LOSSES OR EXPENSES ARISING OUT OF THIS AGREEMENT, OR OUT OF ANY GOODS OR SERVICES FURNISHED UNDER THIS AGREEMENT, WHETHER BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, AGENCY, WARRANTY, TRESPASS, INDEMNITY OR ANY OTHER THEORY OF LIABILITY, SHALL BE LIMITED TO THE LESSER OF \$1,500,000 OR THE TOTAL COMPENSATION RECEIVED BY SIEMENS FROM THE CLIENT UNDER THIS AGREEMENT. The preceding limit shall not apply to the CLIENT's remedy under the Performance Guarantee as such is limited by Section 4.8.

10.5 As to Patents and Copyrights:

(a) SIEMENS will, at its own expense, defend or at its option settle any suit or proceeding brought against the CLIENT in so far as it is based on an allegation that any Work (including parts thereof), or use thereof for its intended purpose, constitutes an infringement of any United States patent or copyright, if SIEMENS is promptly provided notice and given authority, information, and assistance in a timely manner for the defense of said suit

PERFORMANCE CONTRACTING AGREEMENT

or proceeding. SIEMENS will pay the damages and costs awarded in any suit or proceeding so defended. SIEMENS will not be responsible for any settlement of such suit or proceeding made without its prior written consent. In case the Work, or any part thereof, as a result of any suit or proceeding so defended is held to constitute infringement or its use by the CLIENT is enjoined, SIEMENS will, at its option and its own expense, either: (i) procure for the CLIENT the right to continue using said Work; (ii) replace it with substantially equivalent non-infringing Work; or (iii) modify the Work so it becomes non-infringing.

- (b) SIEMENS will have no duty or obligation to the CLIENT under Section 10.5(a) to the extent that the Work is: (i) supplied according to the CLIENT's design or instructions, wherein compliance therewith has caused SIEMENS to deviate from its normal course of performance; (ii) modified by the CLIENT or its contractors after delivery; or, (iii) combined by the CLIENT or its contractors with items not furnished hereunder, and by reason of said design, instruction, modification, or combination, a suit is brought against the CLIENT. If by reason of such design, instruction, modification or combination, a suit or proceeding is brought against SIEMENS, unless expressly prohibited by law, the CLIENT shall protect SIEMENS in the same manner and to the same extent that SIEMENS has agreed to protect the CLIENT under the provisions of Section 10.5(a) above.
- (c) THIS SECTION 10.5 IS AN EXCLUSIVE STATEMENT OF ALL THE DUTIES OF THE PARTIES RELATING TO PATENTS AND COPYRIGHTS, AND DIRECT OR CONTRIBUTORY PATENT OR COPYRIGHT AND OF ALL THE REMEDIES OF THE CLIENT RELATING TO ANY CLAIMS, SUITS, OR PROCEEDINGS INVOLVING PATENTS AND COPYRIGHTS. Compliance with Section 10.5 as provided herein shall constitute fulfillment of all liabilities of the Parties under the Agreement with respect to the intellectual property indemnification.

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 Facility at which Work is performed and any soil or groundwater at the Facility 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 Applicable Law (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, the CLIENT represents and warrants that, to the best of its knowledge following due inquiry, there are no Hazardous Materials or Oil present where the Work is to be performed. SIEMENS will notify the 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 the CLIENT's representations as set forth in this Article. The discovery or reasonable suspicion of Hazardous Materials or hazardous conditions at a Facility where SIEMENS is to perform Work, or of contamination of the Facility 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 The CLIENT warrants that, prior to the execution of the Agreement, it notified SIEMENS in writing of any and all Oil or Hazardous Materials, to the best of its knowledge following due inquiry, known to be present, potentially present or likely to become present at the Facility and provided a copy of any Facility 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 Applicable Law.
- 11.3 Regardless of whether Oil or Hazardous Material was disclosed pursuant to Section 11.2, the 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 Facility 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. The CLIENT shall sign any required waste manifests in

PERFORMANCE CONTRACTING AGREEMENT

conformance with all government regulations, listing the CLIENT as the generator of the waste. If someone other than the CLIENT is the generator of the waste, the CLIENT shall arrange for such other person to sign such manifests.

11.4 INTENTIONALLY OMITTED.

11.5 For purposes of this Article 11, in the context of the phrase “to the best of its knowledge following due inquiry”; “knowledge” means actual awareness of the facts by the CLIENT’s directors, officers, employees or agents, or the presence of relevant information contained in the CLIENT’s books or records; and, “due inquiry” means inquiry of those persons under the CLIENT’s control who should have knowledge of the subject matter of such inquiry.

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 the 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 or Services. Nothing contained in this Agreement shall be construed to give any rights or benefits to anyone other than the 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, the Services, and the termination of this Agreement.

12.5 Unless contrary to Applicable Law and with the exception of disputes arising under Article 4 or Article 9, all disputes not resolved by negotiation between the Parties shall be resolved in accordance with the Commercial Rules of the American Arbitration Association in effect at that time, except as modified herein. All disputes shall be decided by a single arbitrator. A decision shall be rendered by the arbitrator no later than nine months after the demand for arbitration is filed, and the arbitrator shall state in writing the factual and legal basis for the award. No discovery shall be permitted. The arbitrator shall issue a scheduling order that shall not be modified except by the mutual agreement of the Parties. The arbitrator shall have no authority to award, and shall not award, attorneys’ fees. Judgment may be entered upon the award in the highest state or federal court having jurisdiction over the matter.

12.6 SIEMENS’s performance of the Work and Services is expressly conditioned on the Parties 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 by a Party to the other Party relating to the Work or Services, even if signed by the Parties, unless the written statement expressly indicates that such terms supersede the terms of this Agreement

12.7 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.

12.8 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.

12.9 In the event that Applicable Law or the CLIENT requires that SIEMENS procure a performance bond and/or a payment bond, SIEMENS shall provide a performance and payment bond in the amount of \$4,321,109. The performance and payment bond will solely apply to the Work performed during the Construction Period and to the required statutory lien filing period thereafter. The performance and payment bond will not apply to any of the obligations included in the Performance Assurance, Exhibit C. Furthermore, the CLIENT’s funding source may be named as “Co-Obligee” on the performance bond if so requested by the CLIENT.

Article 13

Maintenance Services Program

13.1 If applicable, the scope of Services provided by SIEMENS for the Maintenance Services Program is stated in Exhibit A.

PERFORMANCE CONTRACTING AGREEMENT

- 13.2 The CLIENT represents that all equipment not installed by SIEMENS under this Agreement and subject to a MSP is in satisfactory working condition. SIEMENS will have inspected all such equipment within the first thirty (30) days of MSP 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 the CLIENT, other than SIEMENS or a person authorized by SIEMENS, the 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 the 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 the 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'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, SIEMENS may, within ten (10) days of such inspection, give written notice that it is withdrawing such items from coverage under the MSP and adjust the MSP 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 the CLIENT. The CLIENT's failure to execute such statement within ten (10) days will void the MSP and release SIEMENS from any further obligations with respect to the MSP.
- 13.6 If the MSP scope of Services provides 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 the CLIENT.

Article 1: Scope of Work

1.0.1 *Description:* Except as otherwise expressly provided herein, SIEMENS shall provide equipment, labor, and installation/testing services necessary for implementation of this Performance Contracting Agreement between Tallahassee Community College (referred to as CLIENT) and SIEMENS.

1.0.2 *Reference Materials:* for details of items below:

Appendix 1 – Boiler Design Documents Section

Mechanical and Electrical references see “TCC WP1 100% CDs 051316.pdf”

Mechanical Specifications references see “TCC 100% Specs.pdf”

Appendix 2 – Building Automation Specifications and Cut Sheets

Appendix 3 – Lighting Retrofit Specifications and Cut Sheets

Appendix 4 – Lighting Occupancy Sensor Specifications and Cut Sheets

Appendix 5 – Water Conservation Specifications and Cut Sheets

Appendix 6 – Owner Direct Purchase of Materials Information

Appendix 7 – Main Campus Chiller Plant Upgrades

1.0.3 *Specific Elements:* Work shall include the following:

1. Heating Hot Water Plant Boilers Replacement
2. Building Automation System (BAS) Controls
3. Lighting Retrofit Upgrades
4. Lighting Occupancy Sensors
5. Water Fixture Upgrades
6. Main Campus Chiller Plant Upgrades

1.1 Heating Hot Water Plant Boilers Replacement

SIEMENS shall replace the Main Campus boilers as follows based on design documents dated 051316 in Appendix 1. Any discrepancy in written scope of work and design documents, the design documents take precedence.

Existing Boilers Demolition

1. Test existing flows at secondary pumps before disturbing existing hydronic systems to determine baseline conditions. Provide test, adjusting and balancing of new systems and systems affected by new construction activities.
2. Demolish and remove existing hot water heat exchangers.
3. Demolish and remove existing hot water piping and insulation as described in mechanical drawings.
4. The existing hot water boilers are to be decommissioned and left in place.
5. Any existing hot water boiler gas piping and electrical wiring is to be removed back to a safe location and terminated in a safe and workmanlike manner to meet applicable codes.
6. The existing primary hot water pumps are to remain operational and be left in place for future demonstration use.
7. A new primary pump high temperature safety shutdown switch will be installed per mechanical drawings.
8. New test ports will be installed in the existing primary pump piping for educational demonstration use.

New Boilers Installation

1. Replace the two existing hot water boilers with four new condensing boilers with a design capacity of 4000 MBH each.
2. Install new hot water boiler package system in new mechanical space to serve existing heating system in buildings.
3. New boiler mechanical space to be constructed by owner prior to the installation of the Siemens furnished boilers and hot water system equipment.
4. Boiler flue vent will be routed up through new owner furnished mechanical space single-story roof.
5. Re-install heating hot water distribution piping from new boiler plant to existing secondary hot water piping locations in the central energy plant.
6. Install natural gas service piping with regulator and meters to the new boilers.
7. Flush and clean new hot water piping system before connecting new boiler system to the existing hot water piping.
8. Furnish and install required building Direct Digital Controls (DDC) controls to support mechanical scope equipment operation and metering. Include startup, checkout and commissioning of supporting controls equipment. Include required Energy Management Control System (EMCS) frontend points, alarms, graphics and M&V trends.
9. Siemens will provide electric power for new controllers, new Variable Frequency Drives (VFDs) and new boilers.
10. Furnish and install four (4) new hot water primary pumps and four (4) VFDs and installation of new test ports and valves as shown in Tomahawk Engineering and Consulting, Inc. construction design drawings "TCC WP1 100% CDs 051316.pdf" found in Appendix 1.
11. Provide start, test, adjusting and balancing of new systems.
12. Siemens will provide new systems commissioning and field performance testing.

New Boilers Commissioning

Commissioning shall be performed on the following equipment and/or systems, as described below.

1. Four (4) new Patterson Kelley Boilers and boiler plant hydronic equipment.
2. Four (4) new primary hot water pumps with VFD's and (2) existing hot water secondary pumps with VFD's.
3. Gas and water flow meters will be calibrated and verified
4. Applicable Test, Balance and Adjust verification for water flows in the central plant
5. Applicable hot water plant Siemens and Patterson Kelley boiler control strategies

Routine equipment maintenance is required in order to keep the equipment operating efficiently. Such maintenance can be provided by CLIENT, SIEMENS, or a third-party so long as the servicing meets manufacturer specifications.

The new condensing boilers will require periodic maintenance as noted in the boiler manufacture O&M manuals located in Appendix 1. Boiler maintenance is not currently part of Siemens scope, though TCC may elect to negotiate this with Siemens at a future date.

Exclusions:

1. Asbestos removal, abatement or work around
2. Painting and insulation of equipment or piping outside of the scope of the proposed equipment and piping to be installed.
3. Painting or finishing of the Central Energy Plant floor.
4. Upgrading or repair of equipment or electrical services outside of the scope of the proposed equipment and piping to be installed.

Boiler Plant Controls

The Central Chiller Plant chilled water system is excluded from this scope. The new boilers will be connected to the Desigo CC server in Work Package 1 under the boiler replacement scope. The existing chiller plant will remain on the existing JCI Metasys front end and will be migrated to Desigo CC when it is addressed in Work Package 2.

Siemens proposes to furnish and install a Siemens Industry Inc. Building Automation System based on schematic construction documents issued by Tomahawk Engineering and Consulting, Inc. "TCC WP1 100% CDs 051316.pdf" found in Appendix 1.

1. Siemens Control Panel
 - a. Furnish and install (1) Siemens BACnet PXC100
 - b. Connection to Siemens Desigo server
 - c. TCC IT department are responsible for providing network infrastructure to the Siemens Desigo CC subnet.
 - d. Siemens to provide Ethernet cable to nearest TCC demark
 - e. Provide graphics, trends and alarming for boiler plant
2. Primary Heating Hot Water System
 - a. BAS Controls including sensors.
 - b. Boiler flow/safety switches are furnished, wired and installed by Siemens mechanical contractor.
 - c. Include BACnet integration for the boiler control points through BACnet MSTP master controller communication.

- d. (4) Onicon F-5200 Gas flow meter
 - e. (4) D-100-BACnet data with display
 - f. Boiler VFD and pump to be controlled by P-K Boiler controller. No direct communications between VFD and BAS is included.
 - g. Temperatures and GPM data for each boiler to be provided by Boiler manufacturer.
 - h. Onicon BACnet BTU meter, complete with;
 - i. F-1200 insertion flow meter
 - j. Paired temperature sensors
3. Secondary Heating Hot Water System
- a. Existing Pumps and VFDs shall be reused.
 - b. BAS DP switch including taps, tap valves, tubing
 - i. (1) DP switch (per pump)
 - c. (1) VFD KW meter (per VFD)
 - d. (1) In Plant DP Transmitter (taps, tap valves, tubing
 - e. (1) Onicon BACnet BTU meter, complete with;
 - i. (1) F-1200 insertion flow meter
 - ii. (2) paired temp sensors
 - f. (1) Pressure sensor
 - g. Pick up pulse on existing make up water meter
4. Air Dirt Separator (1)
- a. Furnish and install BAS control and wiring for (1) existing HW Air Dirt Separator.
 - i. (1) DP transmitter
 - ii. Existing blow down control valve to be reused
5. Miscellaneous
- a. (1) Outside Air Temperature / Relative Humidity Sensor
 - b. (1) Hydronic Bridge Temperature Sensor
 - c. Support for Boiler Plant test and balance coordination included
 - d. One (1) year parts and labor warranty included
 - e. Owner training of (24) Hours total included

1.2 Building Automation System Integration

SIEMENS shall upgrade the Tallahassee Community College (TCC) facilities described below to SIEMENS APOGEE/DESIGO automation system.

A coordinated replacement schedule to minimize downtime will be developed between SIEMENS and CLIENT.

This scope describes the Building Automation scope of work which is associated with the mechanical, electrical, BAS and control systems improvements to be performed at Tallahassee Community College (TCC). Work described herein as by Siemens is to be provided by Siemens. See Appendix 2 for building automation equipment details and cutsheets.

TCC is made up of 3 primary campuses, and divided between two control interfaces, Siemens and JCI. This scope will integrate buildings listed into the Siemens Desigo CC control interface giving TCC one front end to view and control all campuses that are currently connected to either existing system.

Main Campus Integration

1. Integrate JCI hardware onto the new Desigo CC Server. (NAEs 1, 2, 3, 5, 6, 8, 9, 11N, 11S, 12, 15, 17, 18, , 27, 30, 35, 37, 38, 39, 41, 54 & NCE 18)
 - a. Provide (1) PXC controller complete with (1) JCI Integration driver
 - i. Removal and disposal of (1) JCI NAE controller
 - ii. TCC IT department are responsible for providing network infrastructure to the Siemens Desigo CC subnet.
 - iii. Provide (1) UPS
 - b. Existing JCI field controllers, actuators, valves and wiring are assumed to be in working condition and will be reused.
 - c. Validate system operation upon completion of migration.
 - d. Existing JCI graphics to be reproduced on Siemens Desigo CC server
 - i. Additional graphics are not included

FPSI Campus Integration

1. Integrate JCI hardware onto the existing Desigo CC Server. (NAE 1, 2, 3, 4, 5 & 6)
 - a. Provide (1) PXC controller complete with (1) JCI Integration driver
 - i. Removal and disposal of (1) JCI NAE controller
 - ii. TCC IT department are responsible for providing network infrastructure to the Siemens Desigo CC subnet.
 - iii. Provide (1) UPS
 - b. Existing JCI field controllers, actuators, valves and wiring are assumed to be in working condition and will be reused. Validate system operation upon completion of migration.
 - c. Existing JCI graphics to be reproduced on Siemens Desigo CC server
 - i. Additional graphics are not included
 - d. FPSI campus to be connected to the Main Campus Siemens Desigo CC server

Integration Software

1. Desigo CC Migration
 - a. Existing and new Graphics, Schedule, Trends, programs, sequences and objects are to be updated to new campus requirements and amended for M&V as required.
 - b. Siemens Desigo CC, Advantage Navigator to be implemented
 - i. Connect all field panels to Desigo CC and APOGEE

- c. (1) Remote Notification (RENO) option to be installed

Integration Hardware

1. Front End

- a. Siemens will furnish and install (1) new Front end at TCC main campus central plant and (1) Front end at FPSI campus.
- b. (1) Desigo CC compatible server
 - i. To be mounted in TCC server room.
 - ii. 2014 SQL installed on server

Training

1. Provide (40) hours total of BAS (Controls) training to facilities personnel

BAS Controls Exclusions, Clarifications, Considerations

1. This scope does include electrical wiring and conduit required as specified.
 - a. Electrical conduit and wiring will be in conduit where required.
 - b. 120vac Power for new BAS control panels and 120vac actuation is included
 - c. Wire to be run plenum where permitted by code
 - d. NO surge protection on inputs/outputs included
2. Submittals with riser diagrams and points lists and As-built Documentation are included
3. Warranty (1) Year parts and labor as configured upon completion of install
4. Work Schedule is as follows during regular working hours M-F 8am-5pm
5. Any additional BAS hardware not described herein is NOT included
6. Any additional adjustments to the existing BAS system are NOT included
7. Repairs or upgrades to existing Siemens controllers and field devices are NOT included
8. Maintenance or software updates are NOT included
9. Furnishing or installing of Control, Smoke or Fire/Smoke Dampers not included.
10. Building fire alarm signal.
 - a. Smoke detectors and wiring is not required or included.
 - b. Connections to existing fire alarm system is not required or included.

General Building Automation Scope Information

1. Existing graphics, schedule, trends, programs, sequences and objects are to remain as existing and amended for M&V as required
2. Includes electrical wiring, conduit and labor required for a complete system for work described above
- 3.
4. Support for commissioning is included

Building Automation Warranty

1. Warranty (1) years from substantial completion

1.3 Lighting Retrofit Upgrade

See Appendix 3 – Lighting Retrofit Specifications and Cut Sheets lighting tables for a complete scope of work listing of each campus and location to be upgraded. The information provided below is a general description of the lighting work to be performed and any discrepancies between the written scope and the room-by-room inventory (Appendix 3 and 4) will have the Appendix data take precedence.

The interior lighting FIM consists mostly of the replacement of existing 28 and 32 Watt T8 fluorescent tube, metal halide, and compact fluorescent lamp lighting systems with greater energy efficiency LED lighting systems. Existing 28 and 32 Watt T8 fluorescent tube lighting systems will be retrofitted (relamp and reballast) with 4 foot 15 Watt T8 LED Linear Tube and Low Power Electronic Ballast lighting system; existing ballasts will be removed and replaced with low power electronic ballasts. Metal halide fixtures, dependent on application, will be retrofitted with a lower wattage LED lighting systems.

The parking lots lighting within each campus with HID Metal Halide Flood lamps will be replaced with new fixtures with LED lamps. The parking garages will be retrofit (relamp & reballast) from F32T8 (28 Watt) T8 fluorescent tubes with electronic ballasts to with 4' LED Linear Tube and Low Power Electronic Ballast. The HID Metal Halide lamps will be retrofit with LED luminaire and wall packs.

Exterior lighting other than the parking lots and garages on each campus will be retrofit to LED lamps as specified in the Appendix 3 tables.

New work directly associated with this facility improvement measure will be in accordance with applicable codes, specifications, and standards. However, the intent is not to correct or address existing code, specification, or standard deficiencies inherent in existing equipment, fixtures, or installations, which are considered outside the scope of this Facility Improvement Measure (FIM).

In general, the entire lighting scope of work at a minimum is to maintain the existing light levels for the given area. In areas where the light levels greatly exceed the IES foot-candle level for a defined task, the proposed retrofit recommended will meet IES standards. Siemens has identified some of the parking lot light levels currently not to meet applicable parking lot lighting level standards due to lighting pole spacing. This lighting upgrade will significantly increase the light levels in the parking lots but may not meet applicable light level standards do to existing lighting pole spacing.

The work will be performed based on student/staff occupancy levels.

Removal and environmentally safe disposal of modified existing lighting equipment will be included in the turn-key project with proper manifests and documentation provided to CLIENT upon completion.

Exclusions:

1. Lighting fixtures identified in Appendix 3 of Exhibit A as Excluded or Existing to Remain
2. Asbestos abatement or work around
3. Painting and patching
4. Replacement of missing, yellowed, or broken lenses except where designated
5. Replacement of battery backup ballasts
6. Any scope or work not expressly included in this Section

1.4 Lighting Occupancy and Photo Sensors

This Facility Improvement Measure (FIM) includes the installation of lighting sensors throughout the campus. The lighting sensors devices recommended consist of occupancy and photo sensors. Occupancy sensors replace conventional manual light switches with automatic control that powers fixtures on and off based on detection of occupancy in a controlled space. Photo sensors detect lighting levels within a controlled space and dictate powering on or off lighting fixtures under its direct control.

The installation will be performed primarily during normal working hours, with the exception of frequently occupied classrooms. Excluded from the occupancy sensor FIM scope are any rooms not included in the Appendix 4 lighting occupancy tables.

The sensors are factory-programmed with a preset time delay prior to powering off controlled lighting fixtures. The time delay can be adjusted by the installation team to ensure the sensors work properly in that particular area. This time delay can be altered in the field but it is not recommended as the longer the time delay, the less energy saved.

A detailed room by room scope of work description of all lighting retrofits, lighting counts and product information can be found in the in the Investment Grade Audit IGA and Appendix 4 of this Contract .

Exclusions:

Any scope or work not expressly included in this Section or in the detailed room by room scope of work description of all lighting retrofits, lighting counts and product information that can be found in the in the IGA and Appendix 4 of this Contract.

1.5 Water Conservation Upgrades

Water Fixture Upgrades

A description of the upgrade types is listed below followed by the proposed retrofits for each campus. The retrofit upgrades are as follows:

For water fixture cut sheet and additional details see Appendix 5.

See Table 1.5.1 below for water fixture types and counts by campus.

Table 1.5.1

Water Fixture Retrofits by Type and Campus

Campus Name	Total Fixtures	A1	F1	T1	A2	S1	P1	P2	ICE1	S2	KSP	U5	T3	A3
MAIN CAMPUS	477	193	1	2	48	17	7	47	8	34	1	119	0	0
FPSI CAMPUS	610	44	0	9	2	249	8	3	1	0	0	28	33	233
TOTALS	1087	237	1	11	50	266	15	50	9	34	1	147	33	233

Table 1.5.2

Fixture Code Upgrade Type

A1	Restroom Faucet - Installation of 0.5 GPM flow restrictor
F1	Faucet - Replace Std & Single Spigot, cold only with Delay Close (push button) Faucet
T1	Water Closet - Installation of new 1.6 GPF water closet and flush valve
A2	General Purpose Faucet - Installation of 1.5 GPM flow restrictor
S1	Showers - Replace with new low flow shower heads
P1	Sinks - Installation of Pedal Valve model S2A/S2B on Sink
P2	P2 Sinks - Installation of Pedal Valve model S2A/S2B on Sink + 1.5 GPM flow restrictor
ICE1	Installation of ChillTech heat exchanger unit on ice machine
S2	Showers - Institutional - Replace with new low flow shower heads
KSP	Installation of new low-flow 1.15 GPM kitchen sprayer
U5	Installation of .125 GPF "pint-sized" urinal and flush valve
T3	Installation of specialized 1.6 GPF wall-mount tank toilet
A3	Restroom Faucet - Installation of 1.0 GPM flow restrictor

Application of Water Fixtures and Codes:

Staff and Public Restroom Faucets (Retro Code – A1)

Siemens proposes to install (237) total of the 0.5 GPM flow restrictors on faucets currently equipped with 2.0 to 3.0 GPM flow restrictors (A1). These flow restrictors will be tamper resistant so that users cannot remove them. Special keys will be supplied to the maintenance group to be used to remove the flow restrictors for any necessary maintenance.

Exhibit A - Scope of Work and Services

Tallahassee Community College

General Purpose Sinks (Retro Code – A2)

Siemens proposes to install (50) total of the 1.5 GPM flow restrictors on faucets currently equipped with 2.0 to 3.0 GPM flow restrictors (A2). These flow restrictors will be tamper resistant. Special keys, used to remove the flow restrictors for any necessary maintenance, will be supplied to the maintenance group.

Single Spigot Cold Only Faucets (Retro Code - F1)

Siemens proposes to install (1) total of the delay close (push button) faucet fixtures (F1). Remove single spigot, cold only faucets and install delay close (push button) faucet.

Pint-sized Urinals (Retro Code – U5)

Siemens proposes to install (147) total of the .125 GPF “pint-sized” urinals fixtures (U5)

Water Closet (Retro Code – T1)

Siemens proposes to install (11) total of the 1.6 gallons per flush (GPF) water closet and flush valve (T1) in place of existing equipment that currently consumes 3.5 to 5.0 GPF.

Tank Toilet (Retro Code – T1)

Siemens proposes to install (11) total of the 1.6 gallons per flush (GPF) tank toilets (T1) in place of existing equipment that currently consumes 3.5 to 5.0 GPF.

Water Closet Specialized (Retro Code – T3)

Siemens proposes to install (33) total of the 1.6 gallons per flush (GPF) water closet and wall-mount tank toilet (T3) in place of existing equipment that currently consumes 3.5 to 5.0 GPF.

Showers (Retro Code – S1)

Siemens proposes to install (266) total of the high performance, low flow showerheads (S1). The existing 2.5 to 5.0 GPM showerheads will be replaced with 1.5 GPM heads.

Showers (Retro Code – S2)

Siemens proposes to install (34) total of the high performance, low flow showerheads (S2). The existing 2.5 to 5.0 GPM showerheads will be replaced with 1.5 GPM heads.

Dishwasher Line Pre-rinse Sprayer (Retro Code – KSP)

Siemens proposes to install (1) total of the new 1.15 GPM Spray Head Nozzle (KSP) on the dishwasher line pre-rinse spray faucet.

Ice Machines (Retro Code – ICE1)

Siemens proposes to install (9) total of the ChillTech heat exchanger (ICE1) on 9 ice machines.

Hand Wash / Medical Style Service Sinks (Retro Code – P2)

Siemens proposes to install (50) total of the Pedal Valve controls (P2) on Sinks. The medical service sinks will be retrofitted with hands free foot pedal faucet controllers and a 1.5 GPM flow restrictor.

Food Service Sinks (Retro Code – P1)

Siemens proposes to install (15) total of the Pedal Valve controls (P1) on Sinks. The food service sinks will be retrofitted with hands free foot pedal faucet controllers.

Disposition of Removed Equipment:

Exhibit A - Scope of Work and Services

[Tallahassee Community College](#)

Removed existing equipment will be disposed of properly or recycled. Due to the probability and nature of contamination of the removed equipment, future use of the materials is not recommended and the material will not be made available for surplus.

Exclusions:

1. Labor to repair previously deteriorated plumbing not associated with the work defined in this scope.
2. SIEMENS will not repair or replace corroded wall hung toilet drain pipes.
3. Any enhancements to fixtures that are not covered in existing plumbing code.
4. SIEMENS is not responsible for previous damage to wall or flooring not associated with the scope of work.
5. SIEMENS shall reserve the right to refuse replacement of a non-functioning angle stop based on the current condition of the plumbing.
6. Any scope or work not expressly included in this section.

Water Fixture Warranty

Water fixture warranty is in effect for a one (1) year period from the date of installation.

The general terms for warranty are as follows:

1. It will be necessary for Tallahassee Community College to inspect the suspected warranty issue and provide details that clarify the problem as being due to faulty workmanship before warranty labor can be dispatched. Warranty work will be performed during regular working hours, and is subject to availability of service providers.
2. Material warranty shall be covered by manufacturer's warranty. Tallahassee Community College is responsible for contacting the manufacturer directly for repair or replacement, and associated labor. Manufacturer contact information will be provided in a separate document.
3. Owner is responsible for preventive maintenance and other general maintenance tasks.
4. Siemens is not responsible for warranty coverage on any equipment repaired by others, abused, altered, misused, damaged by fire, flood, or Act of God, or which has not been reasonably and properly maintained.

1.6 Main Campus Chilled Water Plant Upgrades

SIEMENS shall upgrade the Main Campus chiller energy plant (CEP) as follows based on design documents in Appendix 7. Any discrepancy in written scope of work and design documents, the design documents take precedence.

Scope Summary

1. Remove and replace Chiller1 with new 500 ton chiller
2. Remove and replace Chiller1 primary pump and motor with new primary pump and motor
3. Upgrade CEP ventilation to meet ASHRAE 15 guidelines
4. Remove and replace Cooling Tower 2 with new 1000 ton cooling tower
5. Remove and replace Cooling Tower 3 fill with new fill
6. Add Variable Frequency Drives to primary chilled water pumps
7. Add Variable Frequency Drives to condenser chilled water pumps
8. Add Variable Frequency Drives to new Cooling Tower 2 fans
9. Remove and replace Variable Frequency Drives on ten (10) tertiary pumps
10. Add new tertiary pumps with Variable Frequency Drives in three (3) campus buildings
11. Upgrade CEP controls with Siemens Controls
12. Apply Siemens Demand Flow controls sequences and hardware to CEP

Replace Chiller 1

1. Test existing flows at chilled water secondary pumps before disturbing existing hydronic systems to determine baseline conditions. Provide test, adjusting and balancing of chiller plant systems to be affected by chiller plant modifications.
2. The existing Chiller 1 is to be properly decommissioned and removed.
3. Install the new Chiller 1 and reconnect electrical and hydronic piping and refrigerant vent lines
4. Flush and clean new chiller and localized Chiller 1 water piping systems before connecting new chiller to the existing CEP water piping.
5. Furnish and install required building Direct Digital Controls (DDC) controls to support mechanical scope equipment operation and metering. Include startup, checkout and commissioning of supporting controls equipment. Include required Energy Management Control System (EMCS) frontend points, alarms, graphics and M&V trends.
6. Provide start, test, adjusting and balancing of new chiller and related systems.
7. Siemens will provide new systems commissioning and field performance testing.

Routine equipment maintenance is required in order to keep the equipment operating efficiently. Such maintenance can be provided by CLIENT, SIEMENS, or a third-party so long as the servicing meets manufacturer specifications.

The new chiller will require periodic maintenance as noted in the chiller manufacture O&M manuals located in Appendix 7. Chiller maintenance is not currently part of Siemens scope, though TCC may elect to negotiate this with Siemens at a future date.

Replace Chiller 1 Primary Chilled Water Pump

1. Test existing flows and electrical current draw at Chiller 1 chilled water primary pump before disturbing existing hydronic systems to determine baseline conditions.
2. Remove existing Chiller 1 chilled water primary pump and motor.
3. Install new Chiller 1 chilled water primary pump and motor.
4. Reconnect electrical service.
5. Test flows and electrical current draw at new Chiller 1 chilled water primary pump.

Upgrade CEP Ventilation to ASHRAE 15 guidelines

1. Remove existing CEP ventilation systems and install new CEP ventilation system to meet ASHRAE 15 guidelines.

Replace Cooling Tower 2

1. Remove Cooling Tower 2 and dispose of properly to meet any applicable codes and standards.
2. Remove cooling tower condenser water piping connections and valves.
3. Remove cooling tower electrical service back to location reasonable to reconnect to new cooling tower.
4. Install new cooling tower structural supports.
5. Install new cooling tower.
6. Install new electrical service, piping, valves and controls sensors.
7. Flush and clean new cooling tower and localized water piping systems before connecting new cooling tower to the existing CEP condenser water piping.
8. Provide start, test, adjusting and balancing of new cooling tower and related systems.
9. Siemens will provide new systems commissioning and field performance testing.

Replace Cooling Tower 3 Fill

1. Remove Cooling Tower 3 fill and dispose of properly to meet any applicable codes and standards.
2. Install new cooling tower fill.
3. Flush and clean new cooling tower and localized water piping systems before connecting new cooling tower to the existing CEP condenser water piping.
4. Provide start, test, adjusting and balancing of new cooling tower and related systems.
5. Siemens will provide new systems commissioning and field performance testing.

Add Variable Frequency Drives to CEP Primary Chilled Water Pumps

1. Remove existing motor starter and dispose of properly to meet any applicable codes and standards.
2. Install new variable frequency drive per mechanical and electrical design on chilled water pumps for chillers 1 and 5.
3. Provide start, test and adjusting of new variable frequency drive and related systems.
4. Siemens will provide new systems commissioning and field performance testing.

Add Variable Frequency Drives to CEP Condenser Water Pumps

1. Remove existing motor starter and dispose of properly to meet any applicable codes and standards.
2. Install new variable frequency drive per mechanical and electrical design on condenser water pumps for chillers 1, 4 and 5.
3. Provide start, test and adjusting of new variable frequency drive and related systems.
4. Siemens will provide new systems commissioning and field performance testing.

Add Variable Frequency Drives to Cooling Tower 2 Fans

1. Remove existing motor starters and dispose of properly to meet any applicable codes and standards.
2. Install new variable frequency drives per mechanical and electrical design on Cooling Tower 2 fans.
3. Provide start, test and adjusting of new variable frequency drive and related systems.
4. Siemens will provide new systems commissioning and field performance testing.

Replace Variable Frequency Drives on Ten (10) Tertiary Pumps

1. Remove existing variable frequency drives and dispose of properly to meet any applicable codes and standards.
2. Install new variable frequency drives per mechanical and electrical design on each tertiary pump located in Buildings 1, 5, 9, 11, 12, 18, 30, 38, 39 and 41.
3. Provide start, test and adjusting of new variable frequency drive and related systems.
4. Siemens will provide new systems commissioning and field performance testing.

Add New Tertiary Pumps with Variable Frequency Drives in Three (3) Campus Buildings

1. Install new tertiary pumps with variable frequency drives per mechanical and electrical design in Buildings 15, 27, 35.
2. Include mechanical equipment, piping, fittings, strainers, valves and gauges.
3. Include new electrical service to new pumps location.
4. Provide start, test and adjusting of new pumps, variable frequency drives and related systems.
5. Siemens will provide new systems commissioning and field performance testing.

Upgrade CEP controls with Siemens Controls

1. Install new Siemens Industry Inc. Building Automation System in the Main Campus CEP and tertiary pumping systems.
2. Chiller Plant - Siemens Control Panel
 - a. Furnish and install (1) Siemens BACnet PXC100
 - i. Connection to Siemens Desigo server
 - ii. TCC IT department are responsible for providing network infrastructure to the Siemens Desigo CC subnet.
 - iii. Siemens to provide Ethernet cable to nearest TCC demark
 - iv. Graphics, trends and alarming for chiller plant
3. Primary Chilled Water System
 - a. Chiller-1 System
 - i. Include BACnet integration for the chillers with clarifications below.
 - ii. Control points are through BACnet MSTP controller communication where available on chiller.
 - iii. Provide (3) Temp sensors and (3) new wells.
 - iv. Integration to (1) existing chilled water pump VFD
 - v. Provision and certified startup of (2) Siemens BT-300 VFD
 - vi. Provide and install (1) Digital Electric Meter
 - vii. Provide and install (2) DP transmitters on chiller
 - viii. Provide (2) Chiller Flow Safety Switches (IFM)
 - ix. Provide Taps, Tap Vales & Tubing for controls sensors
 - x. Provide (8) P/T Ports
 - b. Chiller 4 System
 - i. Include BACnet integration for the chillers with clarifications below.
 - ii. Control points are through BACnet MSTP controller communication where available on chiller.
 - iii. Provide (3) Temp sensors and (3) new wells.
 - iv. Integration to (1) existing chilled water pump VFD
 - v. Provision and certified startup of (1) Siemens BT-300 VFD
 - vi. Provide and install (1) Digital Electric Meter
 - vii. Provide and install (2) DP transmitters on chiller
 - viii. Provide Taps, Tap Vales & Tubing for controls sensors
 - ix. Provide (8) P/T Ports

- c. Chiller 5 System
 - i. Include BACnet integration for the chillers with clarifications below.
 - ii. Control points are through BACnet MSTP controller communication where available on chiller.
 - iii. Provide (3) Temp sensors and (3) new wells.
 - iv. Integration to (1) existing chilled water pump VFD
 - v. Provision and certified startup of (2) Siemens BT-300 VFD
 - vi. Provide and install (1) Digital Electric Meter
 - vii. Provide and install (2) DP transmitters on chiller
 - viii. Provide Taps, Tap Vales & Tubing for controls sensors
 - ix. Provide (8) P/T Ports
- d. Cooling Tower – 3 (Existing)
 - i. Provide (2) Temperature sensors and (2) new wells
 - ii. Integration to (2) existing VFDs
 - iii. Provide (2) P/T Ports
 - iv. Existing valves/actuators to be reused
- e. Cooling Tower – 2 (New)
 - i. Provide (2) Temp sensors and (2) new wells
 - ii. Provide (2) P/T Ports
 - iii. Provision and certified startup of (2) Siemens BT-300 VFDs
 - iv. Provide (4) 2 way butterfly valves and actuators
 - v. Provide (2) 3 way butterfly valve and actuator
- f. Misc Sensors
 - i. Provide (2) Temp sensors for primary supply and return and (2) new wells
 - ii. Provide (2) P/T Ports
- 4. Secondary Chilled Water System
 - a. Pumps and VFDs are existing and shall be reused.
 - i. Integration to existing (3) secondary chilled water pump VFDs is included
 - b. Provide (1) Onicon BACnet BTU meter, complete with (1) F-3500 insertion flow meter and (2) paired temp sensors
 - c. Provide (1) DP transmitter
 - d. Provide (4) P/T Ports
 - e. Connection to existing Air Dirt Separator
 - i. Reuse existing Air Dirt Separator controller where applicable
- 5. Existing Tertiary Chilled Water System (typical of Blgs 1, 5, 9, 11, 12, 18, 30, 38, 39, 41)
 - a. Furnish and install (1) Siemens BACnet PXC100
 - i. Connection to Siemens Desigo server
 - ii. TCC IT department are responsible for providing network infrastructure to the Siemens Desigo CC subnet.
 - iii. Siemens to provide Ethernet cable to nearest TCC demark
 - b. Provide (2) Temperature sensors
 - i. Sensors will utilize existing wells where possible
 - ii. New wells to be installed as needed.
 - c. Provision and certified startup of (1) Siemens BT-300 VFD per tertiary pump
 - d. Integration to existing VFD where possible will be utilized in place of new drive.
 - e. Provide (1) DP transmitter including Taps, Tap Vales & Tubing
 - f. Provide (4) P/T Ports
 - g. Where existing Onicon flow meters are installed (Blgs 5, 30, 38, 39 & 41) meters will be recalibrated and reused.
- 6. New Tertiary Pumps (typical of Blgs 15, 27, 35)
 - a. Furnish and install (1) Siemens BACnet PXC100

- i. Connection to Siemens Desigo server
 - ii. TCC IT department are responsible for providing network infrastructure to the Siemens Desigo CC subnet.
 - iii. Siemens to provide Ethernet cable to nearest TCC demark
 - b. Provide (2) Temperature sensors and New wells
 - c. Provision and certified startup of (1) Siemens BT-300 VFD per tertiary pump
 - d. Provide and Install (1) DP transmitter and Taps, Tap Vales & Tubing
 - e. Provide and Install (4) P/T Ports
7. Controls Systems Inclusions, Exclusions and Clarifications:
 - a. Include electrical wiring and conduit required as specified.
 - i. Electrical conduit and wiring as specified.(all wiring will be in conduit)
 - ii. Include all fire/smoke rated penetrations for BAS wiring and conduit.
 - iii. Include 120vac Power for BAS control panels and 120vac actuation
 - b. Include Submittals and As-built Documentation
 - c. Include T&B Assistance as specified
 - d. Include One (1) year parts and labor warranty as specified.
 - e. Include Owner training (24) Hours total.
 - f. Maintenance or software updates are NOT included
 - g. Any additional adjustments to the system are NOT included
 - h. Furnishing or Installing of Control, Smoke or Fire/Smoke Dampers are NOT included
 - i. Building fire alarm signal control is NOT included
 - j. Smoke detectors and wiring is NOT included
 - k. Connections to fire alarm system is NOT included

Apply Siemens Demand Flow Controls Sequences to the CEP

SIEMENS will provide the following engineering services to support the Demand Flow installation:

1. Provide and implement Demand Flow scope and sequences of operation and provide Demand Flow system improvement recommendations to the CLIENT.
2. Provide Demand Flow chiller plant optimization implementation support including site visits, review of installation, coordination with SIEMENS Demand Flow Center of Excellence and Demand Flow commissioning support.

Exclusions:

1. Asbestos removal, abatement or work around
2. Painting and insulation of equipment or piping outside of the scope of the proposed equipment and piping to be installed.
3. Painting or finishing of the Central Energy Plant floor.
4. Upgrading or repair of equipment or electrical services outside of the scope of the proposed equipment and piping to be installed.

Article 2: Work Implementation Period

1. Commencement of Work

SIEMENS shall commence the Work 30 calendar days from the Effective Contract Date, and shall perform Work diligently and shall complete the Work no later than 478 days (18 months) from the day of commencement.

2. Substantial Completion

As components reach Substantial Completion, SIEMENS shall present a Certificate of Substantial Completion (Exhibit D-1) for CLIENT'S execution to confirm Substantial Completion has been reached for that component.

3. Commissioning Period

Immediately following installation of FIMs, a commissioning period will commence on installation of devices and specifically on the programming of devices and sequence of operations.

4. Final Completion

Upon final completion SIEMENS shall submit a Certificate of Final Completion (Exhibit D-2) to CLIENT for signature. The first 30 days following the commencement of work will be dedicated for CLIENT to work with SIEMENS to finalize actual sequencing plan and thereafter to revise plan as needed to minimize extended construction term and respond to user needs within the facilities.

5. Owner Direct Purchase

The first 30 days following the commencement of work Client shall issue procurement order of owner direct purchase (ODP) equipment (currently identified as Hot Water Boilers, Pumps, Boiler Stacks, Water Fixtures, Lighting material, Chiller and Cooling Tower) as prompt ordering of equipment is critical due to long manufacturing lead times. The ODP material list is defined in Appendix 6 with the associated total cost.

Article 3: Scope of Services - Performance Assurance Services Program

1. As defined in Exhibit C, this project will be pre/post measurements of the Main Campus boiler efficiencies, multiple campus water savings parameters of water saver devices and water saver fixtures and lighting efficiencies during the construction period and stipulated thereafter. This is one time pre/post measurements as indicated in IPMVP Option A. The Main Campus Chiller Plant upgrades will utilize IPMVP Option B as defined in Exhibit C. The CLIENT recognizes that changes may be made over time to spaces due to changing needs and CLIENT will be responsible to document changes and savings impacts.
2. Controls savings were applied in the Work Package and as such there will be measurement and verification efforts required on the installed controls equipment.
3. The water savings will be measured and verified by taking actual pre and post installation measurements of a sample set of each installed water device and fixture type.
4. The lighting savings will be measured and verified by taking actual pre and post installation measurements of a sample set of each installed lighting fixture type.
5. The savings report will include the pre and post measurements of the boiler efficiency key parameters, water savings parameters of installed water saver devices and fixtures and installed lighting efficiency parameter values which will conclude measurement related M&V activities to document the savings. Once these savings have been documented they shall be stipulated for annual reporting for the term of the agreement.
6. The savings report will also include the pre and post measurements of the chiller plant efficiency key parameters values which will be included in measurement related M&V activities to document the savings. Once these savings have been documented for a period of one year they shall be stipulated for annual reporting for the term of the agreement.
7. SIEMENS will perform an annual report generation and presentation as a part of the Performance Assurance Services Program (PATSP).
8. Bi-Annual site visits will be performed for rotating measurement and observation of installed systems, periodic noting of energy system anomalies, opportunities, and best practices, and periodic staff coaching and training.

9. Utility budget tracking will be performed on the specified gas, electric and water utilities and included within quarterly and annual measurement and verification reports.
 - A. Main Campus Electric Meter - ELECTRIC E75005
 - B. Baseball Field Lighting Electric Meter - ELECTRIC E402231
 - C. Main Campus Gas Meter (Boilers) - Gas G10010
 - D. Main Campus Water Meters - W202177
 - E. FPSI Dorm Water Meters - 16063918691; 7481703

10. Quarterly measurement and verification reports will be submitted with the following to the CLIENT:
 - A. Guaranteed savings updates.
 - B. Utility budget charts of monthly energy cost and consumption
 - C. Energy usage index by specified meter and facility area.
 - D. Bi-Annual site visit reports.

Article 4: Scope of Services - Maintenance Services Program

No annual Maintenance Services Programs are included with this project. Other than the Services listed above in the construction scope of work CLIENT has full responsibility for the maintenance of the equipment. The Parties may negotiate a separate agreement for additional services at a later date. CLIENT agrees they will maintain equipment per manufacturer specifications and will operate Equipment in accordance with Contracted Baseline Conditions described in Article 7 of Exhibit C. If CLIENT fails to properly maintain or operate Equipment, SIEMENS shall have the right to modify this Performance Guarantee pursuant to Article 4 of this Agreement.

By signing below, this Exhibit is attached to and made a part of this Agreement between SIEMENS and CLIENT.

CLIENT: **Tallahassee Community
College Board of
Trustees, acting for and
on behalf of Tallahassee
Community College**

Signature: _____
Printed Name: _____
 Title: _____
 Date: _____

SIEMENS: **Siemens Industry, Inc.**

Signature: _____
Printed Name: _____
 Title: _____
 Date: _____

Signature: _____
Printed Name: _____
 Title: _____
 Date: _____

Article 1: Payment for Scope of Work

- 1.1 **Price:** As full consideration of the Work as described in Exhibit A, Article 1: Scope of Work, the CLIENT shall pay to SIEMENS **\$6,658,360** (plus taxes, if applicable). Table B.1 reflects SIEMENS Price, as well the Total Project Price of \$8,059,976 which includes \$1,401,616 of ODP equipment which CLIENT will obtain direct from vendors pursuant to F.S. 212.08(6).
- 1.2 **Escrow:** The CLIENT has agreed to deposit the Price into an Escrow Account at a financial institution satisfactory to both the CLIENT and SIEMENS. All 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 Payment Schedule in Table B.1 below. The CLIENT shall be responsible for submitting the necessary documents to the Escrow Agent to allow for timely disbursements 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 of the execution of this Agreement, this Agreement shall be null and void. This 30 day funding period may be extended as mutually agreed in writing by the Parties. In the event that the Agreement becomes null and void as described in this paragraph and CLIENT has previously authorized SIEMENS to proceed with the Work, the CLIENT shall be obligated to reimburse SIEMENS either: (i) for the Work performed to date; or (ii) for the Work specifically authorized by the CLIENT.
- 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 Article 8 of the Agreement.

Table B.1 – FIM Work Payment Schedule to Siemens

Project Phase	Payments (\$)	Payments (%)	Schedule
Project Development, Performance Bond, Design Engineering & Measurement & Verification & Mobilization	665,836	10	Upon Execution of Performance Contracting Agreement
Progress Billing for Scope During Construction Phase	5,659,606	85	Monthly Progress Invoices
Final Payment	332,918	5	Upon Completion
SIEMENS' PRICE:	6,658,360	100	
Direct Purchase Equipment (Lighting Materials, Water Conservation Materials, Boilers, Pumps & Drives)	1,401,616		
PROJECT TOTAL:	8,059,976		

Article 1 of Exhibit B is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT: **Tallahassee Community
College Board of Trustees,
acting for and on behalf of
Tallahassee Community
College**

Signature: _____
Printed Name: _____
Title: _____
Date: _____

SIEMENS: **Siemens Industry, Inc.**

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Article 2: Payment for Performance Assurance Services Program (PASP)

- 2.1 **Price:** As full consideration of the Services as described in Exhibit A, Article 3, the CLIENT shall pay to SIEMENS the amounts identified in Table B.2 plus taxes, if applicable, on the dates identified therein.
- 2.2 **Performance Assurance Services Program Term:** The term of the PASP shall commence on the Guarantee Date and shall extend for either: (a) the term of the Performance Guarantee Period where multi-year obligations are allowed; or (b) for twelve (12) month periods corresponding to the term of each Annual Period.
- 2.3 **Automatic Renewal:** Where the PASP term is limited to an Annual Period, the PASP shall automatically renew for successive Annual Periods beginning on the anniversary date of Guarantee Date. Either party may request to amend the PASP scope at the end of an Annual Period by giving the other party at least sixty (60) days prior written notice of such amendments and such amendment shall be mutually negotiated by the Parties and effective upon a written amendment signed by both Parties prior to commencement of the next Annual Period. Each automatic renewal shall be and remain subject to the terms and conditions of this Agreement. SIEMENS obligations under the Performance Guarantee are dependent upon and subject to the express condition that the CLIENT maintains the PASP during the entire Performance Guarantee Period.
- 2.4 **Termination:** See Section 4.7 of the Agreement.

Table B.2 – Performance Assurance Program Payment Schedule

Annual Period	Annual Cost PASP Services
1	\$38,549
2	\$35,486
3	\$36,551
4	\$37,647
5	\$38,777
6	\$39,940
7	\$41,138
8	\$42,372
9	\$43,643
10	\$44,953
11	\$46,301
12	\$47,690
13	\$49,121
14	\$50,595
15	\$52,112

* Quarterly payments billed in arrears commencing the 1st of the month following execution of the project Certificate of Final Completion

Article 2 of Exhibit B is attached to and made a part of the Agreement between SIEMENS and the CLIENT.

CLIENT: **Tallahassee Community
College Board of Trustees,
acting for and on behalf of
Tallahassee Community
College**

Signature: _____
Printed Name: _____
Title: _____
Date: _____

SIEMENS: **Siemens Industry, Inc.**

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Signature: _____
Printed Name: _____
Title: _____
Date: _____

The following Articles and Tables are hereby included and made part of this Exhibit C:

Article 1: Summary of Articles and Total Guaranteed Savings

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

Reference Materials: for details of items below:

- Appendix 1 – Boiler Design Documents Section
 - Mechanical and Electrical references see “TCC WP1 100% CDs 051316.pdf”
 - Mechanical Specifications references see “TCC 100% Specs.pdf”
- Appendix 2 – Building Automation Specifications and Cut Sheets
- Appendix 3 – Lighting Retrofit Specifications and Cut Sheets
- Appendix 4 – Lighting Occupancy Sensor Specifications and Cut Sheets
- Appendix 5 – Water Conservation Specifications and Cut Sheets
- Appendix 6 – Owner Direct Purchase of Materials Information
- Appendix 7 – Main Campus Chiller Plant Upgrades

Table 1.1 – Total Guaranteed Savings (Units)

Performance Period	Electric Energy (kWh)	Electric Demand (kW)	Natural Gas (Therms)	Water (kGal)
Annual Period 1	4,278,390	10,380	34,178	3,943

- 1.1 Only Annual Period 1 is shown in the table above. The energy/utility unit savings will remain constant for each Annual Period of the Performance Guarantee Period. It is assumed the CLIENT will operate the Facility in accordance with the Contracted Baseline Conditions identified in Article 7.

Table 1.2 – Total Guaranteed Annual Savings in Dollars

Performance Period	Energy/Utility Savings	Operational Savings	Total Savings
Construction Period	\$ 225,249	\$ -	\$ 225,249
Annual Period 1	\$ 450,379	\$ 40,173	\$ 490,552
Annual Period 2	\$ 463,890	\$ 41,378	\$ 505,269
Annual Period 3	\$ 477,807	\$ 42,620	\$ 520,427
Annual Period 4	\$ 492,141	\$ 43,898	\$ 536,039
Annual Period 5	\$ 506,906	\$ 45,215	\$ 552,121
Annual Period 6	\$ 522,113	\$ 46,572	\$ 568,684
Annual Period 7	\$ 537,776	\$ 47,969	\$ 585,745
Annual Period 8	\$ 553,909	\$ 49,408	\$ 603,317
Annual Period 9	\$ 570,527	\$ 50,890	\$ 621,417
Annual Period 10	\$ 587,642	\$ 52,417	\$ 640,059
Annual Period 11	\$ 605,272	\$ 53,989	\$ 659,261
Annual Period 12	\$ 623,430	\$ 55,609	\$ 679,039
Annual Period 13	\$ 642,133	\$ 57,277	\$ 699,410
Annual Period 14	\$ 661,397	\$ 58,995	\$ 720,392
Annual Period 15	\$ 681,239	\$ 60,765	\$ 742,004
Totals	\$ 8,601,809	\$ 747,174	\$ 9,348,983

- 1.2 Table 1.2 shows the CLIENT’S guaranteed Savings in dollars for each Annual Period that are extrapolated from the guaranteed energy/utility unit Savings shown in Table 1.1 by multiplying the energy/utility Savings by the Baseline energy/utility rates including the stipulated Escalation Rates found in Article 6.
- 1.3 SIEMENS cannot and does not predict fluctuations in utility rates or the cost of energy. Therefore, the CLIENT and SIEMENS agree that the energy/utility cost Savings for each Annual Period will be calculated by multiplying the verified units of energy/utility Savings by the Annual Period’s stipulated energy/utility rate and Escalation Rates and not the Annual Period’s actual utility rate.
- 1.4 The determination of energy/utility Savings will follow current best practice, as defined in the IPMVP, or the FEMP Guidelines where required, unless otherwise agreed to by the Parties.
- 1.5 The Performance Guarantee does not operate to guarantee the Savings per Facilities Improvement Measure (FIM). Rather, the calculation of Savings is based on aggregate

performance of all of the FIMs contained in the Project. The projected value of such aggregate performance is contained in Table 1.2 above representing the Total Guaranteed Savings as monetized.

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

CLIENT: Tallahassee Community
College Board of Trustees,
acting for and on behalf of
Tallahassee Community
College

Signature: _____
Printed Name: _____
Title: _____
Date: _____

SIEMENS: Siemens Industry, Inc.

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Article 2: Measurement and Verification Options

2.1 Measurement and Verification Options: There are five measurement and verification options to measure and verify energy/utility Savings: Option A - Retrofit Isolation: Key Parameter Measurement; Option B - Retrofit Isolation: All Parameter Measurement; Option C - Whole Facility; and, Option D – Calibrated Simulation. Options A through and including D are part of the IPMVP. Option E-Stipulated is based on industry accepted engineering standards and is the Option used for purposes of calculating Operational Savings.

Option A - Retrofit Isolation: Key Parameter Measurement. Savings are determined by field measurement of the key performance parameter(s) which define the energy use of the Facilities Improvement Measure's (FIM) affected system(s) and/or the success of the Project. Measurement frequency ranges from short-term to continuous, depending on the expected variations in the measured parameter and the length of the reporting period. Parameters not selected for field measurement are estimated. Estimates can be based on historical data, manufacturer's specifications, or engineering judgment. Documentation of the source or justification of the estimated parameter is required. The plausible savings error arising from estimation rather than measurement is evaluated. If applicable, the predetermined schedule for data collection, evaluation, and reporting is defined in Exhibit A, Article 3-Performance Assurance Services Program.

Option B – Retrofit Isolation: All Parameter Measurement. Savings are determined by field measurement of the energy use of the FIM-affected system. Measurement frequency ranges from short-term to continuous, depending on the expected variations in the savings and the length of the reporting period. If applicable, the predetermined schedule for data collection, evaluation, and reporting is defined in Exhibit A, Article 3-Performance Assurance Services Program.

Option C - Whole Facility: Savings are determined by measuring energy use at the whole Facility or sub-Facility level. Continuous measurements of the entire Facility's energy use are taken throughout the reporting period. If applicable, the predetermined schedule for data collection, evaluation, and reporting is defined in Exhibit A, Article 3-Performance Assurance Services Program.

Option D - Calibrated Simulation: Savings are determined through simulation of the energy use of the whole Facility, or of a sub-Facility. Simulation routines are demonstrated to adequately model actual energy performance measured in the Facility. This Option usually requires considerable skill in calibrated simulation. If applicable, the predetermined schedule for data collection, evaluation, and reporting is defined in Exhibit A, Article 3-Performance Assurance Services Program.

Option E – Stipulated: This Option is the method of measurement and verification applicable to FIMS consisting either of Operational Savings or 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 FIM and no further measurements or calculations will be performed during the Performance

Guarantee Period. If applicable, the methodology and calculations to establish Savings value will be defined in Section 4 of this Exhibit C.

2.2 Table 2.1 below summarizes the first Annual Period’s Guaranteed Savings (See Article 1, Tables 1.1 and 1.2) utilizing the applicable Measurement and Verification Options as applied to the referenced FIMs valued pursuant to the agreed upon amounts identified in Article 6 hereof.

Table 2.1 – Guaranteed Savings Dollars for First Annual Period by Option

FIM Name or Type	Energy / Utility Savings \$						Operational Savings \$*	Total Savings \$
	Measurement and Verification Options							
	A Retrofit Isolation: Key Parameter Measurement	B Retrofit Isolation: All Parameter Measurement	C Whole Facility	D Calibrated Simulation	E Stipulated	Total Energy/Utility Savings	E Stipulated	
HVAC - Boilers	\$34,754	\$0	\$0	\$0	\$0	\$34,754	\$0	\$34,754
Lighting Upgrades	\$258,859	\$0	\$0	\$0	\$0	\$258,859	\$40,173	\$299,032
Water Fixtures	\$50,649	\$0	\$0	\$0	\$0	\$50,649	\$0	\$50,649
HVAC - CEP	\$0	\$106,116	\$0	\$0	\$0	\$106,116	\$0	\$106,116
Totals:	\$344,262	\$106,116	\$0	\$0	\$0	\$450,378	\$40,173	\$490,551

* See Table 2.2 below for breakout of Operational Savings.

2.3 Table 2.2 below identifies the source of Operational Savings defined and quantified by the Parties. The Parties affirm that such amounts are Stipulated Savings for purposes of calculating Annual Realized Savings and acknowledge that the Guaranteed Savings identified herein have been based on CLIENT’S affirmation. **OPERATIONAL SAVINGS SHALL NOT BE MEASURED OR MONITORED DURING THE PERFORMANCE GUARANTEE PERIOD.**

Table 2.2 - Source of Operational Savings

Account/Vendor	Description	Annual Cost \$	Number of Annual Periods Savings Are Applied	Annual Period Savings Begin
Client Avoided Cost	Future years lighting equipment replacement (Main Campus, FPSI, Ghazvini)	\$40,173	15	1

2.4 SIEMENS has explained to the CLIENT and the CLIENT has satisfied itself as to how Operational Savings are incorporated into the Annual Realized Savings.

2.5 The Escalation Factor applicable to the Operational Savings is 3%.

BY SIGNING BELOW, THE PARTIES CONFIRM THAT THEY HAVE REVIEWED THE INCLUDED MEASUREMENT AND VERIFICATION OPTIONS AND THEIR APPLICATION TO BE USED IN CALCULATING SAVINGS UNDER THE AGREEMENT.

CLIENT: **Tallahassee Community
College Board of Trustees,
acting for and on behalf of
Tallahassee Community
College**

Signature: _____
Printed Name: _____
Title: _____
Date: _____

SIEMENS: **Siemens Industry, Inc.**

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Signature: _____
Printed Name: _____
Title: _____
Date: _____

Article 3: Performance Guarantee Period Responsibilities of the CLIENT

In addition to the CLIENT'S responsibilities under Article 4 of the Agreement, this Article details the responsibilities of the CLIENT in connection with the management and administration of the Performance Guarantee.

- 3.1 The CLIENT will provide a representative at each 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, within thirty (30) days of any Material Change that may increase or decrease energy usage.
 - (a) Facility occupancy data and usage.
 - (b) Changes in operating schedules on any of the facilities.
 - (c) Major additions or deletions of equipment.
 - (d) Annually provide monthly number of water meter accounts
 - (e) Annually provide monthly database records of billing information including but not limited to metering dates, billing date, billed water, billed cost, meter size, meter number and address within local, state and federal privacy limitations. This information shall only be used for the sole purposes of this Agreement.
 - (f) Annually provide copies of all water and sewer rate schedules used for billing during the previous 12 month period if changed from the previous year.
 - (g) Annually provide monthly purchased, pumped, and/or distributed water volumes from the water plant records
- 3.3 CLIENT will provide SIEMENS with copies of utility bills within thirty (30) days of receipt by CLIENT or provide access to utility vendor information.
 - (a) Monthly electric bills
 - (b) Monthly natural gas bills
 - (c) Monthly water bills
- 3.4 Reporting information will require monthly utility bills for the meters below:
 - (a) Main Campus Electric Meter - ELECTRIC E75005
 - (b) Baseball Field Lighting Electric Meter - ELECTRIC E402231
 - (c) Main Campus Gas Meter (Boilers) - Gas G10010
 - (d) Main Campus Water Meters - W202177
 - (e) FPSI Dorm Water Meters - 16063918691; 7481703
- 3.5 If required for the Work, CLIENT will provide telephone/data remote access, through SIEMENS Insight® 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.
- 3.6 If required for the Work, CLIENT will provide and coordinate utility meter upgrade for interface with SIEMENS metering and data collection. All charges related for these upgrades are the responsibility of the CLIENT.

- 3.7 CLIENT is required to maintain equipment per manufacturer's recommendations.
- 3.8 CLIENT will annually facilitate and coordinate utility meter testing if required including providing a listing of all meters installed in the system, providing access, notification and scheduling of meter replacements as deemed necessary by the CLIENT.

Article 4: Measurement and Verification Plan

4.1 General Overview

- (a) The purpose of this Measurement and Verification (M&V) article is to identify the methods, measurements, procedures, and tools which will be used to verify the savings for each FIM.
- (b) The actual Guaranteed Savings associated with this Agreement are Article 1 of this Exhibit.
- (c) Savings realized during the Construction Period will use Option A for M&V. Once the Construction Period expires, the M&V options will follow those listed in Article 1 of this Exhibit.
- (d) Pertinent Electric, Water, and Natural Gas utility meters will be tracked for CLIENT'S informational purposes only.
- (e) Two site visits per year will be performed to review FIM performance, but not all FIMs will be inspected every year. FIMs will be inspected on rotating basis as determined by SIEMENS. SIEMENS will also identify energy conserving practices, as well as areas for improvement in reducing energy consumption.
- (f) A quarterly update report will be submitted to the CLIENT with informational utility bill tracking and updated Option A, B and E energy savings reports. An annual reconciliation report will be submitted reporting all energy savings. These reports will be provided within sixty (60) days of each quarterly period.
- (g) If required, Baseline adjustments shall be calculated and applied by SIEMENS for the following, but are not limited to: weather; new buildings constructed; changes in facility operation and/or schedules; removal of equipment detailed in Exhibit A; student and faculty population changes; and miscellaneous plug load changes.

The M&V Plan for each individual FIM described in Exhibit A, Article 1, is as follows:

4.2 Main Campus Boiler Plant Upgrades

MEASUREMENT & VERIFICATION OPTION A

Description

The two existing boilers will be abandoned in place and four new high efficiency condensing boilers will be installed in a nearby location. The existing gas line and hot water piping will be reconnected to the new boilers package. The four new 4000 MBH boilers will be 96% nominally rated efficiency condensing natural gas boilers. The boilers will be piped in a variable primary/variable secondary configuration. The boilers will be controlled from a master boiler controller that is factory packaged on the new boilers. The boiler controller will monitor boiler efficiencies and modulate boiler water flows and firing rates to maintain the optimal efficiency.

The existing natural gas boilers were run intermittently throughout the previous years due to mechanical failures with the boilers. The gas utility data reflects the boiler down time during the heating season and the data required to be normalized to what would be expected if the boilers were in good operating order.

The boilers baseline gas usage was calculated from calibrated Trane Trace models (found in Appendix 1). The Trace models are calibrated to the existing gas usage and take into account campus type, square footage, occupancy schedules, space temperature setpoints and existing boiler type and efficiencies. The existing boilers efficiencies were tested and determined to be 75% efficient. The customer has agreed that the 75% efficiency would be reasonable for the existing boilers.

The Trane Trace models were used to determine the post installed gas usage and compared to the baseline gas usage. The post install trace models applied the available boiler manufacture efficiencies and efficiency curves for the proposed condensing boilers. The new boilers will be individually factory tested for efficiency at varying part loads. These factory tested efficiencies will be compared to the part load efficiencies applied in the Trace models. If the factory tested efficiencies are found to vary from the manufactures data applied in the Trace model, the factory tested efficiencies will be applied to the Trace model to determine the measured gas usage reduction.

The following table shows the M&V summary expected from this FIM:

Table 4.1 - M&V Guaranteed Savings Summary for the Boiler Plant Upgrade

M&V Savings Summary – Boiler Plant Upgrade – TCC Main Campus - City of Tallahassee Utility							
	Electric Energy Reduction (kWh)	Electric Power Reduction (kW)	Natural Gas Reduction (Therms)	Water Consumption Reduction (kGals)	Sewer Consumption Reduction (kGals)	Operational Savings	Total Utility Reduction (Dollars)
Units	136,249	196	34,178	-	-		
Rate*	\$0.0600	\$12.7211	\$0.7048	\$1.8320	\$0.0000		
Dollars	\$8,175	\$2,490	\$24,090	\$0	\$0	\$0	\$34,755

Calculations

The savings calculated from this FIM is derived from the energy model generated for the new Heating Hot Water Plant.

The predicted savings for this FIM is the mathematical difference of the annual baseline Therms of the baseline system (modeled existing heating hot water plant operation) and the annual Therms of the proposed system (modeled proposed heating hot water plant operation) using Trane Trace 6.3. The Trane Trace models for the proposed new heating hot water plant were created using manufacturer provided boiler equipment specifications with full load and part load performance data, as well as other major equipment basis of design information. Additionally, local annual weather conditions for the Tallahassee were programmed into the model to generate the calculated savings for proposed hot water boilers usage.

The Trane Trace model files are located in – Appendix 1

Siemens will obtain the boiler factory part load efficiency tests and verify they are within 5% of meeting or exceeding the proposed condensing boiler efficiencies as listed in Table 4.2.3 below. If the actual factor test results are not within 5% of the listed proposed condensing boiler part load efficiencies listed in Table 4.2.3, Siemens will update the energy model with the actual factory boiler efficiencies and rerun the energy model to determine the actual factor test results adjusted energy savings. The energy modeled baseline heating load will remain constant for the pre and post measurements.

Calculations Variables Index

The Trane Trace model files applying the key variables are located in – Appendix 1

The key efficiency calculations variables are return water temperature and percent boiler load.

The existing non condensing boilers have an agreed to nominal efficiency of 75%. The non condensing boilers efficiency remains relatively constant throughout the boiler load applied. The existing boilers are suspected to have significant fouling on the waterside tubes and an inefficient gas burn due to an excessive air to fuel ratio. The non condensing boilers require a 140F or higher return water temperature to keep the water vapor from condensing in the flue stack. The existing hot water system is designed to be a 40F difference between the supply and return water temperatures. This requires the supply water to constantly operate at 180F or greater.

The new condensing boilers have a varying increase in efficiency once the return water is 140F or less. The nominal efficiency of the proposed boilers is factory rated at 96%.

Measurement or Reference Tables

The Trane Trace model files are located in – Appendix 1

Table 4.2.3 - Proposed Condensing Boiler Efficiencies

Load	Return Water Temperature F			
	80F	100F	120F	140F
20%	99.6%	96.0%	93.0%	90.0%
40%	98.8%	95.5%	91.7%	89.8%
60%	98.7%	94.1%	90.8%	89.5%
80%	96.8%	93.1%	89.7%	89.3%
100%	96.1%	92.0%	89.0%	88.8%
40F Difference: Supply - Return Temperature F				

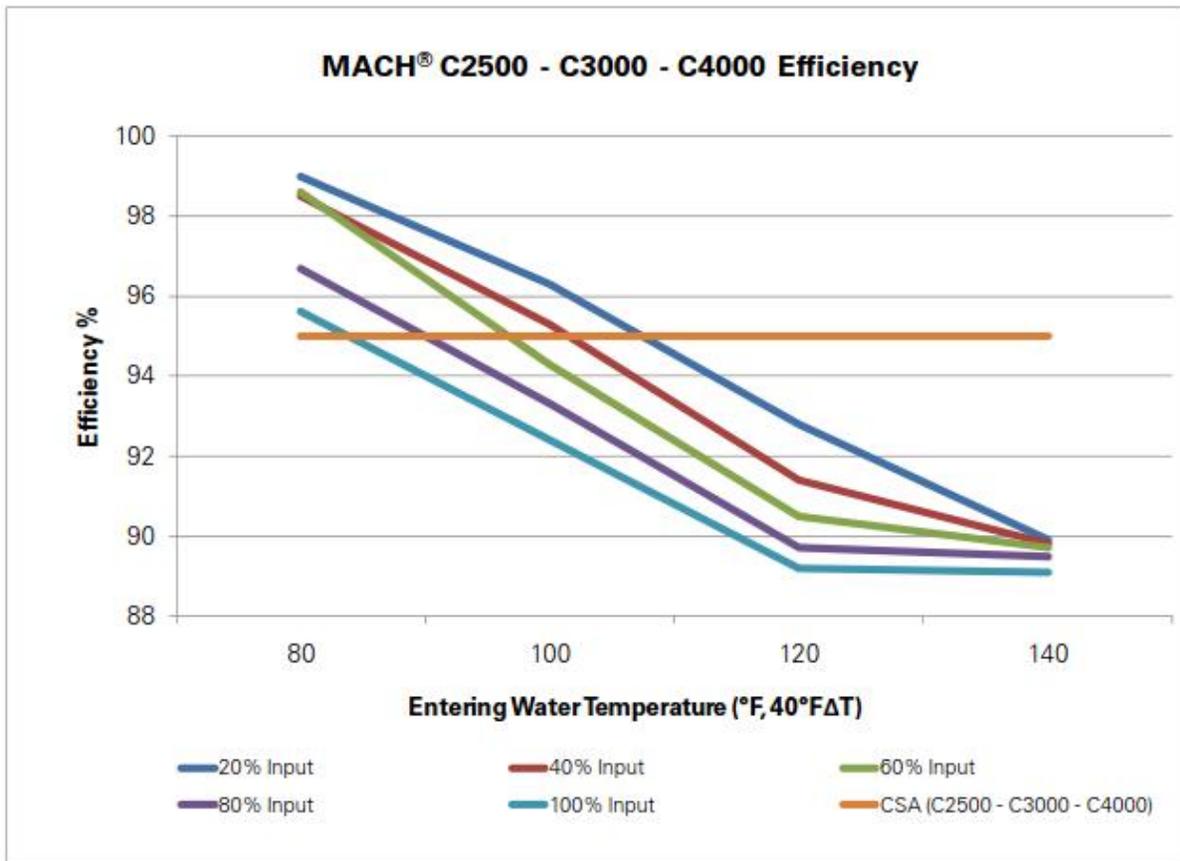


Figure 4.2.1 - Mach C4000 Boiler Part Load vs Entering Water Temperature Efficiency

This data was established using a flow rate corresponding to 40°DT at full output. The efficiencies shown are actual input versus output thermal efficiencies

Responsibility for SIEMENS and CLIENT

Siemens will apply and validate boiler factory test values post construction. Siemens will verify the proposed boilers optimal controls sequences have been met as designed.

It shall be the responsibility of the CLIENT to notify SIEMENS of any problems with the FIMs and to provide the necessary access to equipment and systems affected. SIEMENS shall then determine the best course of action to ensure occupant comfort and to maintain the Guaranteed Savings. Unintended or intended changes in operation of systems associated with these FIMs by the CLIENT may require Baseline adjustments.

Specifications on Measurement Tools

CSA certified efficiency factory testing will be based on operating conditions specified for testing under ANSI Z21.13/CSA 4.9.

4.3 Lighting Retrofit Project

MEASUREMENT & VERIFICATION OPTION A/E

This facility improvement measure will be implemented throughout the TCC Main, Ghazvini and FPSI campuses. For a detailed room by room description per building, see the Exhibit A lighting retrofit section.

Electrical energy and demand savings will be produced from this FIM. Cooling energy savings for the HVAC system is an additional benefit of the lighting retrofit.

The variables affecting savings from this lighting FIM are fixture wattages, hours of operation, and level of coincident operation. Pre-retrofit and post-retrofit fixture wattages will be determined from a standard table of wattages or from manufacturer’s data or from actual measurements and annual operating hours will be estimated based on CLIENT-provided data, which was verified during the Site Investment Grade Audit (“IGA”).

Option A has been selected for this FIM due to the high confidence with which the fixture demand and operating hours can be determined. Equipment numbers and locations will not vary, and operating hours are not projected to change after the FIM is implemented.

SIEMENS uses Option A because of the ability for the isolation of the key parameter, wattage of the lighting fixture, which is affected during the retrofit. Wattage reduction in lighting fixtures is the primary parameter for energy savings for this FIM. Cooling savings resulting from the lighting retrofit have been calculated using standard industry practices and will not be measured; these savings are to be reported under Option E.

The following table shows the M&V summary expected from this FIM:

Table 4.3.1 - M&V Guaranteed Savings Summary for All Campus Lighting Retrofit

M&V Savings Summary – Lighting Retrofit – TCC All Campuses - City of Tallahassee Utility							
	Electric Energy Reduction (kWh)	Electric Power Reduction (kW)	Natural Gas Reduction (Therms)	Water and Sewer Consumption Reduction (kGals)	Calculated Cooling Energy Savings (kWh)	Operational Savings	Total Reduction (Dollars)
Units	2,182,189	7,021	-	-	421,498		
Rate*	\$0.0634	\$11.7431	\$0.0000	\$0.0000	\$0.0642		
Dollars	\$138,304	\$82,454	\$0	\$0	\$27,079	\$40,173.00	\$288,010

Table 4.3.2 - M&V Guaranteed Savings Summary for the Main Campus Lighting Retrofit

M&V Savings Summary – Lighting Retrofit – TCC Main Campus - City of Tallahassee Utility							
	Electric Energy Reduction (kWh)	Electric Power Reduction (kW)	Natural Gas Reduction (Therms)	Water and Sewer Consumption Reduction (kGals)	Calculated Cooling Energy Savings (kWh)	Operational Savings	Total Reduction (Dollars)
Units	1,671,086	5,252	-	-	298,738		
Rate*	\$0.0600	\$12.7211	\$0.0000	\$0.0000	\$0.0600		
Dollars	\$100,299	\$66,806	\$0	\$0	\$17,930	\$30,515	\$215,550

Table 4.3.3 - M&V Guaranteed Savings Summary for Ghazvini Campus Lighting Retrofit

M&V Savings Summary – Lighting Retrofit – TCC Ghazvini Campus - City of Tallahassee Utility							
	Electric Energy Reduction (kWh)	Electric Power Reduction (kW)	Natural Gas Reduction (Therms)	Water and Sewer Consumption Reduction (kGals)	Calculated Cooling Energy Savings (kWh)	Operational Savings	Total Reduction (Dollars)
Units	117,707	455	-	-	27,157		
Rate*	\$0.0606	\$12.7243	\$0.0000	\$0.0000	\$0.0606		
Dollars	\$7,133	\$5,790	\$0	\$0	\$1,645	\$2,734	\$17,303

Table 4.3.4 - M&V Guaranteed Savings Summary for FPSI Campus Lighting Retrofit

M&V Savings Summary – Lighting Retrofit – TCC FPSI Campus No Dorms - City of Tallahassee Utility							
	Electric Energy Reduction (kWh)	Electric Power Reduction (kW)	Natural Gas Reduction (Therms)	Water and Sewer Consumption Reduction (kGals)	Calculated Cooling Energy Savings (kWh)	Operational Savings	Total Reduction (Dollars)
Units	347,740	1,104	-	-	73,724		
Rate*	\$0.0785	\$7.4988	\$0.0000	\$0.0000	\$0.0785		
Dollars	\$27,290	\$8,278	\$0	\$0	\$5,786	\$6,309	\$47,662

Table 4.3.5 - M&V Guaranteed Savings Summary for FPSI Dorms Lighting Retrofit

M&V Savings Summary – Lighting Retrofit – TCC FPSI Campus Dorms - City of Tallahassee Utility							
	Electric Energy Reduction (kWh)	Electric Power Reduction (kW)	Natural Gas Reduction (Therms)	Water and Sewer Consumption Reduction (kGals)	Calculated Cooling Energy Savings (kWh)	Operational Savings	Total Reduction (Dollars)
Units	45,656	211	-	-	21,879		
Rate*	\$0.0785	\$7.4911	\$0.0000	\$0.0000	\$0.0785		
Dollars	\$3,583	\$1,580	\$0	\$0	\$1,718	\$615	\$7,496

*The rate shown is a blended rate of the total dollars saved per units saved.

LIGHTING FIM CALCULATIONS

The M&V plan for this retrofit assumes:

- Operating hours for the lighting fixtures will be equivalent before and after the equipment retrofit.
- Fixture wattages before and after the retrofit will be determined from a standard table of wattages or from manufacturer’s data, if direct measurement is not deemed possible.
- Effects on cooling equipment from the lighting retrofit are considered.

The pre-retrofit operating hours (pre-runtimes) measurements were taken from a CLIENT produced spreadsheet during the IGA phase. These runtimes were verified for accuracy during the IGA.

Table 4.3.6 below shows, per Campus, the pre and post energy consumption for the lighting retrofit FIM. The energy consumption (kWh) and power demand (kW) reduction shown on this table is at 100%; however, the guaranteed amount will be 95% of the total amount. The guaranteed amount is listed in the Tables above.

Table 4.3.6 - Lighting Savings Units by Campus

<i>Building / Site</i>	<i>Existing kWh</i>	<i>Existing kW</i>	<i>Proposed kWh</i>	<i>Proposed Kw</i>	<i>Lighting kWh Reduction</i>	<i>Lighting kW Reduction</i>	<i>HVAC kWh Savings</i>	<i>Lighting + HVAC Total kWh Savings</i>
TCC Main Campus	3,689,068	1,087.10	1,930,029	626.39	1,759,038	5,528	314,461	2,073,499
Ghazvini Campus	294,737	93.01	170,835	53.08	123,902	479	28,586	152,488
FPSI No Dorm Bldgs	898,701	234.34	532,659	137.52	366,042	1,162	77,604	443,646
FPSI Only Dorm Bldgs	99,867	46.64	51,808	28.16	48,059	222	23,031	71,091
Totals	4,982,373	1,461	2,685,332	845	2,297,042	7,391	443,683	2,740,725

Table 4.3.7 - Lighting Savings Dollars by Campus

<i>Building / Site</i>	<i>\$/kWh Rate</i>	<i>\$/kWd Rate</i>	<i>kWh - \$ Reduction</i>	<i>kW - \$ Reduction</i>	<i>Lighting \$ Savings</i>	<i>HVAC \$ Savings</i>	<i>Lighting + HVAC Total \$ Savings</i>	
TCC Main Campus	\$0.0600	\$12.7200	\$105,577	\$70,322	\$175,900	\$18,874	\$194,774	
Ghazvini Campus	\$0.0606	\$12.7200	\$7,508	\$6,095	\$13,603	\$1,732	\$15,336	
FPSI No Dorm Bldgs	\$0.0785	\$7.5000	\$28,727	\$8,714	\$37,441	\$6,090	\$43,531	
FPSI Only Dorm Bldgs	\$0.0785	\$7.5000	\$3,772	\$1,663	\$5,435	\$1,808	\$7,242	
			Totals	\$145,585	\$86,794	\$232,378	\$28,504	\$260,883

Calculations

Savings for the lighting upgrade will be determined by using a spreadsheet model incorporating room-by-room survey results of fixture quantity and type, calculated operating hours based upon engineering and measurements performed during the project development and unit costs factors from utility rates. Room-by-room survey results and calculation spreadsheets are located in Appendix 3 “TCC Lighting Savings Analysis (Campus Location)”.

KW Savings = Pre KW Measurement – Post KW Measurement

Annual KWH Savings = (Pre Lighting Burn Hours x Pre KW Measurement) – (Post Lighting Burn Hours x Post KW Measurement)

Annual KW Demand Savings = KW savings x demand months

Annual Dollar Savings (\$) = (KWH Savings x \$/KWH Rate) + (kW demand savings x \$/kW rate)

Calculations Variables Index / Baseline Values

Pre Lighting Burn Hours – see Appendix 3 “TCC - Lighting Saving Analysis Burn Hours.pdf”

Guaranteed KW reductions per Campus – see Table 4.3.1 within this section.

Measurement or Reference Tables

Average KW per Fixture Type Pre – Refer to 80/20 Statistical Guideline for Sample

Average KW per Fixture Type Post – Refer to 80/20 Statistical Guideline for Sample

Responsibility for CLIENT

Lamp and ballast replacements post-retrofit per specifications

Specifications on Measurement Tools

Watt meter calibrated according to manufacturer specifications

During the IGA, a lighting audit was completed which inventoried fixture counts by type. This inventory of all existing lighting equipment is provided in Appendix 3.

POST INSTALLATION CONSTRUCTION PERIOD M&V ACTIVITIES

The evaluations of the pre and post watt measurements will be taken with a watt meter according to an 80% (confidence) / 20% (precision) sampling plan to measure the upgraded lighting fixtures. The table below illustrates the effect of confidence and precision on sample size.

Table 4.3.8 - 80% (confidence) / 20% (precision) Sampling Plan Guide

		Population Size, N	Sample Size, n	Population Size, N	Sample Size, n
		4	3	40	9
		8	5	45	9
		12	6	50	10
		16	7	60	10
		20	8	70	10
		25	8	90	10
		30	9	100	10
		35	9	125	11

Precision	0.2
Confidence	0.8
Z-Statistic	1.282

The one-time calculations are used to determine the amount of Savings for the entire period of the Performance Guarantee Period.

PERFORMANCE GUARANTEE PERIOD VERIFICATION ACTIVITIES

Visual inspection of the lighting will be completed to ensure they are performing per the original design intent.

4.4 Lighting Occupancy Sensors

MEASUREMENT & VERIFICATION OPTION A

Option A has been selected for this retrofit due to the high confidence with which the operating hours may be determined and equipment numbers and locations will not vary materially. The lighting sensor FIM key parameter is operating hours of the affected lighting systems.

SIEMENS uses Option A for the lighting sensor FIM due to the ability to isolate the key parameter, which is operating hours of the affected lighting system. Hours of operation in the affected lighting systems are the primary parameter for energy savings for this FIM. Lighting wattage and efficiency will remain constant pre and post installation of the occupancy sensors.

The post measurement of performance will be performed by verifying the function of the occupancy sensors. If the occupancy sensors are functioning as intended, the energy savings will be achieved by automatically turning off the lights during unoccupied periods..

The evaluations of the pre and post room occupancy and lighting operating hours measurements will be performed according to an 80% (confidence) / 20% (precision) sampling plan to verify the function of the occupancy sensors; please reference the sampling plan in **Table 4.3.8** of this report.

The following table shows the M&V summary expected from this FIM:

Table 4.4.1 - M&V Guaranteed Savings Summary for Lighting Sensors

M&V Savings Summary – Lighting Sensors – TCC All Campuses - City of Tallahassee Utility							
	Main Campus Electric Energy Reduction (kWh)	Ghazvini Campus Electric Energy Reduction (kWh)	FPSI Campus No Dorms Electric Energy Reduction (kWh)	FPSI Campus Only Dorms Electric Energy Reduction (kWh)			Total Reduction (Dollars)
Units	82,426	3,107	73,882	1,123			
Rate*	\$0.0600	\$0.0605	\$0.0785	\$0.0787			
Dollars	\$4,948	\$188	\$5,798	\$88	\$0	\$0	\$11,022

LIGHTING SENSORS CALCULATIONS

Savings for the occupancy sensors will be determined by using a spreadsheet model incorporating room-by-room survey results of fixture quantity and type, calculated operating

hours based upon engineering and measurements performed during the project development and unit costs factors from utility rates.

Annual KWH Savings = (Pre Lighting Burn Hours during non-occupies times x Pre KW Measurement) – (Post Lighting Burn Hours during non-occupies times x Post KW Measurement)

Annual Dollar Savings (\$) = (KWH Savings x \$/KWH Rate)

Calculations Variables Index / Baseline Values

Pre Installation Burn Hours – see Appendix 3 “TCC - Lighting Saving Analysis Burn Hours.pdf”

Measurement or Reference Tables

Average kW and kWh per Fixture Type Pre – Refer to 80/20 Statistical Guideline for Sample

Average KW and kWh per Fixture Type Post – Refer to 80/20 Statistical Guideline for Sample

Average room occupancy rate vs. lamp burn hour rate (PRE)

Average room occupancy rate vs. lamp burn hour rate (POST)

Responsibility for CLIENT

The CLIENT is responsible for maintenance of sensor settings and operation per agreement and manufacturer’s recommendations.

Specifications on Measurement Tools

Data loggers with light and occupancy sensing capabilities

POST INSTALLATION CONSTRUCTION PERIOD M&V ACTIVITIES

The one-time post measurement of performance will be performed by verifying the function of the occupancy sensors. If the occupancy sensors are functioning as intended, the energy savings will be achieved by automatically turning off the lights during unoccupied periods

A report will be generated from verification information to demonstrate the occupancy sensors are performing as expected. The report will contain information showing the lighting systems powering on and off with occupancy, confirming the sensors are working.

PERFORMANCE GUARANTEE PERIOD VERIFICATION ACTIVITIES

Visual inspection of the occupancy sensors will be completed to ensure they are performing per the original design intent.

4.5 Domestic Water Upgrade

MEASUREMENT & VERIFICATION OPTION A

The variables affecting savings from this water FIM are fixture flow rates, consumption per flush, and hours of operation. Fixture consumption per flush or fixture flow rates will be determined from a standard table of manufacturer’s data listing consumption and flow rates, if measurement is not possible. Total annual usage will be estimated based on short-term monitored data.

SIEMENS uses Option A because of the ability for the isolation of the key parameter, fixture flow rate and/or water per flush, for the water conservation FIM. Fixture flow rate is the primary parameter for water savings for this FIM. An additional savings is generated from the reduced amount of energy used for the production of hot water due to the lower fixture flow rates, post retrofit. Electric energy savings has been calculated and will not be measured; instead, energy savings from reduced hot water production will follow Siemens M&V Option E.

The following table shows the M&V summary expected from this FIM:

Table 4.5.1 - M&V Guaranteed Savings Summary for Domestic Water Upgrades

M&V Savings Summary – Water Upgrade – TCC All Campuses - City of Tallahassee Utility							
	Main Campus Electric Energy Reduction (kWh)	FPSI Campus No Dorms Electric Energy Reduction (kWh)	FPSI Campus Only Dorms Electric Energy Reduction (kWh)	Main Campus Water Reduction (kGal)	FPSI Campus No Dorms Water Reduction (kGal)	FPSI Campus Only Dorms Water Reduction (kGal)	Total Reduction (Dollars)
Units	118,828	44,584	116,237	2,121	475	1,346	
Rate*	\$0.0669	\$0.0785	\$0.0785	\$7.9682	\$7.2340	\$7.2343	
Dollars	\$7,945	\$3,502	\$9,125	\$16,903	\$3,436	\$9,738	\$50,649

Electric energy savings are derived from hot water savings from the urinal, toilet, shower, sink and aerator upgrades. The calculations for these savings are provided within the FIM calculations in the IGA.

WATER FIM CALCULATIONS

The M&V plan for this FIM assumes:

- Operating usage for the plumbing fixtures will be equivalent before and after the equipment retrofit.
- Fixture consumption per flush and flow rates before and after the retrofit will be determined from a standard table of consumption per flush and flow rates or from manufacturer’s data, if it is not deemed measurable.

Annual Water Savings (Gallons):

$$\text{Toilets and Urinals} = (\text{Pre Gallons per Flush} - \text{Post Gallons per Flush}) \times \text{Frequency per}$$

Occupant x Number of Occupants x Days per Year

Sinks / Shower Heads = (Pre Flow Rate GPM – Post Flow Rate GPM) x Avg. Time of Use x Frequency per Occupant x Number of Occupants x Days per Year

Dish Sink = (Pre Flow Rate GPM – Post Flow Rate GPM) x Avg. Time of Use per Day x Days per Year

Annual Heating Saving (MMBTU) = Gallons per Year x (Hot Water Temperature – City/Well Water Temperature) x 8.346 lbs/gal / Heater Efficiency / 1,000,000

Annual Dollar Saving (\$) = (Gallons Saved) x (Water Rate \$/gal + Sewer Rate \$/gal) + MMBTU Savings x (1/MMBTU/Unit of Fuel) x \$/ Unit of Fuel

Water savings and energy savings from hot water production are expected to be obtained as a result of these FIMs as shown in the analysis for water upgrades. Option A focuses on the isolation of a key operating parameter for a piece of equipment or system. The key performance factor (e.g., gallons per flush or gallons per minute) is determined with spot measurements or manufacturer's data, and operational usage (flushes per hour). Observed operational usage was documented during the initial water audit and this data is provided in the IGA.

For the detailed room by room fixture upgrade list and calculation spreadsheets, see the Appendix 5. The following table shows a portion of the input parameters used to perform the calculations to obtain energy savings from the urinal, toilet, shower, sink and aerator upgrades.

Table 4.5.2 - Main Campus Water Calculation Input Parameters

Utility Information			
Water Cost		per kgal	\$2.53
Sewage Cost		per kgal	\$5.44
Combined Cost		per kgal	\$7.97
Hot Water Source Temp	135°F	Avg Cold Water Temp	69°F
1st Fuel Source for Hot Water	% Total	100%	Electric
Electric Cost		per kWh	\$0.06551
Efficiency Factor			95%
2nd Fuel Source for Hot Water	% Total	0%	
Cost		#N/A	\$0.00
Efficiency Factor			0%
Metered Water Usage (Kgals/year)			9,374

Occupancy Analysis			Hours on	Hours on Site	Restroom
	QTY	Days on Site	Site per day	Annual Total	Uses per year
Students	10818	160	2.2	3,721,392	1,488,557
Summer Students	5606	60	1.5	504,540	201,816
Staff	1490	165	8	1,966,800	786,720
Summer Staff	1490	60	8	715,200	286,080
				Total	2,763,173

Table 4.5.3 - FPSI Campus Water Calculation Input Information

Utility Information				CCFs
Water Cost		per kgal	\$3.03	\$ -
Sewage Cost		per kgal	\$4.21	\$ -
Combined Cost		per kgal	\$7.24	
Hot Water Source Temp	135°F	Avg Cold Water Temp	69°F	
1st Fuel Source for Hot Water	% Total	100%	Electric	
Electric Cost		per kWh	\$0.0785	
Efficiency Factor			95%	
2nd Fuel Source for Hot Water	% Total	0%		
Cost		#N/A	\$0.00	
Efficiency Factor			0%	
Metered Water Usage (Kgals/year)			5,056	0
			All FPSI Meters	

Occupancy Analysis			Hours on Site per day	Hours on Site Annual Total	Restroom Uses per year
	QTY	Days on Site			
Students	699	160	2.2	240,456	96,182
Summer Students	373	60	1.5	33,570	13,428
Staff	100	165	8	132,000	52,800
Summer Staff	100	60	8	48,000	19,200
				Total	181,610
Dorms	400	224	8	716,800	286,720
Summer Dorm	200	84	8	134,400	53,760
				Total	340,480

The Table 4.5.4 below details the water savings for this FIM. The total water consumption reduction shown on these tables is at 100%; however, the guaranteed amount will be 95% of the total amount shown in the Figure.

Table 4.5.4 - FPSI Campus Water Savings Analysis per Campus

Building		Current Consumption		Consumption After Upgrade		Annual Savings				
Name	Number Of Fixtures Analyzed	Annual Water kGals	Annual MMBTU's Energy Usage	Annual Water kGals	Annual MMBTU's Energy Usage	Annual Water kGals	Annual Energy MMBTU	Annual Energy kWh	Water/Sewage Savings Dollars	Energy Savings Dollars
MAIN CAMPUS	990	9,374	897	7,141	427	2,233	427	125,082	\$17,793	\$8,363
FPSI CAMPUS - No Dorm Buildings	212	2,156	320	1,656	159	500	160	46,931	\$3,617	\$3,686
FPSI CAMPUS - Only Dorm Buildings	719	2,900	714	1,483	296	1,417	418	122,355	\$10,251	\$9,605
TOTALS	1,921	14,430	1,930	10,280	883	4,150	1,005	294,368	\$31,661	\$21,654

POST INSTALLATION CONSTRUCTION PERIOD M&V ACTIVITIES

The water retrofit savings will be validated by pre and post representative fixture consumption measurements.

The evaluations of the pre and post water consumption measurements will be taken with an appropriate tool according to an 80% (confidence) / 20% (precision) sampling plan to measure the water fixtures. The table below illustrates the effect of confidence and precision on sample size.

Table 4.5.5 - 80% (confidence) / 20% (precision) Sampling Plan Guide

	Population Size, N	Sample Size, n	Population Size, N	Sample Size, n
	4	3	40	9
	8	5	45	9
	12	6	50	10
	16	7	60	10
	20	8	70	10
	25	8	90	10
	30	9	100	10
	35	9	125	11

Precision	0.2
Confidence	0.8
Z-Statistic	1.282

Table 4.5.6 - Fixture Types, Counts per Type and Sampling Quantities Required

Water Fixtures and Devices Part Descriptions	Code	MAIN CAMPUS	GHAZVINI	FPSI No Dorm	FPSI Only Dorm	TOTALS	Samples
Restroom Faucet - Installation of 0.5 GPM flow restrictor	A1	193	34	44	0	271	11
Faucet - Replace Std & Single Spigot, cold only with Delay Close (push button) Faucet	F1	1	0	0	0	1	1
Water Closet - Installation of new 1.6 GPF water closet and flush valve	T1	2	0	7	2	11	5
General Purpose Faucet - Installation of 1.5 GPM flow restrictor	A2	48	2	2	0	52	10
Showers - Replace with new low flow shower heads	S1	17	0	0	249	266	11
Sinks - Installation of Pedal Valve model S2A/S2B on Sink	P1	7	0	8	0	15	6
Sinks - Installation of Pedal Valve model S2A/S2B on Sink + 1.5 GPM flow restrictor	P2	47	26	3	0	76	10
Installation of ChillTech heat exchanger unit on ice machine	ICE1	8	0	1	0	9	5
Showers - Institutional - Replace with new low flow shower heads	S2	34	0	0	0	34	9
Installation of new low-flow 1.15 GPM kitchen sprayer	KSP	1	0	0	0	1	1
Installation of .125 GPF "pint-sized" urinal and flush valve	U5	119	6	28	0	153	11
Installation of specialized 1.6 GPF wall-mount tank toilet	T3	0	0	0	33	33	9
General Purpose Faucet - Installation of 1.0 GPM flow restrictor	A3	0	0	0	233	233	11
	Totals	477	68	93	517	1155	100

PERFORMANCE GUARANTEE PERIOD VERIFICATION ACTIVITIES

Visual inspection of the water retrofits will be performed annually to ensure operation as designed. Additionally, SIEMENS will perform post measurement activities every three years on Siemens selected fixtures and sample counts to validate fixtures are operating within the FIM design criteria. The results of the water fixture measurements will be provided to the customer. These additional measurements and results are informational only and will not impact the performance guarantee.

Note: Costs of energy are defined in Article 6, Utility Rate Structures and Escalation Rates.

4.6 **Option B - Retrofit Isolation: All Parameter Measurement**

4.6.1 **Siemens Demand Flow® – Chiller Plant Optimization**

Description:

The chilled water plant optimization FIM will improve the chiller plant system efficiencies. The resulting savings will be determined by measuring chiller system energy consumption resulting from improved operating efficiencies.

Improved chiller plant efficiency will result from implementation of the Demand Flow® FIM. Savings will result from operating the chiller plant at near design temperature conditions at all times. The resulting efficiency improvement will be measured on a continuous basis and recorded using EMC through the Siemens Apogee building automation system (BAS).

Chiller Plant efficiency improvements will be realized by varying the flow on both the evaporator and condenser sections of the chiller system in an effort to operate the chiller(s) at near design temperature conditions. Additionally, chilled water and condenser water setpoints will be controlled to efficiently respond to changes in weather conditions and building loads.

The Chiller Plant baseline electric usage was calculated from calibrated Trane Trace models (found in Appendix 7). The Trace models are calibrated to the existing Main Campus meter electric usage and take into account campus type, square footage, occupancy schedules, space temperature setpoints and existing chiller types and efficiencies. The existing chiller plant efficiency was calculated based on available Johnson Controls EMS trend data and observations made during site audits.

The Trane Trace models were used to determine the post installed electric usage and compared to the baseline electric usage. The post install trace models applied the available chiller manufacture efficiencies and efficiency curves for the existing chillers and proposed new chiller. The new chiller will be factory tested for efficiency at varying part loads. These factory tested efficiencies will be compared to the part load efficiencies applied in the Trace models. If the factory tested efficiencies are found to vary from the manufactures data applied in the Trace model, the factory tested efficiencies will be applied to the Trace model to determine the measured electric usage reduction.

The following table shows the M&V summary expected from this FIM:

Table 4.6.1 - M&V Guaranteed Savings Summary for the Chiller Plant Upgrade

M&V Savings Summary – Chiller Plant Upgrade – TCC Main Campus - City of Tallahassee Utility							
	Electric Energy Reduction (kWh)	Electric Power Reduction (kW)	Natural Gas Reduction (Therms)	Water Consumption Reduction (kGals)	Sewer Consumption Reduction (kGals)	Operational Savings	Total Utility Reduction (Dollars)
Units	1,098,266	3,162	-	-	-		
Rate*	\$0.0600	\$12.7211	\$0.7048	\$1.8320	\$0.0000		
Dollars	\$65,896	\$40,220	\$0	\$0	\$0	\$0	\$106,116

Calculations:

The savings calculated from this FIM is derived from the model generated for the upgraded Main Campus Chilled Water Plant.

The predicted savings for this FIM is the mathematical difference of the calibrated annual baseline electrical energy (kWh) and demand (kW) of the existing system and the annual electrical energy (kWh) and demand (kW) of the proposed system using Trane Trace 6.3. The Trane Trace models for the proposed chilled water plant upgrades were created using manufacturer provided chiller equipment full load and part load performance data, as well as other major equipment basis of design information. Local annual weather condition data for Tallahassee were programmed into the model to generate the calculated savings for proposed chilled water plant usage.

The Trane Trace model files are located in – Appendix 7

Electric Energy Savings (kWh)

The ongoing Measurement and Verification of electric energy usage savings (kWh_{real}) will be calculated using an Excel spreadsheet applying the Trane Trace modeled baseline energy usage (kWh_{pre}) and production ($TonHrs_{base}$) of the Central Energy Plant (CEP). The modeled energy usage and production are used to calculate the pre (kW/Ton_{pre}) and post (kW/Ton_{calc}) retrofit monthly average CEP efficacy.

The modeled baseline CEP production ($TonHrs_{base}$) will be used as the pre and post chiller plant production (Ton-Hrs). The modeled baseline usage reflects current student population applied at a five year low. Student population is expected to increase. As the student population increases, the actual CEP production ($TonHrs_{act}$) increases and the realized cost avoidance also increases.

The proposed post improvement monthly average CEP efficacy (kW/Ton_{calc}) will be adjusted (kW/Ton_{adj}) for monthly average outdoor wet bulb temperature and monthly CEP production ($TonHrs_{act}$). These adjustments (kW/Ton_{regr}) are based on the effects of outdoor wet bulb temperature on cooling tower approach / available condenser water temperature and the varying load ($TonHrs_{act}$) of the CEP.

The adjusted proposed CEP monthly efficacy (kW/Ton_{adj}) is used to calculate the adjusted proposed monthly energy usage (kWh_{adj}) using the baseline production ($TonHrs_{base}$).

The actual CEP monthly energy consumption (kWh_{act}) and chilled water production ($TonHrs_{act}$) is measured and used to calculate actual CEP monthly efficacy (kW/Ton_{act}).

The actual CEP monthly efficacy (kW/Ton_{act}) is applied to the baseline chilled water production ($TonHrs_{base}$) to determine post retrofit monthly consumption (kWh_{post}).

The adjusted proposed energy usage (kWh_{adj}) will be compared to the pre retrofit monthly consumption (kWh_{pre}) to determine the guaranteed savings (kWh_{guar}). The post retrofit monthly consumption (kWh_{post}) will be compared to the pre retrofit consumption (kWh_{pre}) to determine the realized savings (kWh_{real}).

The guaranteed savings (kWh_{guar}) will be compared to the realized savings (kWh_{real}) to determine savings have met the guarantee.

Electric Demand Savings (kW)

The ongoing Measurement and Verification of electric demand savings (kW_{real}) will be calculated using an Excel spreadsheet applying the Trane Trace modeled baseline CEP monthly peak production rate ($Tons_{base}$), (kW/Ton_{pre}), (kW/Ton_{adj}) and (kW/Ton_{act}).

The modeled baseline CEP monthly production rate ($Tons_{base}$) will be used as the pre and post monthly production rate.

The CEP monthly peak production rate ($Tons_{base}$) is multiplied by the monthly peak production rate efficacy ($kW/Ton_{peak-pre}$) to determine the baseline CEP monthly demand (kW_{pre}). The monthly peak production rate efficacy ($kW/Ton_{peak-pre}$) is calculated based on 125% of the monthly average CEP efficacy (kW/Ton_{pre}). The 125% value is based on the average monthly modeled increase of the plant efficacy (kW/Ton_{pre}) at peak monthly production rate ($Tons_{base}$).

The CEP monthly production rate ($Tons_{base}$) is multiplied by the monthly ($kW/Ton_{peak-adj}$) to determine the guaranteed CEP monthly demand (kW_{guar}).

The CEP monthly production rate ($Tons_{base}$) is multiplied by the monthly ($kW/Ton_{peak-act}$) to determine the realized CEP monthly demand (kW_{real}).

The guaranteed demand savings (kW_{guar}) is compared to the realized demand savings (kW_{real}) to determine savings have met the guarantee.

Formulas for Energy (kWh) Savings:

Modeled monthly and annual total ton hours and kilowatt hours presented in Table 4.6.2.

$TonHrs_{base}$ = Modeled baseline ton hours of existing CEP

kWh_{pre} = Modeled kilowatt hours of existing CEP

$kW/Ton_{pre} = kWh_{pre} / TonHrs_{base}$

kWh_{calc} = Modeled ton hours of proposed CEP

$kW/Ton_{calc} = kWh_{calc} / TonHrs_{base}$

$kW/Ton_{reg} = ay^2+bx+c$ (Regression formula adjustment applying actual average monthly outdoor wet bulb temperature (y) and actual CEP ton hours (x) or ($TonHrs_{act}$))

$$\begin{aligned} \text{kW/Ton}_{\text{adj}} &= \text{kW/Ton}_{\text{calc}} + \text{kW/Ton}_{\text{regr}} \\ \text{kW/Ton}_{\text{adj}} &= \text{Max}(\text{kW/Ton}_{\text{base}}, \text{kW/Ton}_{\text{adj}}) \\ \text{kWh}_{\text{adj}} &= \text{kW/Ton}_{\text{adj}} \times \text{TonHrs}_{\text{base}} \end{aligned}$$

$$\begin{aligned} \text{kWh}_{\text{act}} &= (\text{kWh}_R)_{\text{Chiller System A}} + (\text{kWh}_R)_{\text{Chiller System B}} + (\text{kWh}_R)_{\text{Chiller System C}} + \dots \\ \text{TonHrs}_{\text{act}} &= \text{Ton Hours of CEP (Measured Value)} \\ \text{kW/Ton}_{\text{act}} &= \text{kWh}_{\text{act}} / \text{TonHrs}_{\text{act}} \\ \text{kWh}_{\text{post}} &= \text{kW/Ton}_{\text{act}} \times \text{TonHrs}_{\text{base}} \end{aligned}$$

$$\begin{aligned} \text{kWh}_{\text{guar}} &= \text{kWh}_{\text{pre}} - \text{kWh}_{\text{adj}} \text{ (Guarantee)} \\ \text{kWh}_{\text{real}} &= \text{kWh}_{\text{pre}} - \text{kWh}_{\text{post}} \text{ (Realized)} \\ \text{kWh}_{\text{diff}} &= \text{kWh}_{\text{guar}} - \text{kWh}_{\text{real}} \text{ (Difference)} \end{aligned}$$

$$\begin{aligned} \text{kW}_{\text{pre}} &= \text{Tons}_{\text{base}} \times \text{kW/Ton}_{\text{peak-pre}} \text{ (Baseline)} \\ \text{kW}_{\text{guar}} &= \text{Tons}_{\text{base}} \times \text{kW/Ton}_{\text{peak-adj}} \text{ (Guarantee)} \\ \text{kW}_{\text{real}} &= \text{Tons}_{\text{base}} \times \text{kW/Ton}_{\text{peak-act}} \text{ (Realized)} \\ \text{kW}_{\text{diff}} &= \text{kW}_{\text{guar}} - \text{kW}_{\text{real}} \text{ (Difference)} \end{aligned}$$

Formulas for Cost (\$) Saving:

$$\begin{aligned} \text{Total \$ Energy Savings} &= (\text{kWh}_{\text{real}} * \$/\text{kWh}_{\text{contract}}) \\ \text{Total \$ Demand Savings} &= (\text{kW}_{\text{real}} * \$/\text{kWh}_{\text{contract}}) \end{aligned}$$

Where:

$\text{TonHrs}_{\text{base}}$ = Measured and Trace modeled calibrated baseline ton hours of existing chiller system cooling production prior to retrofit project.

kWh_{pre} = Trace modeled kilowatt hours of existing chiller system energy consumption (kWh) prior to retrofit project. Includes chillers, chilled water pumps, condenser water pumps, and cooling tower/condenser fans system. Based on utility and trend data collected in the pre-retrofit period.

kWh_{calc} = Trace modeled ton hours of proposed chiller system energy consumption (kWh) after retrofit project

$\text{kW/Ton}_{\text{regr}}$ = ay^2+bx+c (Regression formula adjustment applying actual average monthly outdoor wet bulb temperature (y) and actual CEP ton hours (x) or ($\text{TonHrs}_{\text{act}}$))

$\text{TonHrs}_{\text{act}}$ = Measured values of Ton Hours of chiller system cooling production after retrofit project.

kWh_{act} = Measured values of kilowatt hours of chiller system energy consumption (kWh) after retrofit project. Includes chillers, chilled water pumps, condenser water pumps, and cooling tower/condenser fans system. Based on utility and trend data collected in the post-retrofit period.

kWh_{post} = Kilowatt hours of chiller system energy consumption (kWh) after retrofit project with the actual chiller system efficacy (kW/Ton) applied to the baseline ton hours.

$\text{Tons}_{\text{base}}$ = Measured and Trace modeled calibrated baseline tonnage of existing chiller system prior to retrofit project.

$\$/\text{kWh}_{\text{contract}}$ = cost of electric energy based on analysis of rate schedule, fuel costs, and projected escalations if applicable

Table 4.6.2 Pre Retrofit Calibrated Baseline CEP Performance Data

Month	OADBT	OAWBT	Plant Load	Total CEP	Average	Peak Tons	Peak Tons	Demand
	deg F	deg F	Ton-Hrs	kWh	kW/Ton	Tons	kW/Ton	kW
JANUARY	50	46	42,291	75,334	1.781	167	2.229	373
FEBRUARY	55	49	72,718	96,205	1.323	318	1.655	527
MARCH	62	56	211,859	189,498	0.894	419	1.119	469
APRIL	67	59	308,711	243,478	0.789	631	0.987	622
MAY	73	67	574,080	414,758	0.722	1,135	0.904	1,026
JUNE	79	74	727,772	576,884	0.793	1,486	0.992	1,474
JULY	81	76	826,647	666,470	0.806	1,634	1.009	1,648
AUGUST	80	74	765,259	607,994	0.794	1,513	0.994	1,503
SEPTEMBER	76	70	646,741	479,752	0.742	1,321	0.928	1,226
OCTOBER	66	60	331,076	254,713	0.769	654	0.963	630
NOVEMBER	62	57	206,587	182,549	0.884	422	1.106	466
DECEMBER	51	47	49,755	79,963	1.607	197	2.011	395
Total / Average	67	61	4,763,495	3,867,600	0.812	1,634	1.016	10,359

Table 4.6.3 Post Retrofit CEP Performance Data

Month	OADBT	OAWBT	Plant Load	Total CEP	Average	Peak Tons	Peak Tons	Demand
	deg F	deg F	Ton-Hrs	kWh	kW/Ton	Tons	kW/Ton	kW
JANUARY	50	46	42,291	25,509	0.603	167	0.755	126
FEBRUARY	55	49	72,718	37,778	0.520	318	0.650	207
MARCH	62	56	211,859	106,398	0.502	419	0.628	263
APRIL	67	59	308,711	163,303	0.529	631	0.662	417
MAY	73	67	574,080	332,641	0.579	1,135	0.725	823
JUNE	79	74	727,772	441,973	0.607	1,486	0.760	1,129
JULY	81	76	826,647	509,496	0.616	1,634	0.771	1,260
AUGUST	80	74	765,259	464,824	0.607	1,513	0.760	1,149
SEPTEMBER	76	70	646,741	384,762	0.595	1,321	0.744	983
OCTOBER	66	60	331,076	173,087	0.523	654	0.654	428
NOVEMBER	62	57	206,587	105,914	0.513	422	0.641	271
DECEMBER	51	47	49,755	28,493	0.573	197	0.716	141
Total / Average	67	61	4,763,495	2,774,180	0.582	1,634	0.729	7,198

Table 4.6.4 Post Retrofit CEP Performance Savings Data

Month	OADBT	OAWBT	Plant Load	Total CEP	Average	Peak Tons	Peak Tons	Demand
	deg F	deg F	Ton-Hrs	kWh	kW/Ton	Tons	kW/Ton	kW
JANUARY	50	46	42,291	49,825	1.178	167	1.474	246
FEBRUARY	55	49	72,718	58,427	0.803	318	1.005	320
MARCH	62	56	211,859	83,100	0.392	419	0.491	205
APRIL	67	59	308,711	80,175	0.260	631	0.325	205
MAY	73	67	574,080	82,117	0.143	1,135	0.179	203
JUNE	79	74	727,772	134,911	0.185	1,486	0.232	345
JULY	81	76	826,647	156,974	0.190	1,634	0.238	388
AUGUST	80	74	765,259	143,170	0.187	1,513	0.234	354
SEPTEMBER	76	70	646,741	94,989	0.147	1,321	0.184	243
OCTOBER	66	60	331,076	81,626	0.247	654	0.308	202
NOVEMBER	62	57	206,587	76,635	0.371	422	0.464	196
DECEMBER	51	47	49,755	51,470	1.034	197	1.294	255
Total / Average	67	61	4,763,495	1,093,419	0.230	1,634	0.287	3,162

Calculations Variables Index

The Trane Trace model files applying the key variables are located in Appendix 1

The key chiller plant efficiency calculation variables are listed below:

Chiller Plant System Tons and Ton-Hours
Secondary Chilled Water Supply Temperature (F)
Secondary Chilled Water Return Temperature (F)
Secondary Chilled Water Flow (gpm)
Chiller Plant System Electrical Energy (kWh) and Demand (kW)
Outside Air Dry-Bulb (Sensible) Temperature (F)
Outside Air Relative Humidity (RH)
Outside Air Wet-Bulb Temperature (F)

Calculation Variables Information

The following information was applied when creating the Trane Trace energy models.

The existing chillers are suspected to have some moderate fouling on the condenser water tubes and Chiller 5 has a higher approach temperature of 4F. The expected approach of the Trane 750 CVHF chiller is not greater than 2F. The higher approach temperature could indicate fouling on the condenser tubes or air in the condenser refrigerant vessel.

The existing chillers and chilled water system is designed to have a 15F difference between the evaporator supply and return and 10F difference between condenser supply and return water temperatures. The existing 15F (Delta T) chilled water design is reflected in the reduced design water flow requirements of each existing chiller. The observed (trended) chiller plant secondary supply water temperature was 43F and the secondary return water temperature was 50F at 96F outside air temperature. This is a 7F difference and the chilled water system was designed for 15F.

The existing cooling tower supply water setpoint is a constant 80F. Due to significant scaling of the cooling towers the cooling tower supply water temperature was 89F at 78F wetbulb indicating an 11F approach. The existing cooling towers design approach is 5F at 78F outdoor wetbulb temperature.

Existing Chiller 1 is proposed to be replaced due to degradation of efficiency due to condenser fouling and reliability. has an estimated efficiency of .69 kW/Ton at full load. The original Chiller 1 factory efficiency is .598 kW/Ton.

Chiller 1 will be replaced with a new high efficiency chiller. The new variable speed drive equipped chiller proposed will have a varying increase in efficiency with the condenser water supply 85F or less. The nominal factory rated efficiency of the proposed new 500 ton chiller is NPLV = 0.321 kW/Ton with 44F evaporator leaving water temperature.

Table 4.6.5 Proposed Chiller Part Load Performance Data
AHRI relief, NPLV = 0.321 (Constant Flow)

% Load	Capacity	Evap LWT	Evap FR	Evap EWT	Evap PD	Cond EWT	Cond FR	Cond LWT	Cond PD	kW	Amps	Efficiency
100	500.0	44.00	1194.4	54.00	26.23	85.00	1500.0	94.26	21.29	254.7	361.0	0.509
95	475.0	44.00	1194.4	53.50	26.26	83.00	1500.0	91.73	21.46	228.9	338.6	0.482
90	450.0	44.00	1194.4	53.00	26.29	81.00	1500.0	89.22	21.62	204.8	317.6	0.455
85	425.0	44.00	1194.4	52.50	26.31	79.00	1500.0	86.71	21.79	182.4	298.6	0.429
80	400.0	44.00	1194.4	52.00	26.34	77.00	1500.0	84.21	21.96	161.7	281.5	0.404
75	375.0	44.00	1194.4	51.50	26.36	75.00	1500.0	81.71	22.13	142.6	266.1	0.380
70	350.0	44.00	1194.4	51.00	26.38	73.00	1500.0	79.23	22.31	123.7	250.3	0.353
65	325.0	44.00	1194.4	50.50	26.41	71.00	1500.0	76.75	22.49	107.6	238.5	0.331
60	300.0	44.00	1194.4	50.00	26.44	69.00	1500.0	74.28	22.67	93.1	228.6	0.310
55	275.0	44.00	1194.4	49.50	26.46	67.00	1500.0	71.81	22.85	79.9	220.7	0.291
50	250.0	44.00	1194.4	49.00	26.48	65.00	1500.0	69.35	23.03	68.3	214.8	0.273
45	225.0	44.00	1194.4	48.50	26.51	65.00	1500.0	68.93	23.05	63.8	210.1	0.284
40	200.0	44.00	1194.4	48.00	26.54	65.00	1500.0	68.51	23.07	58.9	205.1	0.294
35	175.0	44.00	1194.4	47.50	26.56	65.00	1500.0	68.08	23.09	54.5	199.0	0.311
30	150.0	44.00	1194.4	47.00	26.59	65.00	1500.0	67.66	23.10	48.9	190.7	0.326
25	125.0	44.00	1194.4	46.50	26.62	65.00	1500.0	67.23	23.12	44.0	186.0	0.352
20	100.0	44.00	1194.4	46.00	26.64	65.00	1500.0	66.80	23.14	38.5	182.5	0.385
15	75.0	44.00	1194.4	45.50	26.67	65.00	1500.0	66.38	23.16	32.8	178.8	0.438
10	50.0	44.00	1194.4	45.00	26.69	65.00	1500.0	65.95	23.18	27.5	169.1	0.550
5	25.0	44.00	1194.4	44.50	26.73	65.00	1500.0	65.53	23.19	20.8	161.3	0.833

Trane Trace Baseline Calibration

The Trane Trace building energy simulation model of the Main Campus including the central energy plant and campus buildings connected to central energy plant was calibrated to within 5.62% of the 2015 base year Main Campus electric and gas utility data. The chiller plant condenser makeup meter shown in the baseline table below was found to be reading significantly low and was replaced by the water utility upon discovery. No chiller plant condenser water savings are applied.

Table 4.6.6 - Main Campus Trace Model Calibration

Month 2015	Baseline - Actual				Base Calibrated Trace Model			
	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal
JAN	664,800	1,704	29,370	206	604,809	1,496	28,410	132
FEB	808,800	1,692	34,128	265	575,015	1,861	19,406	223
MAR	657,600	1,944	16,667	335	734,836	2,127	12,831	622
APR	810,000	2,436	12,339	518	764,368	2,295	8,144	889
MAY	808,800	2,340	10,115	668	969,682	3,073	7,011	1,630
JUN	1,028,400	2,679	7,976	859	1,024,254	2,742	6,720	2,078
JUL	973,200	2,664	7,115	910	1,134,527	2,781	6,944	2,364
AUG	1,101,600	2,340	7,386	932	1,074,205	2,761	6,944	2,184
SEP	960,000	2,544	4,221	939	988,952	3,147	6,720	1,838
OCT	787,200	2,136	8,133	718	771,916	2,456	8,670	951
NOV	897,600	2,388	10,292	512	676,449	1,922	14,019	604
DEC	618,000	1,812	8,788	318	580,617	1,517	30,785	154
TOTAL	10,116,000	26,679	156,530	7,178	9,899,630	28,178	156,604	13,669

Differences from above

Month	Baseline - Actual				Base Calibrated Trace Model			
	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal
JAN					59,991	208	960	74
FEB					233,785	(169)	14,722	42
MAR					(77,236)	(183)	3,836	(288)
APR					45,632	141	4,195	(372)
MAY					(160,882)	(733)	3,104	(962)
JUN					4,146	(63)	1,256	(1,220)
JUL					(161,327)	(117)	171	(1,454)
AUG					27,395	(421)	442	(1,252)
SEP					(28,952)	(603)	(2,499)	(899)
OCT					15,284	(320)	(537)	(233)
NOV					221,151	466	(3,727)	(92)
DEC					37,383	295	(21,997)	164
TOTAL	0	0	0	0	216,370	(1,499)	(74)	(6,491)
					2.14%	-5.62%	-0.05%	-90.44%

Trane Trace Output Data

The Trane Trace output data is located in Appendix 1.

An energy model output summary table for each chiller plant modification is shown in the following tables. Each table represents the energy model output of the resultant campus energy usage and the difference of the before and after chiller plant modification. The energy model tables are shown to give understanding to the individual energy reductions of each Central Energy Plant (CEP) Facility Improvement Measure (FIM) applied. The groups of data shown in the tables are the sequential output of the energy modeling of each CEP FIM.

Table 4.6.7 Main Campus Chiller Plant Upgrade - Energy Reduction Units

Tallahassee Community College
Main Campus CEP
Electric Consumption and Demand, Gas and Water
Guaranteed Values in Energy Units

Month	Chiller 1 Replacement - New Chiller				Cooling Tower Replacements / Upgrades				CEP Demand Flow				Chiller 5 Rebuild			
	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal
JAN	588,978	1,447	28,410	132	588,603	1,410	28,410	132	554,314	1,269	28,410	132	554,314	1,250	28,410	132
FEB	551,392	1,796	19,406	223	550,958	1,749	19,406	223	515,983	1,565	19,406	223	515,983	1,541	19,406	223
MAR	696,827	2,086	12,831	622	695,693	2,055	12,831	622	651,211	1,937	12,831	622	651,211	1,922	12,831	622
APR	734,334	2,254	8,144	889	732,228	2,223	8,144	889	684,186	2,105	8,144	889	683,799	2,090	8,144	889
MAY	956,800	3,032	7,011	1,630	950,857	3,001	7,011	1,630	891,196	2,885	7,011	1,630	887,417	2,870	7,011	1,630
JUN	999,257	2,673	6,720	2,078	971,465	2,621	6,720	2,078	896,247	2,423	6,720	2,078	889,057	2,397	6,720	2,078
JUL	1,116,082	2,703	6,944	2,364	1,076,220	2,645	6,944	2,364	987,548	2,422	6,944	2,364	977,341	2,392	6,944	2,364
AUG	1,048,422	2,689	6,944	2,184	1,018,481	2,637	6,944	2,184	938,689	2,433	6,944	2,184	930,740	2,406	6,944	2,184
SEP	972,761	3,098	6,720	1,838	960,688	3,062	6,720	1,838	898,602	2,922	6,720	1,838	893,780	2,904	6,720	1,838
OCT	738,885	2,416	8,670	951	736,477	2,386	8,670	951	690,013	2,270	8,670	951	689,888	2,254	8,670	951
NOV	644,063	1,882	14,019	604	642,867	1,854	14,019	604	599,358	1,741	14,019	604	599,358	1,727	14,019	604
DEC	563,415	1,466	30,785	154	563,005	1,428	30,785	154	528,478	1,282	30,785	154	528,478	1,263	30,785	154
TOTAL	9,611,215	27,539	156,604	13,669	9,487,542	27,069	156,604	13,669	8,835,825	25,255	156,604	13,669	8,801,365	25,016	156,604	13,669

Differences from above

Month	Chiller 1 Replacement - New Chiller				Cooling Tower Replacements / Upgrades				CEP Demand Flow				Chiller 5 Rebuild			
	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal
JAN	15,831	50	0	0	375	37	0	0	34,289	140	0	0	0	19	0	0
FEB	23,623	65	0	0	434	48	0	0	34,975	184	0	0	0	24	0	0
MAR	38,009	41	0	0	1,134	31	0	0	44,483	118	0	0	0	15	0	0
APR	30,034	41	0	0	2,106	31	0	0	48,042	118	0	0	387	15	0	0
MAY	12,882	41	0	0	5,944	31	0	0	59,661	116	0	0	3,779	15	0	0
JUN	24,998	69	0	0	27,791	51	0	0	75,218	198	0	0	7,190	26	0	0
JUL	18,446	78	0	0	39,862	58	0	0	88,672	223	0	0	10,207	30	0	0
AUG	25,783	72	0	0	29,941	52	0	0	79,791	203	0	0	7,950	27	0	0
SEP	16,191	50	0	0	12,073	36	0	0	62,087	140	0	0	4,822	18	0	0
OCT	33,031	41	0	0	2,408	30	0	0	46,463	116	0	0	125	15	0	0
NOV	32,387	40	0	0	1,195	29	0	0	43,510	113	0	0	0	14	0	0
DEC	17,202	51	0	0	410	38	0	0	34,527	146	0	0	0	19	0	0
TOTAL	288,415	639	0	0	123,674	470	0	0	651,717	1,814	0	0	34,460	239	0	0
	2.91%	2.27%	0.00%	0.00%	1.29%	1.71%	0.00%	0.00%	6.87%	6.70%	0.00%	0.00%	0.39%	0.94%	0.00%	0.00%
	288,415	639	0	0	412,088	1,109	0	0	1,063,805	2,923	0	0	1,098,266	3,162	0	0

Exhibit C – Performance Assurance
Tallahassee Community College

Table 4.6.8 Main Campus Chiller Plant Upgrade - Energy Reduction Equivalent Dollars

Tallahassee Community College
Main Campus CEP
Electric Consumption and Demand, Gas and Water
Guaranteed Values in Energy Dollars

Month	Chiller 1 Replacement - New Chiller				Cooling Tower Replacements / Upgrades				CEP Demand Flow				Chiller 5 Rebuild			
	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal
JAN	\$35,339	\$18,401	\$20,023	\$242	\$35,316	\$17,932	\$20,023	\$242	\$33,259	\$16,146	\$20,023	\$242	\$33,259	\$15,905	\$20,023	\$242
FEB	\$33,084	\$22,850	\$13,677	\$409	\$33,057	\$22,243	\$13,677	\$409	\$30,959	\$19,907	\$13,677	\$409	\$30,959	\$19,598	\$13,677	\$409
MAR	\$41,810	\$26,531	\$9,043	\$1,140	\$41,742	\$26,142	\$9,043	\$1,140	\$39,073	\$24,642	\$9,043	\$1,140	\$39,073	\$24,447	\$9,043	\$1,140
APR	\$44,060	\$28,668	\$5,740	\$1,629	\$43,934	\$28,279	\$5,740	\$1,629	\$41,051	\$26,779	\$5,740	\$1,629	\$41,028	\$26,585	\$5,740	\$1,629
MAY	\$57,408	\$38,565	\$4,941	\$2,986	\$57,051	\$38,176	\$4,941	\$2,986	\$53,472	\$36,699	\$4,941	\$2,986	\$53,245	\$36,504	\$4,941	\$2,986
JUN	\$59,955	\$34,000	\$4,736	\$3,807	\$58,288	\$33,347	\$4,736	\$3,807	\$53,775	\$30,828	\$4,736	\$3,807	\$53,343	\$30,496	\$4,736	\$3,807
JUL	\$66,965	\$34,381	\$4,894	\$4,331	\$64,573	\$33,649	\$4,894	\$4,331	\$59,253	\$30,809	\$4,894	\$4,331	\$58,640	\$30,431	\$4,894	\$4,331
AUG	\$62,905	\$34,207	\$4,894	\$4,001	\$61,109	\$33,543	\$4,894	\$4,001	\$56,321	\$30,956	\$4,894	\$4,001	\$55,844	\$30,612	\$4,894	\$4,001
SEP	\$58,366	\$39,404	\$4,736	\$3,367	\$57,641	\$38,946	\$4,736	\$3,367	\$53,916	\$37,171	\$4,736	\$3,367	\$53,627	\$36,942	\$4,736	\$3,367
OCT	\$44,333	\$30,728	\$6,111	\$1,742	\$44,189	\$30,350	\$6,111	\$1,742	\$41,401	\$28,873	\$6,111	\$1,742	\$41,393	\$28,678	\$6,111	\$1,742
NOV	\$38,644	\$23,946	\$9,881	\$1,107	\$38,572	\$23,580	\$9,881	\$1,107	\$35,961	\$22,149	\$9,881	\$1,107	\$35,961	\$21,966	\$9,881	\$1,107
DEC	\$33,805	\$18,645	\$21,697	\$282	\$33,780	\$18,164	\$21,697	\$282	\$31,709	\$16,310	\$21,697	\$282	\$31,709	\$16,069	\$21,697	\$282
TOTAL	\$576,673	\$350,326	\$110,374	\$25,042	\$569,252	\$344,350	\$110,374	\$25,042	\$530,149	\$321,269	\$110,374	\$25,042	\$528,082	\$318,235	\$110,374	\$25,042

Differences from above

Month	Chiller 1 Replacement - New Chiller				Cooling Tower Replacements / Upgrades				CEP Demand Flow				Chiller 5 Rebuild			
	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal
JAN	\$950	\$630	\$0	\$0	\$23	\$469	\$0	\$0	\$2,057	\$1,786	\$0	\$0	\$0	\$240	\$0	\$0
FEB	\$1,417	\$824	\$0	\$0	\$26	\$607	\$0	\$0	\$2,098	\$2,336	\$0	\$0	\$0	\$309	\$0	\$0
MAR	\$2,281	\$527	\$0	\$0	\$68	\$389	\$0	\$0	\$2,669	\$1,500	\$0	\$0	\$0	\$195	\$0	\$0
APR	\$1,802	\$527	\$0	\$0	\$126	\$389	\$0	\$0	\$2,883	\$1,500	\$0	\$0	\$23	\$195	\$0	\$0
MAY	\$773	\$527	\$0	\$0	\$357	\$389	\$0	\$0	\$3,580	\$1,477	\$0	\$0	\$227	\$195	\$0	\$0
JUN	\$1,500	\$882	\$0	\$0	\$1,667	\$653	\$0	\$0	\$4,513	\$2,519	\$0	\$0	\$431	\$332	\$0	\$0
JUL	\$1,107	\$996	\$0	\$0	\$2,392	\$733	\$0	\$0	\$5,320	\$2,839	\$0	\$0	\$612	\$378	\$0	\$0
AUG	\$1,547	\$916	\$0	\$0	\$1,796	\$664	\$0	\$0	\$4,787	\$2,587	\$0	\$0	\$477	\$343	\$0	\$0
SEP	\$971	\$630	\$0	\$0	\$724	\$458	\$0	\$0	\$3,725	\$1,775	\$0	\$0	\$289	\$229	\$0	\$0
OCT	\$1,982	\$515	\$0	\$0	\$145	\$378	\$0	\$0	\$2,788	\$1,477	\$0	\$0	\$8	\$195	\$0	\$0
NOV	\$1,943	\$504	\$0	\$0	\$72	\$366	\$0	\$0	\$2,611	\$1,431	\$0	\$0	\$0	\$183	\$0	\$0
DEC	\$1,032	\$653	\$0	\$0	\$25	\$481	\$0	\$0	\$2,072	\$1,855	\$0	\$0	\$0	\$240	\$0	\$0
TOTAL	\$17,305	\$8,129	\$0	\$0	\$7,420	\$5,976	\$0	\$0	\$39,103	\$23,081	\$0	\$0	\$2,068	\$3,034	\$0	\$0
	2.91%	2.27%	0.00%	0.00%	1.29%	1.71%	0.00%	0.00%	6.87%	6.70%	0.00%	0.00%	0.39%	0.94%	0.00%	0.00%
		\$25,434		\$25,434		\$13,397		\$13,397		\$62,184		\$62,184		\$5,102		\$5,102
	\$17,305	\$8,129	\$0	\$0	\$24,725	\$14,105	\$0	\$0	\$63,828	\$37,186	\$0	\$0	\$65,896	\$40,220	\$0	\$0
				\$25,434				\$38,830				\$101,015				\$106,116

Baseline Adjustments:

Changes in facility use due to new construction, extended or contracted operating schedules, occupancy, or changes in functionality will change energy consumption and require adjustments to the usage predicted by the pre-retrofit Baseline models. The Annual Performance Assurance Report will document changes in conditions that may affect Savings longevity.

Construction of new buildings that receive cooling water from the central plants will increase the energy consumption of the plants. Installation of metering equipment on these new buildings is required to record the cooling energy consumed by these new buildings. These meters must be trended in the energy management controls system and measurements made available to Siemens for analysis. The measured cooling loads will be added to the baseline consumption to account for the increased central plants energy consumption.

Weather related adjustments may be taken to properly account for the Main Campus CEP efficacy related to wet bulb influence on cooling tower performance. Chiller and cooling tower fouling and scaling could be considered for baseline adjustments to the predicted efficacy of the Main Campus CEP post retrofit.

Hourly Main Campus CEP data described in Section 4.6 for Demand Flow will be recorded for a one-year period after Acceptance to document chilled water plant performance and plant load. A statistical model of the data will be created to document the monthly post-retrofit cooling energy consumption. Increases in system loads in future years that are identified by comparing measured cooling water consumption to the post-retrofit consumption statistical model will be considered for baseline adjustments.

Measurement or Reference Tables:

The following measurements are required to implement the proposed savings calculation methodology. Siemens will ensure all proposed metering points are installed as needed.

Pre-retrofit measurements:

Chilled water production and electric energy consumption were measured for a sample of chiller systems to determine the overall chiller system efficiency (kW/ton). The following measurements were recorded:

- Chiller and plant power (kW) and energy (kWh), based on chiller and plant current (amperage) and kW trend data
- Secondary system chilled water flow (gpm)
- Secondary system chilled water supply and return temperatures (deg F)

Post-retrofit measurements:

The Siemens energy management controls system (EMCS) will be used to record chilled water production, and electric energy consumption values at hourly intervals during the post-retrofit measurement period. Total post-retrofit chiller system power (kW) will be summed in real time on the Siemens EMCS. This historical trend data will be visible to the EMCS operator in the Siemens EMCS. Total power measured will include chillers, chilled water pumps, condenser water pumps, and cooling tower fans. Total chiller system tons, ton-hours and kW/ton will also be calculated and will be visible to the

operator. Total system power and output will be trended at hourly intervals on the Siemens EMCS and summed to monthly values for calculating savings.

The following measurements will be recorded in the energy management controls system:

- Chiller power (kW) and energy (kWh)
- Chilled Water Pumps power (kW) and energy (kWh)
- Condenser Water Pumps power (kW) and energy (kWh)
- Cooling Tower Fans power (kW) and energy (kWh)
- Secondary chilled water flow (gpm)
- Secondary chilled water supply and return temperatures (deg F)
- Condenser water makeup and blow down (gallons per month)

Responsibilities of the Parties:

The Siemens energy management controls system (EMCS) will be used to control the operation of equipment associated with these FIMs. The Siemens EMCS programming will keep the central plant and building chilled water systems operating at near design conditions. It is imperative that these systems remain operating according to the logic programmed by Siemens. A reduction in Savings will result if equipment is placed in “HAND” or placed in “OPER” priority which bypasses the functions intended by Siemens.

It shall be the responsibility of the CLIENT to notify SIEMENS of any problems with the systems installed by SIEMENS and provide the necessary access to equipment and systems affected. SIEMENS shall then determine the best course of action to ensure building occupant comfort and how to maintain the Guaranteed Savings. Unintended changes in operation of systems associated with these FIMs by the CLIENT may require baseline adjustments.

Specifications for Measurement Tools:

Permanently installed meters and equipment will be installed and monitored using the Siemens EMCS during the post-retrofit measurement period.

Pre-retrofit measurements:

- Existing Johnson Controls EMCS temperature and flow meter sensors

Post-retrofit measurements:

- Chilled water temperatures – Pyromation R1T185L483 and T-441-385US(0-100)F
- Chilled water flows – Onicon F-3500 turbine insertion flow meter
- Chilled water differential pressure transducers – Sitans A6X30060297 and Veris PWLX-05S
- Electric kW meters - Siemens Digital Energy Monitor (DEM)
- Variable Frequency Drive (VFD) kW meters – BACnet communication
- Motor status current switches (for constant load circuits)

Article 5: Utility Baseline Data

5.1 Heating Hot Water Boilers Upgrade

The Heating Hot Water Boiler facility has a natural gas utility meter that was tested during the IGA development and is tested to be 99.6% accurate. The two existing boilers have had mechanical problems and have been operating intermittently in the recent years. As part of the development activity CLIENT commissioned Siemens to develop a building model to provide a corrected baseline utility consumption of the boilers. The details are in the Trace documentation “Monthly Energy Consumption.pdf” page 1. For accuracy and due to size of the data file they will not be repeated here. This Baseline Period’s Facility utility consumption in the Trane Trace attachment will not be used for comparing the Facility’s future utility consumption during the Performance Guarantee Period as Option C M&V was not selected by customer. The “Trace Therms” column in the table below indicates the M&V Option A baseline to be applied to this FIM. This modeled Baseline consumption will be used as the reference that future years utility usage in order to determine the Guaranteed Savings.

Table 5.1.1 - Main Campus Boiler Plant Upgrade Trace Model Baseline Data comparison to Main Campus Natural Gas Utility Bills

2015 Month	Bills Therms	Trace Therms	Diff Therms	Diff Percent	Cost Therms	Rate: \$/Therm \$ 0.70484
Jan	29,370	24,859	4,511	84.6%	\$ 17,521.34	
Feb	34,128	18,290	15,838	53.6%	\$ 12,891.48	
Mar	16,667	13,041	3,626	78.2%	\$ 9,191.60	
Apr	12,339	8,539	3,800	69.2%	\$ 6,018.28	
May	10,115	7,459	2,656	73.7%	\$ 5,257.63	
Jun	7,976	6,720	1,256	84.3%	\$ 4,736.53	
Jul	7,115	6,944	171	97.6%	\$ 4,894.41	
Aug	7,386	6,944	442	94.0%	\$ 4,894.41	
Sep	4,221	6,922	(2,701)	164.0%	\$ 4,879.08	
Oct	8,133	9,877	(1,744)	121.4%	\$ 6,961.92	
Nov	10,292	13,662	(3,370)	132.7%	\$ 9,629.60	
Dec	8,788	25,577	(16,789)	291.0%	\$ 18,027.69	
Totals:	156,530	148,834	7,696	95.1%	\$ 104,903.98	

The operating practices such as equipment hours of use, operating temperatures, equipment inventory for heat loads during the Baseline Period is shown in the Trane Trace model attachment. For accuracy and due to size of data file they will not be repeated here. The Guaranteed Savings provided under this Agreement are based on the new boiler efficiencies gained by implementing the Work.

5.2 Lighting Retrofit Project

The Main Campus Electric usage Baseline was established from the highest usage Main Campus electric utility meters. The table below indicates the electric meters Consumption and Demand used in the Main Campus Electric Baseline. Only one electric meter usage table is shown as it represents 93% of the Main Campus electric usage and establishes the electric Baseline for the Main Campus Lighting Retrofit FIM. This baseline is used with the Main Campus Lighting Sensors FIM as well.

Table 5.2.1 - Main Campus 2015 Electric Utility Baseline – All Meters

Facility Account	Rate Tariff	Annual kWh	Annual kW	% of Total
Main Campus	Electric Large Demand	10,191,600	26736	92.96%
#19-University Ctr.	General Service Demand	179,440	458	1.64%
Bldg. 43 AMTC(Advanced Manufacturing)	General Service Demand	158,208	605	1.44%
NW Annex, BLDG, 54, 55,56	General Service Non-Demand	97,600		0.89%
Bldg. # 20 Baseball Fieldhouse	General Service Demand	83,040	399	0.76%
Bldg. # 45 Specialty Contractor Bldg.	General Service Non-Demand	69,110		0.63%
Bldg. # 57-Mailroom	General Service Non-Demand	43,520		0.40%
Richardson Bldg.	General Service Non-Demand	27,460		0.25%
Ryder Bldg. -Combined	General Service Non-Demand	25,767		0.24%
32 Baseball Field Lights	General Service Demand	23,808	1867	0.22%
Bldg. # 36 Hankins Bldg.	General Service Non-Demand	16,586		0.15%
# 52, Superior Mech.	General Service Non-Demand	15,934		0.15%
Bldg. # 50-Orkin Bldg.	General Service Non-Demand	15,920		0.15%
Bldg. 33 Softbal Field house	General Service Demand	8,762	333	0.08%
NW Annex, BLDG, 54, 55,56 - Lighting	General Service Non-Demand	1,760		0.02%
SIGN # 2	General Service Non-Demand	1,557		0.01%
Bldg. # 46-Gorman - Lighting	Commercial Lighting	1,555		0.01%
#53-Artcraft Printer	General Service Non-Demand	1,360		0.01%
Bldg. # 58 Storage Bldg.	General Service Non-Demand	699		0.01%
SIGN # 1	General Service Non-Demand	148		0.00%
W. Tenn Sign (1)	General Service Non-Demand	7		0.00%
Richardson Building # A	General Service Non-Demand	0		0.00%
	Totals	10,963,841	30,398	

Table 5.2.2 - Main Campus 2015 Electric Utility Baseline – Main Campus Meter

Month	Energy (kWh)	Demand (kW)
Jan	693,600	1944
Feb	664,800	1704
Mar	808,800	1692
Apr	657,600	1944
May	810,000	1944
Jun	808,800	2340
Jul	1,028,400	2604
Aug	973,200	2664
Sep	1,101,600	2340
Oct	960,000	2544
Nov	787,200	2136
Dec	897,600	2388
Totals	10,191,600	26,244

The FPSI Campus Electric usage Baseline was established from FPSI Campus electric utility meters. The table below indicates the electric meters Consumption and Demand used in the FPSI Campus Electric Baseline. Six (6) electric meters usage are included in the Baseline and table shown they represents 92% of the FPSI Campus electric usage and establishes the electric Baseline for the FPSI Campus Lighting Retrofit FIM. This baseline is used with the FPSI Campus Lighting Sensors FIM as well

Table 5.2.3 - FPSI Campus 2015 Electric Utility Baseline – FPSI Campus All Meters

Facility Account	Rate Tariff	Account #	Meter #	Annual kWh	Annual kW	% of Total
444 Appleyard Dr ClassRm Admin	GSDLP	6938721104	16854330	766,080	2,076	26.09%
Academy Dr Dorm-Pat Thomas	GSDLP	6938729370	16854328	692,700	1,671	23.59%
444 Appleyard Dr Cafeteria	GSDLP	6937202320	16854329	510,120	1,776	17.38%
444 Appleyard Dr TCC Law	GSDLP	6938673420	16854330	291,960	540	9.94%
444 Appleyard Dr Police Dorm	GSDLP	6938673677	16854330	240,640	360	8.20%
75 College Dr Conf Ctr	GSDLP	1017541	16854328	201,888	511	6.88%
444 Appleyard Dr Pistol Range	GS-SP3 Rate	6938672570	16854254	146,880		5.00%
444 Appleyard Dr Ammun Storage	GS-CO	6937790407	32451330	59,769		2.04%
444 Appleyard Dr Tower	GS-PB	6938673040	27676978	14,686		0.50%
444 Appleyard Dr Skeet Range	GS-PB	6938674220	27676976	4,692		0.16%
444 Appleyard Dr Gate Operator	RS1	6938720130	27676964	3,413		0.12%
444 Appleyard Dr Pistol Range 2	GS-CO	6938720130	27676965	1,617		0.06%
444 Appleyard Dr Driver Range	RS1	6938672315	27676977	1,057		0.04%
444 Appleyard Dr WhtBrn	RS1	6938714463	27676975	164		0.01%
444 Appleyard Dr Const Trailer	RS1	1048874	28596186	140		0.00%
	All Total:	2,935,806	Base Total:	2,703,388	6,933	92%

Table 5.2.4 - FPSI Campus 2015 Electric Energy (kWh) Baseline Meters Data

Account Number	Jan	Feb	March	Apr	May	June	July	August	Sept	Oct	Nov	Dec	Totals:
6938721104	63,360	59,040	59,040	60,480	71,280	62,640	72,000	78,480	68,400	56,160	58,320	56,880	766,080
36937202213	45,900	51,300	45,300	52,800	65,400	65,100	72,900	77,100	71,100	54,300	56,400	35,100	692,700
36937202213	46,680	39,600	39,600	40,080	42,720	43,800	50,160	47,160	50,400	39,600	37,800	32,520	510,120
36938674774	21,720	21,840	16,320	16,800	22,080	25,680	31,560	37,080	32,640	23,760	22,440	20,040	291,960
36938716815	9,520	37,200	18,160	19,120	22,560	21,280	22,720	23,040	21,520	15,680	18,640	11,200	240,640
1018956	13,920	11,232	14,880	15,936	19,104	19,296	20,736	18,528	21,504	16,416	15,648	14,688	201,888
Totals:	201,100	220,212	193,300	205,216	243,144	237,796	270,076	281,388	265,564	205,916	209,248	170,428	2,703,388

Table 5.2.5 - FPSI Campus 2015 Electric Demand (kW) Baseline Meters Data

Account Number	Jan	Feb	March	Apr	May	June	July	August	Sept	Oct	Nov	Dec	Totals:
6938721104	226	215	134	143	210	176	203	184	163	131	124	166	2,076
36937202213	115	172	128	156	133	135	155	176	152	131	131	88	1,671
36937202213	164	156	147	154	151	151	159	158	146	140	121	128	1,776
36938674774	55	46	29	18	31	40	58	72	72	42	43	33	540
36938716815	33	47	29	29	30	33	35	32	25	24	33	11	360
1018956	36	13	39	42	57	53	56	37	51	47	42	38	511
Totals:	215,649	232,094	208,687	221,694	262,859	257,680	291,478	300,574	287,676	222,847	225,391	185,580	6,933

The Ghazvini Campus Electric usage Baseline was established from the single Ghazvini Campus electric utility meter. The table below indicates the electric meter Consumption and Demand used in the Ghazvini Campus Electric Baseline. One (1) electric meter usage is included in the Baseline and table shown they represents 100% of the Ghazvini Campus electric usage and establishes the electric Baseline for the Ghazvini Campus Lighting Retrofit FIM. This baseline is used with the Ghazvini Campus Lighting Sensors FIM as well

Table 5.2.6 - Ghazvini Campus 2015 Electric Utility Baseline Meter Data

Ghazvini Campus Electric Utility Baseline		
Account: 7377555798		
1528 Surgeons Dr		
Month	Energy (kWh)	Demand (kW)
Jan	56,160	194
Feb	64,800	230
Mar	72,720	187
Apr	75,600	180
May	77,040	252
Jun	89,280	281
Jul	92,160	295
Aug	94,320	266
Sep	90,720	281
Oct	80,640	245
Nov	79,920	238
Dec	64,080	202
Totals	937,440	2,851

5.3 Lighting Occupancy Sensors

The Lighting Sensors FIM is integrated into the Lighting Retrofit FIM and uses the same electric Baseline data as the Lighting Retrofit FIM Baseline date. To save document space the Baseline data will not be duplicated here. See the Lighting Retrofit FIM Baseline above for the Lighting Occupancy Sensor FIM Baseline data.

5.4 Domestic Water Upgrades

The Main Campus Domestic Water usage Baseline was established from Main Campus water utility meters. The table below indicates the water meters and consumption used in the Main Campus Water Baseline.

Table 5.4.1 - Main Campus 2015 Water Usage Baseline Data; 100x Gallons (cGals)

Account Number	Meter Number	Jan	Feb	March	Apr	May	June	July	August	Sept	Oct	Nov	Dec	Totals:
2455175610	W520180	2	42	15	1	3	2	3	4	2	3	3	6	86
2455175610	W816041	10	24	48	167	142	5	5	4	6	5	5	13	434
2455175610	W200741	118	59	56	20	27	20	20	25	30	35	50	64	524
2455175610	W509364	-	12	-	-	-	-	-	-	1	1	2	1	17
2455175610	WA04231	-	-	-	-	-	-	55	10	16	30	40	-	151
2455175610	W202189	48	118	170	115	56	33	63	95	103	55	155	94	1,105
2455175610	W201848	85	110	235	125	170	240	450	595	500	935	1,430	110	4,985
2455175610	W101180	4	4	184	62	5	84	9	-	-	-	1	2	355
2455175610	W902006	20	70	85	70	55	35	20	30	20	40	55	105	605
2455175610	W522399	200	213	244	260	145	5	4	7	10	19	27	150	1,284
2455175610	WA02639	6	25	22	13	15	14	21	12	21	16	22	43	230
2455175610	WA04426	155	172	352	239	324	202	142	149	75	600	1,707	361	4,478
2455175610	W202177	2,670	2,670	4,210	3,600	4,370	4,315	3,885	3,890	3,675	3,485	4,380	3,750	44,900
2455175610	WA04425	196	1,218	249	121	131	196	195	221	208	296	458	589	4,078
2455175610	WA05794	55	144	171	123	168	99	112	129	106	179	210	146	1,642
2455175610	W201317	269	300	220	188	235	258	227	221	243	221	213	306	2,901
2455175610	W201838	125	305	360	265	315	165	185	937	468	1,020	1,530	255	5,930
2455175610	WA04501	481	834	854	752	499	447	433	363	646	725	644	578	7,256
2455175610	W201775	50	120	155	130	130	90	85	100	120	150	150	100	1,380
2455175610	W201275	2,670	430	400	350	375	295	320	585	360	540	665	4,415	11,405
	Totals:	7,164	6,870	8,030	6,601	7,165	6,505	6,234	7,377	6,610	8,355	11,747	11,088	93,746

The FPSI Campus Domestic Water usage Baseline was established from FPSI Campus water utility meters. The table below indicates the water meters and consumption used in the Main Campus Water Baseline.

Table 5.4.2 - FPSI Campus 2015 Water Usage Baseline Data; 100x Gallons (cGals)

Account Number	Meter Number	Jan	Feb	March	Apr	May	June	July	August	Sept	Oct	Nov	Dec	Totals:
36938720742	16063918691	1,920	490	2,420	4,490	4,650	4,300	2,240	2,650	3,910	2,990	3,340	2,630	36,030
36937202213	15011345	339	271	332	538	531	561	319	337	501	312	467	375	4,884
36937202213	86005011345	340	70	140	210	250	160	160	160	510	130	210	170	2,510
36938674774	16000138808	376	281	222	366	310	320	210	212	372	430	682	106	3,887
36938716815	16000138744	54	733	45	101	92	131	237	94	85	66	78	133	1,849
1018956	8183976	15	15	1,018	24	38	47	28	14	21	16	134	38	1,408
	Totals:	184,259	277,363	350,158	237,138	228,063	241,711	181,572	157,259	231,790	192,935	309,775	164,140	50,568

5.5 Demand Flow®: Chiller Plant Optimization

Table 5.5.1 below shows the Main Campus baseline utility energy usage and the calibrated energy model baseline. Table 5.5.2 below shows the Main Campus baseline data for the central energy plant. This data was determined using the Johnson Controls System trend data, Main Campus utility data and energy modeling. The system trends, utility data and campus building data were applied to create a calibrated baseline of the chiller plant energy usage and efficiency in Trane Trace 6.3 building energy simulation application.

Table 5.5.1 - Main Campus Baseline Utility and Calibrated Baseline Model Data

Month 2015	Baseline - Actual				Base Calibrated Trace Model			
	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal
JAN	664,800	1,704	29,370	206	604,809	1,496	28,410	132
FEB	808,800	1,692	34,128	265	575,015	1,861	19,406	223
MAR	657,600	1,944	16,667	335	734,836	2,127	12,831	622
APR	810,000	2,436	12,339	518	764,368	2,295	8,144	889
MAY	808,800	2,340	10,115	668	969,682	3,073	7,011	1,630
JUN	1,028,400	2,679	7,976	859	1,024,254	2,742	6,720	2,078
JUL	973,200	2,664	7,115	910	1,134,527	2,781	6,944	2,364
AUG	1,101,600	2,340	7,386	932	1,074,205	2,761	6,944	2,184
SEP	960,000	2,544	4,221	939	988,952	3,147	6,720	1,838
OCT	787,200	2,136	8,133	718	771,916	2,456	8,670	951
NOV	897,600	2,388	10,292	512	676,449	1,922	14,019	604
DEC	618,000	1,812	8,788	318	580,617	1,517	30,785	154
TOTAL	10,116,000	26,679	156,530	7,178	9,899,630	28,178	156,604	13,669

Differences from above

Month	Baseline - Actual				Base Calibrated Trace Model			
	kWh	kW	Therms	CEP kGal	kWh	kW	Therms	CEP kGal
JAN					59,991	208	960	74
FEB					233,785	(169)	14,722	42
MAR					(77,236)	(183)	3,836	(288)
APR					45,632	141	4,195	(372)
MAY					(160,882)	(733)	3,104	(962)
JUN					4,146	(63)	1,256	(1,220)
JUL					(161,327)	(117)	171	(1,454)
AUG					27,395	(421)	442	(1,252)
SEP					(28,952)	(603)	(2,499)	(899)
OCT					15,284	(320)	(537)	(233)
NOV					221,151	466	(3,727)	(92)
DEC					37,383	295	(21,997)	164
TOTAL	0	0	0	0	216,370	(1,499)	(74)	(6,491)
					2.14%	-5.62%	-0.05%	-90.44%

Table 5.5.2 - Main Campus Chiller Plant Baseline Energy and Efficiency

Month	OADBT	OAWBT	Plant Load	Total CEP	Average	Peak Tons	Peak Tons	Demand
	deg F	deg F	Ton-Hrs	kWh	kW/Ton	Tons	kW/Ton	kW
JANUARY	50	46	42,291	75,334	1.781	167	2.229	373
FEBRUARY	55	49	72,718	96,205	1.323	318	1.655	527
MARCH	62	56	211,859	189,498	0.894	419	1.119	469
APRIL	67	59	308,711	243,478	0.789	631	0.987	622
MAY	73	67	574,080	414,758	0.722	1,135	0.904	1,026
JUNE	79	74	727,772	576,884	0.793	1,486	0.992	1,474
JULY	81	76	826,647	666,470	0.806	1,634	1.009	1,648
AUGUST	80	74	765,259	607,994	0.794	1,513	0.994	1,503
SEPTEMBER	76	70	646,741	479,752	0.742	1,321	0.928	1,226
OCTOBER	66	60	331,076	254,713	0.769	654	0.963	630
NOVEMBER	62	57	206,587	182,549	0.884	422	1.106	466
DECEMBER	51	47	49,755	79,963	1.607	197	2.011	395
Total / Average	67	61	4,763,495	3,867,600	0.812	1,634	1.016	10,359

5.6 Operating Practices

The operating practices such as equipment hours of use, operating temperatures, equipment inventory for heat loads during the Baseline Period is shown in the Trane Trace model attachment. For accuracy and due to size of data file they will not be repeated here. The Guaranteed Savings provided under this Agreement are based on the efficiencies gained by implementing the Work.

5.7 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 for work being performed unless specifically outlined to the contrary below. Unless specifically set forth in the Scope of Work and Services, Exhibit A, nothing herein should be construed as to require SIEMENS to provide additional work or services in the event that the current applicable code or regulation is modified.

Article 6: Utility Rate Structures and Escalation Rates

6.1 Utility costs used for Savings calculations will be based on the utility rates and rate escalation percentages provided in the tables below. The rates identified below are a stipulated rate based on the combined rates of the multiple utility meters at each campus. The applied rate is shown below for each FIM and applicable utility. An escalation rate of 3% will be applied for each utility per Annual Period.

Table 6.1.1 – Utility Rates Applied to FIM and Campus

FIM	Facility	Electric Consumption \$/kWh	Electric Demand \$/kW	Natural Gas \$/Therm	Water and Sewer \$/kGal
Boiler Plant Upgrade	Main Campus	–	–	\$0.704840	–
Chiller Plant Retrofit	Main Campus	\$0.06002	\$12.72106	–	–
Lighting Retrofit	Main Campus	\$0.06002	\$12.72106	–	–
Lighting Retrofit	Ghazvini Campus	\$0.06060	\$12.72426	–	–
Lighting Retrofit	FPSI No Dorm Bldgs	\$0.07848	\$7.49881	–	–
Lighting Retrofit	FPSI Dorms Bldgs	\$0.07848	\$7.49108	–	–
Water Upgrades	Main Campus	\$0.06686	–	–	\$7.9682
Water Upgrades	FPSI No Dorm Bldgs	\$0.07854	–	–	\$7.2340
Water Upgrades	FPSI Dorms Bldgs	\$0.07850	–	–	\$7.2343

Article 7: Contracted Baseline Conditions

7.1 The following tables detail the assumed Facility operating parameters that are applied to the FIM calculations. All of the FIM's of this project are using M&V Option A and as such Baseline adjustments due to changes to these facilities parameters are minimized. This specific configuration of Facility operating parameters is the Contracted Baseline.

For the Boiler replacement FIM Trane Trace energy modeling was applied and calibrated to the existing gas usage and take into account campus type, square footage, occupancy schedules, space temperature setpoints and existing boiler type and efficiencies. The Main Campus has typical college class weekday schedules extending into the evening until 10pm with Saturday classes occupying several building classrooms until noon. The Main Campus boiler plant supplies space heating to a total of 870,455 square feet of conditioned space. The two existing boilers are non condensing fire tube natural gas hot water space heating boilers. The Cleaver Brooks and Hurst boiler efficiencies were tested and determined to be 75% efficient. The customer has agreed that the 75% efficiency would be reasonable for the existing boilers at the typical operating loop temperature of 180F supply and 140F return.

Table 7.1.1 Summer/Winter Operating Hours

Day of Week	Occupied Run Hours	Unoccupied Run Hours		
Monday	7AM – 10PM	11PM-6AM		
Tuesday	7AM – 10PM	11PM-6AM		
Wednesday	7AM – 10PM	11PM-6AM		
Thursday	7AM – 10PM	11PM-6AM		
Friday	7AM – 10PM	11PM-6AM		
Saturday	8AM – 12 PM	1PM – 7AM		
Sunday	Closed	Closed		
Holiday	Closed	Closed		

Note: Facilities operating hours are indicative of typical higher education facilities occupancy schedules. All cooling and heating equipment in the facilities is available to operate 24/7 due to laboratory / dehumidification use during unoccupied hours as shown on Table 7.1.3.

Table 7.1.2 Summer/Winter Operating Temperatures

Day of Week	Occupied Minimum DEG	Occupied Maximum DEG	Unoccupied Minimum DEG	Unoccupied Maximum DEG
Monday	72	74	72	74
Tuesday	72	74	72	74
Wednesday	72	74	72	74
Thursday	72	74	72	74
Friday	72	74	72	74
Saturday	72	74	72	74
Sunday	72	74	72	74
Holiday	72	74	72	74

Table 7.1.3 Boiler Manufacture and Capacity

Equipment	Make	Model Number	Nominal Capacity	Age
Boiler – 1	Hurst	125	12.0 MMBtu/hr	23 Years
Boiler – 2	Cleaver Brooks	CB-209-300	12.5 MMBtu/hr	38 Years

Table 7.1.4 Boiler Pump Horse Power

Pumps	Size
HWPP-1	20hp
HWPP-2	20hp
HWSP-1	75hp
HWSP-2	75hp



Certificate of Substantial Completion

PROJECT NAME:	
CLIENT:	
CERTIFICATE DATE (mm/dd/yyyy):	
CERTIFICATE NUMBER:	
PROJECT NUMBER:	

The following portions of the Work are at Substantial Completion in accordance with the Agreement. (Insert unique Work Item such as Facility Improvement Measure title, system name, building, etc.)

Work Item:	
Warranty Start Date (mm/dd/yyyy):	
Work Item:	
Warranty Start Date (mm/dd/yyyy):	
Work Item:	
Warranty Start Date (mm/dd/yyyy):	

The Building Technologies Division of Siemens Industry, Inc. guarantees the workmanship and materials of the above Substantially Complete Work in accordance with the Agreement.

The Work indicated above has been reviewed by the CLIENT and has been found, to the best of the CLIENT’s knowledge, to be Substantially Complete. Substantial Completion is the milestone in the progress of the Work at which time the Work is sufficiently complete and available for the CLIENT to have beneficial use of the Work for its intended purpose. A list of items to be completed and corrected (if any) shall be identified as the Outstanding Items List, attached to this form, and indicated by checking the appropriate box below:

Outstanding Items List Attached: **No Outstanding Items Noted:**

The failure of the CLIENT to note items requiring completion or correction does not relieve the contractual responsibility of Building Technologies Division of Siemens Industry, Inc. to complete or correct the Work. Work found to require completion or correction after the Certificate Date of this

Certificate, but within the warranty period shall be corrected in accordance with the Contract warranty Terms and Conditions.

Building Technologies Division of Siemens Industry, Inc. agrees to complete or correct all items indicated on the Outstanding Items in a timely manner.

Building Technologies Division of Siemens Industry, Inc. Representative: _____

Signature: _____ Date: _____

The CLIENT accepts the Work indicated above as Substantially Complete and assumes possession and beneficial use of the Work on the Warranty Start Date indicated above.

CLIENT: _____

CLIENT Representative: _____

Signature: _____ Date: _____

Note: The CLIENT shall, upon execution of this Certificate of Substantial Completion, assume all contractual responsibilities for maintenance, insurance, operation, and protection of the Substantially Complete Work in accordance with the Contract Terms and Conditions.



Certificate of Final Completion

PROJECT NAME:	
CLIENT:	
CERTIFICATE DATE (mm/dd/yyyy):	
PROJECT NUMBER:	

All elements of the project Work have been reviewed by the CLIENT and have been found, to the best of the CLIENT’s knowledge, to be at Final Completion. All items noted in the Outstanding Items Lists associated with Certificate(s) of Substantial Completion have been resolved, and all Work as defined in Exhibit A of the Agreement is complete.

The failure of the Owner to note items requiring completion or correction does not relieve the contractual responsibility of Building Technologies Division of Siemens Industry, Inc. to complete or correct the Work. Work found to require completion or correction after the date of this Certificate, but within the warranty period shall be promptly corrected in accordance with the Agreement.

Building Technologies Division of Siemens Industry, Inc. has reviewed the project Work, as well as all contractual requirements, and the requirements for Final Completion have been met.

Building Technologies Division of Siemens Industry, Inc. Representative: _____

Signature: _____ Date: _____

The CLIENT accepts the project Work as meeting the requirements for Final Completion.

CLIENT: _____

CLIENT Representative: _____

Signature: _____ Date: _____

Direct Purchase Procedure

Pursuant to and consistent with Section 212.08(6) of the Florida Statutes and the Fla. Admin. Code Ann. R. 12A-1.094 and 12A-1.038, the Parties agree to the following procedure regarding CLIENT's direct-purchase from vendors of certain equipment to be used in the Project:

1. In accordance with the project schedule, SIEMENS shall submit to CLIENT a list of all potential direct-purchase equipment, including vendor name, address, telephone number, fax number, and the value of the equipment.
2. In accordance with the project schedule, SIEMENS shall prepare and submit a worksheet for each vendor ("Vendor Worksheet") so that CLIENT can direct purchase equipment and materials. The Vendor Worksheet will include: the vendor's name, address, telephone number, fax number, sales person contact, delivery method, expected delivery date, item numbers, descriptions, quantities, unit prices, line item extended prices, order total.
3. CLIENT will prepare and issue a Purchase Order to the vendor and attach the Vendor Worksheet submitted by SIEMENS with a copy of CLIENT's State of Florida sales tax exemption certificate.
4. SIEMENS will inspect the materials purchased by CLIENT upon delivery to the Facility for product specifications, quantities, and safe storage. SIEMENS will notify CLIENT promptly of any damage and/or discrepancies or problems with the delivered order, but SIEMENS shall not be responsible for any damage and/or discrepancies discovered thereafter.
5. Title to the direct purchased materials will vest in CLIENT at the time the materials are delivered and accepted by CLIENT at CLIENT's project site.
6. CLIENT assumes all risk of damage or loss for the items purchased from the time of delivery and acceptance to the time of incorporation into the Facility. CLIENT will bear the costs of Payment and Performance Bonds and Builder's Risk Insurance on the items purchased, as well as the economic benefit of any proceeds in the event of a claim.
7. CLIENT is to be invoiced directly by the vendor for direct purchased materials.
8. CLIENT will forward invoices to SIEMENS for review. SIEMENS will return the invoices to CLIENT with any relevant notations and/or supporting documentation (e.g. packing lists, freight carrier's bill of lading, incident report, etc.), if any.
9. CLIENT will be liable for the payment of all vendor invoices. Payments of invoices are to be made by CLIENT directly to the vendor.
10. SIEMENS shall maintain copies of all transactions carried out under this Direct Purchase Procedure.

11. SIEMENS will assist CLIENT in obtaining favorable pricing from vendors when possible.

12. CLIENT acknowledges and agrees that, should it elect to directly purchase any tangible personal property/building material for the project, it will pay any taxes ultimately determined to be due, and any associated interest, penalties or other direct costs incurred on said direct purchase items as a result of any audit, examination, investigation, and/or determination by the Florida Department of Revenue, or other such department/agency having jurisdiction, arising out of the election of CLIENT to directly purchase any item whereby sales tax exemption is disallowed or challenged, provided however, said taxes are not the result of a failure by SIEMENS to fulfill its obligations under these Direct Purchase Procedure. Nothing contained herein shall prevent CLIENT from contesting in good faith in any proper proceedings the validity of any such taxes, penalty or interest, or other asserted direct costs by any such agency.

13. The Price identified in Article 1 of Exhibit B is the fee is due and payable to SIEMENS in accordance with Article 8 of the Agreement and is irrespective of any equipment direct-purchased by CLIENT. In the event CLIENT does not direct-purchase equipment and requests Siemens purchase equipment on CLIENT's behalf, the parties will execute a mutually agreeable change order pursuant to Article 7 of the Agreement.

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

CLIENT:

Signature: _____
Printed Name: _____
Title: _____
Date: _____

SIEMENS:

Signature: _____
Printed Name: _____
Title: _____
Date: _____