TOWN OF GLASTONBURY
PROCUREMENT NOTICE
REQUEST FOR PROPOSAL
DIRECT DIGITAL CONTROL SERVICES
RPGL-2013- 36

The Town of Glastonbury will be accepting proposals from qualified individuals or firms to provide direct digital control services to perform retro commissioning (RCx) measures and also ongoing on call services for the Town of Glastonbury, 2155 Main St, Glastonbury, CT Proposals shall provide technical data for components to be provided, pricing proposals, and other data necessary in order to determine the best value.

There will be a PRE-PROPOSAL MEETING held at Glastonbury Academy Building 2143 Main St, Glastonbury on May 16, 2013 at 1:00 p.m.

Proposals must be submitted to the Purchasing Agent no later than **May 28, 2013 at 11:00 a.m.**

LATE PROPOSALS WILL NOT BE CONSIDERED. COPIES OF THE PROPOSAL ARE AVAILABLE ON THE TOWN'S WEBSITE AT www.glastonbury-ct.gov.

Mary F. Visone
Purchasing Agent

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SECTION I – GENERAL INFORMATION

Background – The Town of Glastonbury in conjunction with SBS LLC and CLP/CNG have developed measures as part of a retro commissioning project. The work associated with these measures is varied and described in the attachments. Additionally rates will be established for on call direct digital control services for Town and Board of Education systems. The systems involved in this work are mostly Alerton Control Systems of varying ages. The Town buildings were last upgraded in 2010.

General Intent - It is the general intent to execute measures developed during the retro commissioning process by SBS LLC. The measures include upgrades to some of the equipment and optimization of control schemes. Work will include programming, installations, training, measurement and verification and project close out for the retro commissioning investigation work. Also included is general system repair, design and installation and improvements for Town and Board of Education control systems.

Existing Facility – Scope descriptions for retro commissioning schemes are included in Attachment A.

SECTION II – CONSIDERATIONS AND RESTRICTIONS

- The successful respondent shall ensure the system will comply with all applicable codes. The buildings will be available for work immediately however, work schedules and locations will need to be coordinated on a daily basis with the Facilities Department. Hours available for work will be from 7:00 AM to 3:30 PM, Monday through Friday, holidays excepted. Work on weekends and evenings may be scheduled, as necessary.

- The proposed work shall take into account schedule and follow through as described by the CLP Retro commissioning (RCx) process as well as cost and ability to service all systems of the Town and Board of Education.

- Vendors will propose on the work to satisfy the Town's requirement. If any alternate schemes are proposed, then the alternative proposed the following information shall be provided, at a minimum:

    - Price to perform the work.
    - Technical data for each of the components proposed for installation including layout, configuration, make, model, size, and quantities of components to be provided, enclosures if necessary and any other data necessary to evaluate the applicability of the system and associated performance.
    - Complete scope of work included in the proposal and any work not included in the proposal but required to make the system fully functional.
    - A schedule indicating major milestones for installation of the system if required, removal of existing components, operational testing, and operations and maintenance training of Town staff.
    - Warranties available for proposed system and availability of extended warranties
    - Any premium costs associated with system outside of original installation costs
    - Names and phone numbers of references for similar work performed on facilities in Connecticut

- All drawings, reports, data, and other documents prepared by the Vendor according to this Agreement shall be submitted to the Town for its review and approval. Resulting work products of the Vendor pursuant to this solicitation shall become property of the Town of Glastonbury.

- No such approval shall in any way be construed to relieve the Vendor of responsibility for technical adequacy or operate as a waiver of any of the Town's rights under this Agreement. The Vendor shall remain liable to the Town according to applicable laws and practices for all damages to the Town caused by the Vendor's negligent performance of any of the services furnished under this Agreement.

- If necessary, the Vendor shall conduct regular meetings with the Town, and other appropriate parties, at a location established by the Town to review progress. The Vendor will provide written notes of each meeting to all attending parties before the next meeting.

- Consideration will be given to the type of system proposed, the associated cost, the yearly maintenance costs and the time required to provide and install the units.

- System proposed shall also be able to be serviced by a third party vendor without any proprietary restrictions unless previously identified by proposer.

- **The Town shall not be obligated to accept any proposal and the Town shall reserve the sole right to determine the appropriateness of any proposal for this work.**

SECTION III - SUBMISSION OF PROPOSAL

MINIMUM REQUIREMENTS

- Vendor shall be licensed by the State of Connecticut to perform the work required and involved.

- Vendor shall have an assigned project manager to oversee this work and act as liaison to the Town.

- Vendor shall demonstrate sufficient staff resources to perform the work.

- Vendor shall have demonstrated experience designing and installing similar systems in facilities within the past five (5) years.

TERM OF SERVICE

The selected firm will be expected to commence services within 5 days of contract execution or on such other schedule as may be agreed to with the Town. The Town anticipates allocating up to 1 week of overall time for the project described herein including data collection, meetings, consultant preparation, etc. The Town of Glastonbury reserves the right to cancel this proposal process at any time should any of the following conditions exist:

- Funds are not appropriated to allow continuance of this contract.

- The Town, through changes in its requirements or method of operation, no longer has a need for this service.

- The Town is not satisfied with the level of services provided under the contract or the contractor fails to comply with any of the terms and conditions outlined in the contract.

SITE INSPECTION

A **site inspection** is scheduled for **May 16th at 1:00 pm** at 2143 Main St, Glastonbury, CT 06033.

PROPOSAL INSTRUCTIONS

- By submitting a proposal, you represent that you have thoroughly examined and become familiar with the Scope of Services outlined in this RFP and you are capable of performing the work to achieve the Town's objectives.

- All firms are required to submit a **clearly marked** original and seven (7) copies of their proposal to Mary F. Visone, Purchasing Agent, 2155 Main Street, Glastonbury, CT by the date and time listed in the proposal response page. All proposals will be opened publicly and recorded as received. Respondents may be present at the opening; however, there will be no public reading of Proposals. Proposals received later than the time and date specified will not be considered. The proposal must be submitted in a sealed envelope or package and the outside shall be clearly marked as follows:

  SEALED REQUEST FOR PROPOSAL
  PROCUREMENT NOTICE
  DIRECT DIGITAL CONTROL SERVICES
  RPGL-2013-36
  May 28, 2013
  11:00 AM

- All respondents are required to submit the information detailed below. **Responses shall be organized and presented in the order listed below to assist the Town in reviewing and rating proposals.** Responses should be presented in appropriate detail to thoroughly respond to the requirements and expected services described herein.

  1. Table of Contents, to include clear identification of the material provided by section and number.

  2. A letter of transmittal indicating the firm's interest in providing the service and any other information that would assist the Town in making a selection. This letter must be signed by a person legally authorized to bind the firm to a contract.

  3. Name and telephone number of person(s) to be contacted for further information or clarification.

4. Copy of State of Connecticut license to perform the work if required.

5. Name and qualifications of assigned project manager and a list of staff members who would be involved with the project, including their assigned roles and a description of their background and experience.

6. A background statement including a description of relevant experience of the firm/individual submitting the proposal.

7. For each alternative proposed the following information:

    a. Price to perform the work.
    b. Technical data for each of the system(s) and components proposed for installation including layout, configuration, make, model, network requirements, size, and quantities of components to be provided, and any other data necessary to evaluate the applicability of the system.
    c. Complete scope of work included in the proposal and any work not included in the proposal but required to make the units fully functional.
    d. A schedule indicating major milestones for installation of new system, removal of existing components, operational testing, and operations and maintenance training of Town staff.
    e. Warranties provided.
    f. Any premium costs associated with work outside of normal work hours that is not included in the basic price proposal.
    g. Names and phone numbers of references for similar work performed.

8. Respondent shall provide a list of 3-5 references and examples of previous similar projects successfully completed within the last five years with the contact name, address and telephone number of the owners' representative in each project.

9. A concluding statement as to why the respondent is best qualified to meet the needs of the Town.

10. Proposal Response Form (**ATTACHMENT B**).

11. Description of any exceptions taken to this RFP. If any proposal involves any exception from the stated requirements and specifications, they must be clearly noted as exceptions and attached to the proposal.

12. Respondent is required to review the Town of Glastonbury Code of Ethics adopted July 8, 2003 and effective August 1, 2003. Respondent shall acknowledge that they have reviewed the document in the area provided on the attached Ethics Acknowledgement form included on **ATTACHMENT B.** The selected respondent will also be required to complete and sign a Consultant Acknowledgement Form prior to award. The Code of Ethics and the Consultant Acknowledgment Form can be accessed at the Town of Glastonbury website at www.glastonbury-ct.gov. Upon entering the website click on "Business," then "Doing Business with the Town," then "Bids and Quotes" which will bring you to the links for the Code of Ethics and the Consultant Acknowledgement Form. If the respondent does not have access to the internet, a copy of these documents can be obtained through the Purchasing Department at the address listed within this proposal.

13. Statement of Non-Collusion (**ATTACHMENT C**).

14. **Non Resident Contractors (IF APPLICABLE)**

    The Town is required to report names of nonresident (out of state) Contractors to the State of Connecticut, Department of Revenue Services (DRS) to ensure that Employment Taxes and other applicable taxes are being paid by Contractors. **Upon award, all nonresident contractors must furnish a five percent (5%) sales tax guarantee bond (state form AU-766), or a cash bond for 5% of the total contract price (state form AU-72) to DRS even though this project is exempt from most sales and use taxes.**

    See State Notice to Nonresident Contractors SN 2005(12). If the above bond is not provided the Town is required to withhold 5% from Contractor's payments and forward it to the State DRS.

    Contractor must promptly furnish to the Town a copy of the **Certificate of Compliance** issued by the State DRS.

15. Any technical questions regarding this RFP shall be made in writing and directed to Mr. David Sacchitella, Building Superintendent, at (860) 652-7706 or via e-mail at Dave.Sacchitella@glastonbury-ct.gov. Administrative questions should be directed to Mary F. Visone, Purchasing Agent at (860) 652-7588. All questions, answers, and/or addenda, as applicable, will be posted on the Town's website at www.glastonbury-ct.gov (Upon entering the website click on Bids & RFPs). **It is the respondent's responsibility to check the website for addenda prior to submission of any proposal.**

    Note: Responses to requests for more specific contract information than is contained in the RFP shall be limited to information that is available to all offerors and that is necessary to complete this process. The request must be received at least five (5) business days prior to the advertised response deadline.

16. The Town of Glastonbury is dedicated to waste reduction and the practice of using and promoting the use of recycled and environmentally preferable products. Respondents are encouraged to submit RFP responses that are printed double-sided (except for the signed proposal page) on recycled paper, and to use paper dividers to organize the RFP for review. All proposal pages should be secured with a binder clip, staple or elastic band, and shall not be submitted in plastic binders or covers, nor shall the proposal contain any plastic inserts or pages. We appreciate your efforts towards a greener environment.

- Failure to include any of the above-referenced items in the submitted PROPOSAL may be grounds for disqualifying said proposal.

EVALUATION CRITERIA

- The Town of Glastonbury shall select the responsible and responsive Proposal which is determined by the Town to be the best suited, most advantageous, and provides the best value to the Town on the basis of the criteria included in this Request for Proposal. The Town expressly reserves the right to negotiate with the selected Proposer prior to an award of any contract pursuant to this RFP. Best value shall be determined by consideration of some or all of the following factors as deemed appropriate by the Town.

    - The qualifications and experience of the vendor and its designated account representative. Successful performance of similar work on other accounts.

    - Completeness of the proposal and adequacy of the information provided.

    - Technical Solution/Approach to Project: Types, capabilities, efficiency, applicability, ease of operation and maintenance, warranties, etc. of system and components proposed.

    - Schedule.

    - Total Cost/Overall Value: Initial price to provide and install and incentives and rebates available and confirmed.

    - The number, scope, and significance of conditions or exceptions attached or contained in the proposal.

SELECTION PROCESS

- This request for proposals does not commit the Town of Glastonbury to award a contract or to pay any costs incurred in the preparation of a proposal to this request. All proposals submitted in response to this request become the property of the Town of Glastonbury. The Town of Glastonbury reserves the right to accept or reject any or all proposals received as a result of this request, to negotiate with the selected respondents, the right to extend the contract for an additional services, or to cancel in part or in its entirety the request for proposals, if it is in the best interests of the Town to do so.

- An Evaluation Committee, appointed by the Town Manager, will evaluate all proposals received for completeness and the respondent's ability to meet all requirements as outlined in this RFP.

- Following review and evaluation of proposals, the Town reserves the right to request certain additional information. Based on review and rating of proposals, if determined to be necessary, a short list of respondents may be invited to interview with the Town Selection Committee.

- Additional technical and/or cost information may be requested from any respondent by the evaluation committee prior to, during, or after the interview for clarification purposes, but in no way changes the original proposal submitted. Interviews are at the option of the evaluation committee and may or may not be conducted.

- Based on the results of the interview process, the Town will review the Scope of Services, proposed price, and other factors with the top-rated firm(s) and negotiate a specific agreement based on these discussions.

- The selected respondent will be issued a purchase order to perform the work.

TIMELINE

The Town intends to adhere to the schedule listed below as closely as possible, but reserves the right to modify the schedule in the best interest of the Town as required.

Publicize RFP	**May 9, 2013**
Mandatory Pre-proposal Meeting	**May 16 at 1:00 p,m.**
RFP Due Date	**May 28, 2013 at 11:00 a.m.**
Shortlist of Submittals Received	**TBD, if necessary**
Interviews with Top Respondents	**TBD, if necessary**
Contract Effective Date	**TBD**

INSURANCE

The Bidder shall, at its own expense and cost, obtain and keep in force during the entire duration of the Project or Work the following insurance coverage covering the Bidder and all of its agents, employees and sub-contractors and other providers of services and shall name the **Town and its employees and agents as an Additional Insured** on a primary and non-contributory basis to the Bidders Commercial General Liability and Automobile Liability policies. **These requirements shall be clearly stated in the remarks section on the Bidders Certificate of Insurance.** Insurance shall be written with Carriers approved in the State of Connecticut and with a minimum Best's Rating of A-. In addition, all Carriers are subject to approval by the Town. Minimum Limits and requirements are stated below:

1) Worker's Compensation Insurance:

- Statutory Coverage
- Employer's Liability
- $100,000 each accident/$500,000 disease-policy limit/$100,000 disease each employee

2) Commercial General Liability:

- Including Premises & Operations, Products and Completed Operations, Personal and Advertising Injury, Contractual Liability and Independent Contractors.

- Limits of Liability for Bodily Injury and Property Damage
  Each Occurrence $1,000,000
  Aggregate $2,000,000 (The Aggregate Limit shall apply separately to each job.)
- A Waiver of Subrogation shall be provided

3) Automobile Insurance:

- Including all owned, hired, borrowed and non-owned vehicles
- Limit of Liability for Bodily Injury and Property Damage:
  Per Accident $1,000,000

4) Professional Liability:

- Limit of Liability: $1,000,000

5) Umbrella Liability:

- Limit of Liability: $2,000,000 Per Occurrence & Annual Aggregate

Coverage is to apply in excess of all primary insurance policies, coverages, and limits specified above

The Bidder shall direct its Insurer to provide a Certificate of Insurance to the Town before any work is performed. It is the responsibility of the Contractor to notify the Town 30 days in advance of notice of cancellation or non-renewal. The Certificate shall evidence all required coverage including the Additional Insured and Waiver of Subrogation. The Bidder shall provide the Town copies of any such policies upon request.

INDEMNIFICATION

To the fullest extent permitted by law, the Bidder shall indemnify and hold harmless the Town and its consultants, agents, and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, attorneys and other professionals and court and arbitration costs) arising out of or resulting from the performance of the Bidder's work, provided that such claim, damage, loss or expense is caused in whole or in part by any negligent act or omission by the Bidder, or breach of its obligations herein or by any person or organization directly or indirectly employed or engaged by the Bidder to perform or furnish either of the services, or anyone for whose acts the Bidder may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

The above insurance requirements are the Town's general requirements. Insurance requirements with the awarded respondent are subject to final negotiations.

ATTACHMENT A

See attached plans/data:

- **Copies of proposed RCx scopes**

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
PD-CH-1	Optimize Chiller Enthalpy and CHW System Control	0	0.0	0.0	0	$0	$0	$0	$0	0.00

Finding

The Police Department's chilled water system is a constant volume primary-only pumping system which serves the chilled water coils on AHU-1 and AHU-2 only. There are (2) 2 hp constant speed primary pumps and a nominal 40 ton Trane air cooled scroll compressor chiller. The chiller has (2) cooling circuits, each circuit has (2) compressors, for (4) total stages of cooling. The chilled water system is enabled by either dry bulb temperature (current setpoint is 63 deg) or enthalpy (current setpoint is 27 BTU/lb). The economizer lockout on the AHUs is also set to 27 BTU/lb, which results in the OA dampers being fully open and the chilled water valves also modulating open to maintain the discharge air temperature setpoint.

REFER TO ECM# PD-HV-1 FOR ESTIMATED ANNUAL ELECTRIC SAVINGS (kWh), SUMMER & WINTER PEAK DEMAND SAVINGS (kW), ANNUAL FOSSIL FUEL SAVINGS (CCF), ELECTRIC COST SAVINGS, FOSSIL FUEL COST SAVINGS, TOTAL ESTIMATED ANNUAL SAVINGS, IMPLEMENTATION COST AND PAYBACK.

Solution

Reprogram the Alerton BMS control logic software to enable the chiiled water system using OA Enthalpy control (21.5 Btu/lb) and cycle the chiller operation, mantaining CHWS temperature setpoint, upon request for CHW cooling from either AHU during days with small building cooling loads. Dual enthalpy comparison economizer controls on the AHUs will be programmed as part of ECM PD-HV-1, which will optimize the interaction between OA economizer and CHW cooling operation.

Verification

Review all chilled water system operation and Alerton trending reports from the BMS after implementation of RCx changes and compare to existing trending reports for the chilled water system. Print out Alerton graphic control screens on the BMS showing and verifying all new sequence of operations and control programming enhancements as per the RCx modifications.

Persistence Strategy

Program a persistence chiller trend on the BMS which will be reviewed monthly, trending OA enthalpy, chiller status and AHU call for cooling. The operator shall review trends to assure that the CHW system is operating as per the revised control sequence as documented in the RCx program. All trend points will have (60 Min) intervals.
Generate an alarm at the BMS if the chiller system is enabled while there is no AHU call for mechanical cooling for more than (60 Min).

10/13/2011

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
PD-HV-1	Optimize AHU-1 & AHU-2 VAV Systems and Enhance Building Perimeter HW Radiation System	28,265	0.0	0.0	392.1	$5,137	$791	$5,928	$40,521	6.84

Finding

AHU-1 and AHU-2 are variable air volume units serving a total of 35 VAV boxes within the Police Department. AHU-1 supplies 5,500 CFM and AHU-2 supplies 10,000 CFM with variable frequency drives on the supply fans and are both required to operate 24/7.
AHU-1 has a 5HP supply fan motor and serves 13 VAV boxes and AHU-2 has a 7.5HP supply fan motor and serves the remaining 22 VAV boxes. The AHUs have a HW heating coil and a CHW cooling coil with dry bulb OA economizer control designed to provide heating and cooling for discharge air temperature control. The supply temperature setpoint is reset based on the return temperature and controls discharge air temperature between 55-67 deg. The AHUs have an enthalpy based economizer lock out when the outdoor air enthalpy is greater than 27 BTU/lb. Each AHU has a return air CO2 sensor and the demand control ventilation sequence is operating as designed with a setpoint of 875 ppm. Both AHUs typically operate above 55 Hz at all times and are unable to maintain the 1.1" static pressure setpoint for each and during the winter the AHUs still exhibit excessive airflow due to the VAV boxes needed calibration and the building perimeter HW radiation overheating the spaces. Between 40 deg and 50 deg, the perimeter single zone radiation loop tends to overheat the building, causing the AHUs to operate at excessive fan speeds.
All VAV boxes are cooling only type boxes with no heat and serve offices, conference rooms and other administrative areas within the Police Department. Many of the boxes read incorrect airflows, and many of the dampers are fully open. Additionally, most of the boxes have identical sizes and k-factors programmed into the Alerton BMS. The VAV boxes have separate unoccupied setpoints, however there is no schedule programmed.
The Building is heated by single zone perimeter radiation loop which runs throughout the building and controls off of OA temperature. There are no control valves on the system and the boilers are enabled with the pump below 50 deg outdoor air temperature.
THIS ECM INCLUDES ALL ESTIMATED ANNUAL ELECTRIC SAVINGS (kWh), SUMMER & WINTER PEAK DEMAND SAVINGS (kW), ANNUAL FOSSIL FUEL SAVINGS (CCF), ELECTRIC COST SAVINGS, FOSSIL FUEL COST SAVINGS, TOTAL ESTIMATED ANNUAL SAVINGS, IMPLEMENTATION COST AND PAYBACK FOR ECM# PD-CH-1, PD-HV-1 AND PD-HV-2.

Solution

Add and program on the Alerton BMS for AHU-1 & 2 discharge air static pressure reset control, monitoring maximum VAV box damper positions, with a reset schedule of (.8" - 1.2" in/wc). Reprogram the Alerton BMS for dual enthalpy economizer control on all units comparing return air and outside air enthalpy with a (2.0 Btu/lb differential). Adjust and calibrate the outside air dampers for proper operation, stroke and close-off. Reconfigure and fine-tune the supply discharge air temperature control program on the BMS eliminating simultaneous heating and cooling and calibrate the outputs of all heating and cooling valves. Implement a demand control ventilation sequence with a return air CO2 enable setpoint of (1000 ppm) and adjust the outside air minimum quantity for each AHU to the reduced base ventilation rates outlined in the ASHRAE 62.2 Standards.
All VAV boxes shall be field calibrated for proper airflow and all heating / cooling (Occ /Unocc) CFM setpoints shall be adjusted and control heating / cooling parameters "fine-tuned" for proper sequencing and operation. Update the Alerton BMS to include the most recent VAV box sizes and k-factors.
Add and program additional control for the building hot water perimeter radiation system to limit excessive overheating of the spaces as follows:
For OA temperatures >40 deg F: The hot water system shall cycle on and off as required to maintain the lowest zone temperature above the occ/unocc setpoints (69/65 deg). The pumps shall have user adjustable minimum on and off times to prevent excessive pump cycling.

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback

For OA temperatures <40 deg F: The hot water system shall run continuously and maintain supply temperature based on the existing OA reset schedule. The supply temperature setpoint shall be lowered below the existing temperature setpoint as the lowest zone temperature rises above the occ/unocc setpoints (69/65 deg).

Verification

Review all air handling unit operation and Alerton trending reports from the BMS after implementation of RCx changes and compare to existing trending reports for the air handling systems. Print out Alerton graphic control screens on the BMS showing and verifying all new sequence of operations and control programming enhancements as per the RCx modifications.

Persistence Strategy

Program a system trend on the BMS for AHU-1 & -2 for the following points: supply fan VFD speed, supply fan status, OA damper position, supply air discharge air static pressure and setpoint. Program a system trend on the BMS for the hot water system for the following points: lowest zone temperature, hot water supply temperature, hot water temperature setpoint and pump status. All trended BMS points shall have (60 Min. intervals).

Generate an alarm at the BMS if the supply discharge air static pressures reads greater than (.25"wc) above the calculated reset control setpoint for more than (60 Min).

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
PD-HV-2	Add Return CO2 Sensor and Demand Control Ventilation to RTU-1	0	0.0	0.0	0	$0	$0	$0	$0	0.00

Finding

RTU-1 is a 1110 CFM constant volume unit with a 1HP supply fan motor with a DX cooling coil and (two) hot water and electric reheat coils which serves the Dispatch area of the Glastonbury Police Department. The hot water reheat is utilized when the boiler system is in operation (OA temperature is below 50 deg F) while the electric reheat is enabled when the OA temperature is above 48 deg F and the boilers are off. Electric heating is operated as a backup to the hot water heat and rarely operates. The dispatch area is occupied 24/7 and the RTU utilizes outdoor air dry bulb economizer controls setpoint 55F.

REFER TO ECM# PD-HV-1 FOR ESTIMATED ANNUAL ELECTRIC SAVINGS (kWh), SUMMER & WINTER PEAK DEMAND SAVINGS (kW), ANNUAL FOSSIL FUEL SAVINGS (CCF), ELECTRIC COST SAVINGS, FOSSIL FUEL COST SAVINGS, TOTAL ESTIMATED ANNUAL SAVINGS, IMPLEMENTATION COST AND PAYBACK.

Solution

Install a CO2 sensor in the return duct and implement a demand control ventilation sequence with a return air CO2 enable setpoint of (1000 ppm). Adjust and calibrate the outside air damper for proper operation, stroke and close-off and adjust the outside air minimum quantity to the reduced base ventilation rates outlined in the ASHRAE 62.2 Standards.

Verification

Review all roof top unit operation and Alerton trending reports from the BMS after implementation of RCx changes and compare to existing trending reports for the air handling systems. Print out Alerton graphic control screens on the BMS showing and verifying all new sequence of operations and control programming enhancements as per the RCx modifications.

Persistence Strategy

Program a system trend on the BMS for the following RTU-1 points: CO2 reading and OA damper position. All trended BMS points shall have 60 (Min. intervals).

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
RCC-HV-1	Optimize VAV Box Control, Dual Enthalpy Economizer Operation and Add Static Pressure Reset to AHU-1	17,744	0.0	0.0	667.4	$3,225	$1,346	$4,571	$17,136	3.75

Finding

AHU-1 is a 12,000 CFM unit with a 15 hp supply and 10 hp return fan which serves 22 VAV boxes within the Riverfront Community Center. AHU-1 is a cooling dominant unit with a hot water coil and direct expansion (DX) cooling which operates based on a time schedule for 96 hours per week. The unit has a return air CO2 sensor for demand control ventilation (875 ppm setpoint) and outdoor air dry bulb economizer controls however the dampers do not appear to stroke properly.

The supply and return fan VFD commands output a 4-20 mA signal to the ABB drives, but the drives are expecting a 0-20 mA signal. The drives still maintain static pressure, however the actual fan speed are higher than the command shown on the BMS.

One VAV box has a parallel fan, the remainder are pressure independent boxes with either a heating coil in the box or associated baseboard radiation heating. Typical VAV temperature setpoints are maintained, however some heating setpoints have been set as high as 73 deg and some boxes are not reading actual airflow.

Solution

Reconfigure the supply and return fan VFD for the correct input signal. Add and program on the Alerton BMS discharge static pressure reset VFD control with a reset schedule of (.7" - 1.1"). Reprogram the Alerton BMS for dual enthalpy economizer control on all units comparing return air and outside air enthalpy with a (2.0 Btu/lb differential). Adjust the outside air dampers for proper operation, stroke and close-off. Reconfigure the supply air temperature control program to adjust the outputs of all heating and cooling devices to modulate to control the supply air temperature setpoint and retune the supply air temperature control loops. Implement a demand control ventilation sequence with a return air CO2 enable setpoint of (1100 ppm). Also adjust the outside air damper for proper operation, stroke and close-off. New minimum damper position will be determined per ASHRAE 62.2 standards.

Adjust and modify the occupied / unoccupied setpoints for all VAV boxes (total of 22) (70F heating / 74F cooling) and (65F heating / 80F cooling). All VAV boxes shall be field calibrated for proper airflow and all heating / cooling (Occ /Unocc) CFM setpoints shall be adjusted and control heating / cooling parameters "fine-tuned" for proper sequencing and operation. An allowance shall be provided to rebalance up to (10) VAV boxes identified during implementation.

Verification

Review all air handling unit operation and Alerton trending reports from the BMS after implementation of RCx changes and compare to existing trending reports for the air handling systems. Print out Alerton graphic control screens on the BMS showing and verifying all new sequence of operations and control programming enhancements as per the RCx modifications.

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback

Persistence Strategy

Program a system trend on the BMS for AHU-1 for the following points: supply fan VFD speed, supply fan status, OA damper position, supply air discharge air static pressure and setpoint. All trended BMS points shall have 60 (Min. intervals).

Generate an alarm at the BMS if the supply discharge air static pressures reads greater than (.25"wc) above the calculated reset control setpoint for more than (60 Min).

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
RCC-HV-2	Add Interlocks for MAU-1 and Kitchend Hood Operation	0	0.0	0.0	0	$0	$0	$0	$0	0.00

Finding

MAU-1 is a direct-fired gas heated makeup air unit which serves the kitchen area of the Riverfront Community Center. It supplies 1,600 CFM with a 0.75 hp motor and is designed to operate in conjunction with the 2,000 CFM, 1 hp kitchen exhaust hood. The space conditioning is provided by AHU-2 which serves the adjacent community room. MAU-1 was found switched off and facility personnel have returned MAU-1 to service. The exhaust hood is operated by a manual switch located in the kitchen and has been found on while the kitchen was not being used. Neither the Kitchen Exhaust Fan nor MAU-1 are controlled or monitored by the Alerton BMS.

ESTIMATED ANNUAL ELECTRIC SAVINGS = 3,763 kWh
ESTIMATED SUMMER PEAK DEMAND SAVINGS = 0 kW
ESTIMATED WINTER PEAK DEMAND SAVINGS = 0 kW
ESTIMATED ANNUAL FOSSIL FUEL SAVINGS = 774.4 ccf
ESTIMATED ELECTRIC COST SAVINGS = $684.00
ESTIMATED FOSSIL FUEL COST SAVINGS = $1,206.00
TOTAL ESTIMATED ANNUAL SAVINGS = $1,890.00
ESTIMATED IMPLEMENTATION COST = $5,878
ESTIMATED PAYBACK = 3.1 YEARS.
DUE TO LACK OF BMS CONNECTIVITY THIS ECM IS CATEGORIZED AS AN "NTI" AND WILL NOT BE IMPLEMENTED AS PART OF THE RCx PROGRAM.

Solution

The existing local operating switch on the control panel for the kitchen exhaust shall be replaced with a new adjustable digital electronic time switch for the kitchen exhaust fan operation. For normal operation kitchen personnel shall only turn switch on in the morning and shall operate for a programmable 5 hours then shut down automatically.

Verification

Review all exhaust fan and makeup air unit operation and Alerton trending reports from the BMS after implementation of RCx changes and compare to existing trending reports for the air handling systems. Print out Alerton graphic control screens on the BMS showing and verifying all new sequence of operations and control programming enhancements as per the RCx modifications.

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback

Persistence Strategy

Generate an alarm at the BMS if the MAU and kitchen exhaust fan status does not match.

10/13/2011

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
TH-HV-1	Optimize VAV Box Control, Economizer Operation and Add Static Pressure Reset to AHU-1, -2 & -3	0	0.0	0.0	0	$0	$0	$0	$0	0.00

Finding

AHU-1, -2 & -3 are variable air volume (VAV) systems with direct expansion (DX) cooling serving 76 VAV boxes within the Glastonbury Town Hall. The AHU design airflow and supply fan horsepower are listed below:

•AHU-1 serves 22 VAV boxes with a 3,735 CFM, 3 HP supply fan.
•AHU-2 serves 27 VAV boxes with a 6,280 CFM, 5 HP supply fan.
•AHU-3 serves 28 VAV boxes with a 9,444 CFm, 7.5 HP supply fan.

Each AHU is equipped with outdoor air enthalpy economizer switch (the enable setpoints vary from 25-27 BTU/lb for each AHU) and supply and return humidity sensors used for space humidification control. Humidification has been disabled, and the supply humidity sensors do not proved accurate readings. AHU-1 and -3 operate 6:30am-6:30pm M-F and AHU-2 operates 6:30am-11:30pm M-F. There is not currently demand control ventilation.

Space heating is provided by an open perimeter radiation loop which is controlled based on OA temperature. The heating loop temperature is reset based OA temperature, however spaces are generally overheated, causing excessive economizer operation and fan speeds.

The VAV boxes have flow rings and read actual airflow at the BMS but each box only modulates between minimum and maximum damper position setpoints based on space temperature, and does not control to airflow setpoints. The air side of the VAV system is not balanced; AHU-1 typically operates above 45 Hz while AHU-2 and -3 operate at 60 Hz.

ESTIMATED ANNUAL ELECTRIC SAVINGS = 13,728 kWh
ESTIMATED SUMMER PEAK DEMAND SAVINGS = 0 Kw
ESTIMATED WINTER PEAK DEMAND SAVINGS = 0 Kw
ESTIMATED ANNUAL FOSSIL FUEL SAVINGS = 0 CCF
ESTIMATED ELECTRIC COST SAVINGS = $2,495
ESTIMATED FOSSIL FUEL COST SAVINGS = $0
TOTAL ESTIMATED ANNUAL SAVINGS = $2,495.00
ESTIMATED IMPLEMENTATION COST = $29,538
ESTIMATED PAYBACK = 11.8 YEARS.
DUE TO HIGH PAYBACK THE TOWN OF GLASTONBURY HAS CATEGORIZED THIS ECM AS AN "NTI" AND WILL NOT BE IMPLEMENTED AS PART OF THE RCx PROGRAM.

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback

Solution

Balance (76) VAV boxes and program the Alerton BMS with minimum and maximum airflow setpoints for each box. Adjust and modify the occupied / unoccupied setpoints for all VAV boxes (total of 76) (70F heating / 74F cooling) and (65F heating / 80F cooling). All VAV boxes shall be field calibrated for proper airflow and all heating / cooling (Occ /Unocc) CFM setpoints shall be adjusted and control heating / cooling parameters "fine-tuned" for proper sequencing and operation.

Add and program on the Alerton BMS discharge static pressure reset VFD control to AHU-1, -2 and -3 with a reset schedule of (.8" - 1.2"). The setpoints shall be field determined during implementation to ensure minimum airflow across the DX coils at all times. Install and wire (3) CO2 sensors in the return ducts and implement a demand control ventilation sequence with a return air CO2 enable setpoint of (1100 ppm). Reprogram the Alerton BMS for dual enthalpy economizer control on all units comparing return air and outside air enthalpy with a (2.0 Btu/lb differential). Adjust the outside air dampers for proper operation, stroke and close-off.

Verification

Review all air handling unit operation and Alerton trending reports from the BMS after implementation of RCx changes and compare to existing trending reports for the air handling systems. Print out Alerton graphic control screens on the BMS showing and verifying all new sequence of operations and control programming enhancements as per the RCx modifications.

Persistence Strategy

Program a system trend on the BMS for AHU-1, -2 & -3 for the following points: supply fan VFD speed, supply fan status, OA damper position, supply air discharge air static pressure and setpoint. All trended BMS points shall have 60 (Min. intervals).

Generate an alarm at the BMS if the supply discharge air static pressures reads greater than (.25"wc) above the calculated reset control setpoint for more than (60 Min).

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ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
TH-HW-1	Optimize Boiler Operation and Pumping Controls	42,348	1.3	2.9	3006.2	$7,697	$6,063	$13,760	$35,229	2.56

Finding

The Glastonbury Town Hall's hot water system consists of (2) HB Smith cast iron hot water boilers. Hot water is pumped to 3 different zones to provide radiant heating. Pumps 1/1A provide primary flow through the boilers and serve C Wing (Facilities Offices, Gym & Community Room) via 10 hp pumps. Pumps 2/2A provide heat to D Wing, which is largely unused; heat is only required to prevent freezing of the fire protection piping. Pumps 3/3A serve A Wing (Town Hall offices) through an open perimeter radiation loop. Pumps 2/2A and 3/3A are all 2 hp. The boilers and pumps 1/1A and 2/2A are enabled simultaneously based on OA temperature, currently set to 56 deg F, and the hot water temperature is reset based on OA temperature. Pump 3/3A is enabled at 54 deg F, has a lower temperature reset schedule and the supply temperature is controlled by a 3-way valve. Overall, the hot water system is overheating A-Wing through the open radiation loop causing excessive fan speeds as the AHU's attempt to re-cool the spaces.

THIS ECM INCLUDES ALL ESTIMATED ANNUAL ELECTRIC SAVINGS (kWh), SUMMER & WINTER PEAK DEMAND SAVINGS (kW), ANNUAL FOSSIL FUEL SAVINGS (CCF), ELECTRIC COST SAVINGS, FOSSIL FUEL COST SAVINGS, TOTAL ESTIMATED ANNUAL SAVINGS, IMPLEMENTATION COST AND PAYBACK FOR ECM#TH-HW-1 AND TH-OCC-1

Solution

Install separate control relays and program pump 2/2A to enable at 40 deg F OAT to provide minimum freeze protection for D Wing.

Program additional controls for pumps 3/3A serving A wing as follows:

For temperatures >40 deg F: Pump 3/3A shall cycle on and off, utilizing the 3-way valve to supply minimum temperature hot water to the open radiation loop as required to maintain the lowest zone temperature above the occ/unocc setpoints (69/65 deg). The pumps shall have user adjustable minimum on and off times to prevent excessive pump cycling.

For temperatures <40 deg F: Pump 3/3A shall run continuously and cycle the 3-way valve to maintain supply temperature based on the existing OA reset schedule. The supply temperature setpoint shall be lowered below the existing temperature setpoint as the lowest zone temperature rises above the occ/unocc setpoints (69/65 deg).

Verification

Review all hot water system operation and Alerton trending reports from the BMS after implementation of RCx changes and compare to existing trending reports for the air handling systems. Print out Alerton graphic control screens on the BMS showing and verifying all new sequence of operations and control programming enhancements as per the RCx modifications.

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback

Persistence Strategy

Program a system trend on the BMS for the following hot water system points: all pump status, three-way valve position, A-wing supply temperature and setpoint. All trended BMS points shall have 60 (Min. intervals).

Generate an alarm at the BMS if the A-wing supply temperature reads greater than (10 deg F) above the calculated reset control setpoint for more than (60 Min).

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
TH-OCC-1	Add Space Occupancy Control for Lighting and HVAC in Community Rooms and Gym	0	0.0	0.0	0	$0	$0	$0	$0	0.00

Finding

The Academy School Gymnasium has (2) heating-only ventilation units operating on existing pneumatic controls which operate 24/7 with no DDC controls. Each ventilation unit is equipped with a 5,740 CFM, 3 HP supply fan, a hot water coil, return air damper and a separate exhaust fan which operates by electronic timer.
Lighting is provided by (24) 8' 4-bulb T-8 fixtures controlled by manual switches.
Lights remain on approximately 12 hours per day.

The Community room is served by a 6000 CFM cooling only unit with a 3.7 HP supply fan motor. This AHU is required only for space conditioning and operates on stand-alone controls via local thermostat and operates during the cooling season regardless of occupancy. The AHU has a nominal 15 ton DX cooling capacity and space heating is provided by the open radiation loop which serves the remainder of the building. The AHU also has an integrated solid state economizer module with an enthalpy lockout of approximately 27 BTU/lb.
Lighting is provided by (16) 4' 2-bulb T-8 fixtures controlled by manual switches. Lights remain on approximately 12 hours per day.

REFER TO ECM# TH-HW-1 FOR ESTIMATED ANNUAL ELECTRIC SAVINGS (kWh), SUMMER & WINTER PEAK DEMAND SAVINGS (kW), ANNUAL FOSSIL FUEL SAVINGS (CCF), ELECTRIC COST SAVINGS, FOSSIL FUEL COST SAVINGS, TOTAL ESTIMATED ANNUAL SAVINGS, IMPLEMENTATION COST AND PAYBACK.

Solution

The Town of Glastonbury shall install DDC controls for the Gymnasium and Community Room AHUs and integrate these into the existing building's Alerton control system.
Install a total of four (4) occupancy sensors in the Gymnasium area controlling the lighting fixtures and the RTUs. The occupancy sensors shall turn on the lights for its respective zone instantly when activated. The associated ventilation units and exhaust fans will start when the sensor is active for (10) minutes (adj). When no motion has been sensed for (10) minutes (adj) both the lights and the RTU for that zone will turn off.
Install a total of two (2) occupancy sensors in the Community Room area controlling the lighting fixtures and the AHU. The occupancy sensors shall turn on the lights for its respective zone instantly when activated. The associated AHU will start when the sensor is active for (10) minutes (adj). When no motion has been sensed for (10) minutes (adj) both the lights and the AHU will turn off.

Verification

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback

Persistence Strategy

The Town of Glastonbury shall conduct walk-throughs monthly year round during to verify that the gym and community room lighting fixtures and air handling units are not on when the areas are not being used and that the infra-red motion detectors are operating correctly.

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
WTL-DT-1	Optimize Boiler Staging and Add Seasonal DP Control to Secondary Pumping System	31,986	3.1	6.1	2488	$5,814	$5,018	$10,832	$50,461	4.66

Finding

Welles Turner Library has hot water and chilled water systems which are distributed to the building by a 2-pipe system which provides heating and cooling to (2) AHUs, 1 MAU and various FCU and unit heaters. The secondary system also feeds the original library FCUs and radiators which do not have control valves. There are (2) 10 HP variable speed pumps which provides flow either through a plate and frame heat exchanger for cooling or through the boiler primary loop for heating. The hot water boilers are 5 modular units which are staged on by the Alerton BMS to maintain a constant primary temperature with (1) constant speed 1.5 hp primary pump. The chiller is a nominal 110 ton, air cooled outdoor chiller with (4) reciprocating compressors. Primary chilled water flow is provided by (2) 7.5 HP constant speed pumps which pump a propylene glycol solution between the chiller and a plate and frame heat exchanger.
The Alerton BMS automatically switches between heating and cooling modes, heating is enabled below 52 deg and cooling is enabled above 65 deg. In between these setpoints, all equipment remains off.
While in the heating mode, the boilers maintain a constant primary temperature, however the control algorithm responds slowly, stages boilers on unnecessarily and overshoots the primary loop temperature setpoint (190 deg). The secondary supply temperature is reset based on OA temp and is controlled by a modulating 4-way ball valve. The position of the 4-way valve does not affect the volumetric flow rate in either the primary or secondary loops. This allows the constant volume primary pump and variable volume secondary pumps to operate properly independent of the 4-way valve's position.
While in the cooling mode, the chiller primary pump operates and the secondary pumps provide flow through the plate and frame heat exchanger then to the building's coils. Radiators in the original library area are manually valved off but cooling is provided to FCUs.
The secondary pumping system and water coils were designed for cooling loads and the differential pressure setpoint remains constant at 15 psi. This does not account for the varied differential pressures between pumping through the plate and frame versus pumping through the 4-way valve.

THIS ECM INCLUDES ALL ESTIMATED ANNUAL ELECTRIC SAVINGS (kWh), SUMMER & WINTER PEAK DEMAND SAVINGS (kW), ANNUAL FOSSIL FUEL SAVINGS (CCF), ELECTRIC COST SAVINGS, FOSSIL FUEL COST SAVINGS, TOTAL ESTIMATED ANNUAL SAVINGS, IMPLEMENTATION COST AND PAYBACK FOR ECM#WTL-DT-1 AND WTL-HV-1.

Solution

Program the Alerton BMS with a critical valve reset program for the secondary pumping system. The secondary pump DP setpoint shall be reset between (9-15 psi) based on the position of the dual temperature control valves within the system. These setpoints shall be field verified during implementation to ensure proper flow to all devices. Tune the boiler staging algorithm in the Alerton BMS to limit the number of boiler units enabled and prevent overheating of the primary loop. Add (14) control valves to designated fan coil units in the original library area. These valves shall be wired to the existing FCU controller and provide the first stage of heating within their respective areas.

Verification

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback

Persistence Strategy

Program a system trend on the BMS for the following hot water system points: secondary pump status, differential pressure and secondary pump VFD speed. All trended BMS points shall have 60 (Min. intervals).

Generate an alarm at the BMS if the secondary differential pressure reads greater than (.25"wc) above the calculated reset control setpoint for more than (60 Min adj.).

Generate an alarm at the BMS if a pump is on and start conditions are not met.

EA-10-M-006-010

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
WTL-HV-1	Add VFDs and Seasonal Control to AHU-1 & -2	0	0.0	0.0	0	$0	$0	$0	$0	0.00

Finding

AHU-1 & -2 are constant volume units serving the second floor stack area of the Welles Turner Library. Each AHU has a 5 Hp, 5700 CFM supply fan and a 1.5 Hp, 5700 CFM return fan. Heating and cooling is provided by dual temperature coils in each unit. Both cooling and economizer modes are determined by dry bulb OA temperature and each AHU has a CO2 sensor for demand control ventilation (current setpoint is 800 ppm). Each AHU is controlled by separate temperature sensors and heating, cooling and economizing operations are not coordinated.

There is one time schedule controlling the occupied operation for all HVAC equipment in the library. The schedule operates for 92 hours a week while the library's occupied hours are typically less than 80 hours per week. The schedule also does not reflect the library being closed on Sunday during the summer.

REFER TO ECM# WTL-DT-1 FOR ESTIMATED ANNUAL ELECTRIC SAVINGS (kWh), SUMMER & WINTER PEAK DEMAND SAVINGS (kW), ANNUAL FOSSIL FUEL SAVINGS (CCF), ELECTRIC COST SAVINGS, FOSSIL FUEL COST SAVINGS, TOTAL ESTIMATED ANNUAL SAVINGS, IMPLEMENTATION COST AND PAYBACK.

Solution

Install combination temperature and humidity sensors in the return duct and program dual enthalpy comparison economizer control.

Install supply fan VFDs on AHU-1 & -2. When the OAT is less than (45 deg F adj) operate the supply fan VFD at 40Hz (adj) and when the OAT is greater than (45 deg F adj) plus a 2 deg F offset, operate the supply fan VFD at 55 Hz (adj).

Modify the schedule to match the building occupancy and enable optimal start in AHU-1 and -2 (M, Tue & Thu 7am-9pm, Wed 12pm-9pm, Fri and Sat 9am-6pm and Sun 1pm-5pm). Add a summer holiday schedule (Mid-May, June, July and August) to reflect that the library is closed on Sunday. Implement a demand control ventilation sequence with a return air CO2 enable setpoint of (1100 ppm). Also adjust the outside air damper for proper operation, stroke and close-off. New minimum damper position will be determined per ASHRAE 62.2 standards.

Verification

Review all air handling unit operation and Alerton trending reports from the BMS after implementation of RCx changes and compare to existing trending reports for the air handling systems. Print out Alerton graphic control screens on the BMS showing and verifying all new sequence of operations and control programming enhancements as per the RCx modifications.

ECM #	ECM Title	Estimated Annual Electric Savings kWh	Peak Demand kW Summer	Peak Demand kW Winter	Estimated Annual Fossil Fuel Saving CCF	Electric Cost Savings	Fossil Cost Savings	Total Estimated Annual Savings	Implement-ation Cost	Payback
Persistence Strategy										
	Program a system trend on the BMS for the following AHU points: supply fan status, supply fan VFD speed and current mode of operation. All trended BMS points shall have 60 (Min. intervals).									
	Generate an alarm at the BMS if a fan is on and start conditions are not met.									
	GRAND TOTAL:	120,343	4.4	9.0	6,553.7	$21,873	$13,218	$35,091	143,346	4.08

ATTACHMENT B
PROPOSAL RESPONSE PAGE

TOWN OF GLASTONBURY
PROPOSAL RPGL # 2013-36
DATE ADVERTISED _____ DATE / TIME DUE May 28, 2013 at 11:00 am

NAME OF PROPOSAL DIRECT DIGITAL CONTROL SERVICES

Pricing proposals shall include line items for:

PD-CH-1	$_____
PD-HV-1	$_____
PD-HV-2	$_____
RCC-HV-1	$_____
RCC-HV-2	$_____
TH-HV-1	$_____
TH-HW-1	$_____
TH-OCC-1	$_____
WTL-DT-1	$_____
WTL-HV-1	$_____
Total	$_____ (numeric)
Total	$_____ (written)

Additionally, proposals shall include:

a. **Hourly labor rates for on-going service work**

Vendor
Name: _____

CODE OF ETHICS:
I / We have reviewed a copy of the Town of Glastonbury's Code of Ethics and agree to submit a Consultant Acknowledgement Form if I /We are selected. Yes _____ No _____ *

***Respondent is advised that effective August 1, 2003, the Town of Glastonbury cannot consider any proposal where the respondent has not agreed to the above statement.**

The Respondent acknowledges receipt of the following Addendums:

Addendum #1_____ Date:_____
Addendum #2_____ Date:_____
Addendum #3_____ Date:_____

Type or Print Name of Individual	**Doing Business as (Trade Name)**
Signature of Individual	**Street Address**
Title	**City, State, Zip Code**
Date	**Telephone Number / Fax Number**
E-Mail Address	**SS # or TIN#**

(Seal – If proposal is by a Corporation)

Attest

ATTACHMENT C

TOWN OF GLASTONBURY
PROCUREMENT NOTICE
REQUEST FOR PROPOSAL
DIRECT DIGITAL CONTROL SERVICES

NON-COLLUSION STATEMENT

The company submitting this proposal certifies that it is being submitted without any collusion, communication or agreement as to any matter relating to it with any other respondent or competitor. We understand that this proposal must be signed by an authorized agent of our company to constitute a valid proposal.

Date: _____

Name of Company: _____

Name and Title of Agent: _____

By (SIGNATURE): _____

Address: _____

_____

_____

Telephone Number: _____