

REQUEST FOR PROPOSALS

Pierce County Fire District No. 5 (Gig Harbor Fire & Medic One) is requesting proposals for the replacement of a HVAC controller system. Proposed system must control all existing Building Automation System (BAS) controlled HVAC systems at the Fire District Headquarters building. Proposed system shall also add control to the existing, stand-alone Carrier Heat Pump located in the 2nd floor, SE Mechanical Room. (This Heat Pump serves the general office space and is currently controlled by a 7-day programmable thermostat.) Significant evaluation factors include the following, which are ranked in order of their relative importance: (1) Price, (2) Flexibility (easily control rooms or zones), (3) Variety of features, (4) health and environmental considerations, (5) Warranty, and (6) Customer Service. Proposal should include at least the following features: a. A BACnet-compliant controls system with a graphics user interface (GUI), global controller, and unitary controller architecture. b. Web-based or web-accessible graphics user interface. c. Ability to collect trendlogs, generate alarms, and modify operating time schedules. d. Graphics showing accurate depictions of the HVAC equipment, capable of displaying real-time status information via animation. e. Detailed design drawings showing floorplans, all pieces of hardware, all pieces of controlled equipment, and all analog and binary objects. f. Gig Harbor Fire & Medic One shall have the ability to view and modify the graphical user interface design, the programming files, and all setpoints, alarms, schedules and trendlogs. g. Gig Harbor Fire & Medic One shall own the Building Automation System software license. h. The primary Building Automation System database shall reside at a location within the Gig Harbor Fire & Medic One network. Project specific work and details may be found at the Fire District webpage at gigharborfire.org. Proposals will be accepted until 5:00 p.m. on Wednesday November 7th, 2018 at 10222 Bujacich Road NW, Gig Harbor WA 98332. Please clearly label your proposal packet "RFP HVAC System". Meetings will be scheduled following the closing of proposals with all responsible vendors to evaluate their specific proposal. Any questions should be addressed to Eric Watson at 253-851-3111 or ewatson@gigharborfire.org.

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DIRECT DIGITAL CONTROL SYSTEM FOR HVAC

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish a BACnet-based control upgrade to the Gig Harbor Fire & Medic One building DDC Control System to make it compatible with modern Microsoft Windows or Microsoft Server software platforms. (Controls system server computer will be provided by the owner.)
- B. Work shall include replacement of the existing global controller, unitary controllers, controls system communication wire networks, and wall mounted thermostats.
- C. Connect controls to the existing, 2nd floor stand-alone Heat Pump. Re-use the existing return and outside air damper motors. Install control devices and wire to match what is installed on existing controlled heat pumps. Remove existing thermostat and replace with new wall mounted thermostat.
- D. Provide all necessary BACnet-compliant hardware and software to meet the system's functional specifications.
- E. Prepare individual hardware layouts, interconnection drawings, and software configuration based on controls system design.
- F. Implement the detailed design for all analog and binary objects, system databases, graphic displays, logs, and management reports based on control descriptions, logic drawings, configuration data, and bid documents. Provide graphic updates for existing IBEX equipment being displayed on the Gig Harbor Fire & Medic One controls network. All existing control points used shall be exposed and remain changeable in the new BACnet system.
- G. Provide as-built documentation, operator's terminal software, diagrams, and all other associated project operational documentation (such as technical manuals) on approved media, the sum total of which accurately represents the final system.
- H. Provide new wall temperature sensors. Re-use existing dampers, valves, duct mounted temperature sensors, and other compatible, existing, peripheral controls devices (and wiring).

1.02 SYSTEM DESCRIPTION

- A. This system is to control the building's existing HVAC mechanical equipment per the existing Sequence of Operations and to communicate from all existing controllers to the Graphical User Interface front-end system.
- B. Building controllers shall include complete energy management software, including scheduling building control strategies with optimum start and logging routines. All energy management software and firmware shall be resident in field hardware and shall not be dependent on the operator's terminal. Operator's terminal software is to be used for access to field-based energy management functions only. Provide zone-by-zone direct digital logic control of space temperature, scheduling, runtime

accumulation, equipment alarm reporting, and override timers for after-hours usage.

- C. Room sensors shall be the same as existing - a blank plate with push button override.

1.03 APPROVED MANUFACTURERS

- A. The DDC system shall be the BACtalk/Compass system from Alerton as an extension of the existing DDC system.

Approved Control Manufacturers

1. Alerton as installed by ATS Automation (425 251-9680)

1.04 QUALITY ASSURANCE

- A. The Building Automation System (BAS) system shall be designed, installed, tested, and serviced by manufacturer authorized and trained personnel.
- B. Materials and equipment shall be manufacturer's latest standard design that complies with the specification requirements.
- C. All BAS peer-to-peer network controllers, central system controllers and local user displays shall be UL Listed.
- D. All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.

1.05 SUBMITTALS

A. Drawings

1. The system supplier shall submit engineered drawings, control sequence, and bill of materials for approval.
2. Drawings shall be submitted in the following standard sizes: 11" x 17" (ANSI B).
3. Submittals shall be provided electronically in PDF format.

B. System Documentation

Include the following in submittal package:

1. System configuration diagrams in simplified block format.
2. All input/output object listings
3. Electrical drawings that show all system internal and external connection points, terminal block layouts, and terminal identification.
4. Complete bill of materials for new equipment. Incorporate existing part information into the bill of material
5. Manufacturer's instructions and drawings for installation, maintenance, and operation of all purchased items.
6. Overall system operation and maintenance instructions—including preventive

maintenance and troubleshooting instructions.

1.06 WARRANTY

- A. Warranty shall cover all costs for parts, labor, associated travel, and expenses for a period of one year from completion of system acceptance.

PART 2: PRODUCTS

2.01 GLOBAL CONTROLLER

A. General Requirements

1. BACnet Conformance

Global Controller shall be approved by the BTL as meeting the BACnet Building Controller requirements.

- 2. Controller IP configuration can be done via a direct or remote connection with an operator's workstation or field computer.

B. BACnet MS/TP

- 1. BACnet MS/TP LAN must be software-configurable from 9.6 to 115.4Kbps

- a. Each BACnet MS/TP LAN shall support 64 BACnet devices at a minimum.

C. Power Supply

- 1. Input for power shall accept between 17 and 30VAC, 47 and 63Hz.
- 2. Optional rechargeable battery for shutdown of controller including storage of all data in flash memory.

2.02 TERMINAL UNIT APPLICATION CONTROLLERS

- A. Provide one native BACnet application controller for each HVAC zone unit. All controllers shall interface to building global controller through either MS/TP LAN using BACnet protocol, or Ethernet LAN using BACnet over Ethernet or BACnet TCP/IP.

B. BACnet Conformance

- 1. Application controllers shall be approved by the BTL as meeting the BACnet Advanced Application Controller requirements.

- C. Application controllers shall include universal inputs with 12-bit resolution that accept 3K and 10K thermistors, 0–10VDC, 0–5VDC, 4–20mA and dry contact signals. Any input on a controller may be either analog or digital with a minimum of three inputs that accept pulses. Controller shall also include support and modifiable programming for interface to intelligent room sensor with digital display. Controller shall include binary and analog outputs on board. Analog outputs with 12-bit resolution shall support either 0–10VDC or 0–20mA. Binary outputs shall have LED indication of status. Software shall include scaling features for analog outputs. Application controller shall include 20VDC voltage supply for use as power supply to external sensors.

- D. All program sequences shall be stored on board application controller in EEPROM. No batteries shall be needed to retain logic program.
- E. Programming of application controller shall be completely modifiable in the field over installed BACnet LANs or remotely using remote connection interface.

2.03 AUXILIARY CONTROL DEVICES

A. Temperature Sensors

- 1. All temperature sensors to be solid-state electronic, interchangeable with housing appropriate for application. Wall sensors to be installed in existing locations.

B. Room Temperature Sensor

1. Hardware

- a. Room sensor shall include:

- i. Temperature sensor
- ii. Push button for after-hours override

- b. Temperature sensor shall be a Uni-Curve Type II thermistor with an accuracy of ± 0.36 °F (0.3 °C) at calibration point over the range of 32 to 158 °F or better.

2.04 ENCLOSURES

- A. All controllers, power supplies and relays shall be mounted in enclosures, unless existing is surface mounted on equipment or within a plenum.
- B. Enclosures may be NEMA 1 when located in a clean, dry, indoor environment. Indoor enclosures shall be NEMA 12 when installed in other than a clean environment.
- C. Enclosures shall have hinged doors.

PART 3: EXECUTION

3.01 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence.
- B. Notify the owner's representative in writing of conditions detrimental to the proper and timely completion of the work.
- C. Do not begin work until all unsatisfactory conditions are resolved.

3.02 INSTALLATION (GENERAL)

- A. Install in accordance with manufacturer's instructions.

- B. Provide all miscellaneous devices, hardware, software, interconnections, installation, and programming required to ensure a complete operating system in accordance with the sequences of operation and point schedules.

3.03 LOCATION AND INSTALLATION OF COMPONENTS

- A. Locate and install components for easy accessibility. Obtain approval on locations from owner's representative prior to installation.
- B. All instruments, switches, transmitters, etc., shall be suitably wired and mounted to protect them from vibration, moisture, and high or low temperatures.

3.04 INTERLOCKING AND CONTROL WIRING

- A. Provide all interlock and control wiring. All wiring shall be installed neatly and professionally, in accordance with Specification Division 16 and all national, state and local electrical codes.
- B. Provide wiring as required by functions as specified and as recommended by equipment manufacturers, to serve specified control functions. Provide shielded low capacitance wire for all communications trunks.
- C. Control wiring shall not be installed in power circuit raceways. Magnetic starters and disconnect switches shall not be used as junction boxes. Provide auxiliary junction boxes as required. Coordinate location and arrangement of all control equipment with the owner's representative prior to rough-in.
- D. Provide auxiliary pilot duty relays on motor starters as required for control function.
- E. Provide power for all control components from nearest electrical control panel or as is existing.
- F. All control wiring in the mechanical, electrical, telephone and boiler rooms to be installed in raceways. All other wiring to be installed neatly and inconspicuously per local code requirements. If local code allows, control wiring above accessible ceiling spaces may be run with plenum-rated cable (without conduit).

3.05 DDC OBJECT TYPE SUMMARY

- A. Provide all database generation.
- B. Displays
 - 1. System displays shall show all analog and binary object types within the system. They shall be logically laid out for easy use by the owner. Provide outside air temperature indication on all system displays associated with economizer cycles.
- C. Run Time Totalization
 - 1. At a minimum, run time totalization shall be incorporated for each monitored supply fan, return fan, exhaust fan, hot water and chilled water pumps. Warning limits for each point shall be entered for alarm and or maintenance purposes.
- D. Trendlog
 - 1. All binary and analog object types (including zones) shall have the capability to

be trended.

E. Alarm

1. All analog inputs (High/Low Limits) and selected binary input alarm points shall be prioritized and routed (locally or remotely) with alarm message per owner's requirements.

F. Database Save

1. Provide backup database for all standalone application controllers on disk.

3.06 FIELD SERVICES

- A. Prepare and start logic control system under provisions of this section.
- B. Start up and functional test systems. Allow sufficient time for startup and functional testing prior to placing control systems in permanent operation.
- C. Provide the capability for off-site monitoring at control contractor's local or main office. At a minimum, off-site facility shall be capable of system diagnostics. Owner shall provide network access for this service for one year or as specified.
- D. Provide owner's representative with spare parts list. Identify equipment critical to maintaining the integrity of the operating system.

3.07 AS-BUILT DOCUMENTATION REQUIRED

- A. Prepare record documents of all field changes implemented during installation and functional testing.
- B. As-Built documentation shall be prepared in electronic format to be submitted as a pdf document.

3.08 TRAINING

- A. Provide application engineer to instruct owner in operation of systems and equipment.
- B. Provide system operator's training to include (but not be limited to) such items as the following: modification of data displays, alarm and status descriptors, requesting data, execution of commands and request of logs. Provide this training to a minimum of one person.
- C. Provide on-site training above as required, up to 4 hours as part of this contract.

3.09 DEMONSTRATION

- A. Demonstrate complete operating system to owner's representative.
- B. Provide certificate stating that control system has been tested and adjusted for proper operation.

END OF SECTION