UNIVERSITY OF LOUISIANA AT LAFAYETTE

Lafayette, Louisiana

FILE NO. 09064

PROPOSAL FOR FURNISHING

ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION, SUPERVISION, PERMITS, ETC. NECESSARY TO INSTALL A COMPLETE BUILDING CONTROL HVAC SYSTEM AT BUILDING 34 AT THE NEW IBERIA RESEARCH CENTER, LOCATED ON THE UL LAFAYETTE CAMPUS, NEW IBERIA, LOUISIANA

NOTE: A pre-bid meeting will be held at 9:30 AM on May 11, 2010 at New Iberia Research Center, Building 34 Conference Room, New Iberia, LA, at which time details of the specifications will be discussed.

Proposals will be received up to 2:00PM on May 26, 2010 by the Purchasing Office, University of Louisiana at Lafayette, Lafayette, Louisiana. Proposals will not be received after this specified hour and date. At this time, the proposals will be publicly opened and read in the Purchasing Office, Room 123, Martin Hall, 104 University Circle, on the University Campus.

This is a *Competitive Sealed Bid;* bids SHALL be submitted in a sealed envelope. Complete details for submitting bid, etc. are contained in the attached INSTRUCTIONS TO BIDDERS.

Bid must be received by the due date and time in the Purchasing Office at the University of Louisiana at Lafayette, 104 University Circle, Martin Hall, Room 123, Lafayette, LA, 70503. Bid is to be in a SEALED ENVELOPE with the BID NUMBER and DUE DATE ON THE OUTSIDE OF THE ENVELOPE.

All inquiries regarding this request shall be directed to:

Ms. Roxanne Jones-Jenkins
New Iberia Research Center
UL Lafayette, New Iberia, LA
(337) 482-0301

TO: **University of Louisiana at Lafayette**
Purchasing Office, Martin Hall Room 123
104 University Circle
P O Box 40197
Lafayette LA 70504 0197
Fax – 337-482-5059

To Whom It May Concern:

Attached is the completed proposal of the firm listed below. The undersigned certifies that he/she (or they) has/have carefully examined *the Instructions to Bidders, the General Conditions, and the Specifications* hereto attached and made part herein, and agrees to comply with the instructions, conditions, and specifications, as covered by the attached papers. On the basis of the specifications, the undersigned proposes to furnish any or all items listed in the schedule of items hereto attached, upon which prices are requested, and at the price stated for each item.

Firm Name	**Signature** [By signing this bid, bidder certifies compliance with La. R.S. 38:2212(A)(1)(c) or RS 38:2212(0)]
Address	**Name (Printed)**
City, State, Zip Code	**Title**
Telephone No. including area code	**Date**
Fax No. including area code	**LOUISIANA CONTRACTOR'S NO.**

INSTRUCTIONS TO BIDDERS
AND
GENERAL CONDITIONS

1. SUBMITTAL OF PROPOSALS: The bidder must submit his/her proposal on the form herein provided. The proposal must be signed in ink with, with the blank space(s), filled in for each and every item. The bidder must state the UNIT price (written in ink or typewritten) for which he/she proposes to furnish each item and shall show the total amount for each item based on the quantities shown. E-mail, telephone and telegraphic quotations WILL NOT be accepted.

Each change or correction must be clearly marked and initialed by bidder. Failure to comply with these requirements may cause your bid to be disqualified.

The proposal shall be submitted in a sealed envelope with the due date and file no clearly written on the exterior. The envelope shall then be sealed and delivered to the Purchasing Office, University of Louisiana at Lafayette, Lafayette, Louisiana, before the time set for receiving proposals as entered on the front sheet hereof. Any envelope, any sample or package, etc. should refer to the File No. and Due Date.

Proposal received after the time set will be returned to the bidder unopened.

Proposal may be rejected for additions, conditions, or alternate bids, not called for, for incomplete bids, or for failure to comply with requirements set forth.

No bids may be withdrawn after opening date and hour shown on cover sheet and quoted prices shall be firm for a minimum of thirty (30) days unless otherwise specified by the University or the bidder.

2. SPECIFICATIONS: Wherever standard Louisiana specifications are specified in any quotation, all bidders must comply with these specifications. Specifications other than standard specifications are to be considered as setting a standard of quality suitable to permit competition and to coincide as far as possible with commercial standards of goods generally sold on the market.

Bidder must specify the brand and model number of the product offered in his/her bid. Bids not specifying brand and model number shall be considered as offering the exact product specified.

Bidder proposing an equivalent brand or model should submit with the bid information (such as illustrations, descriptive literature, technical data) sufficient for the University to evaluate quality, suitability, and compliance with the specifications of the bid. Failure to submit such information may cause bid to be rejected.

3. BID OPENING: Bidders may attend the bid opening, but no information or opinions concerning the ultimate contract award will be given at the bid opening or during the evaluation process. Bids may be examined seventy-two (72) hours after request is made. Information pertaining to completed files may be secured by visit the University Purchasing Office during normal working hours.

A complete record of all bids is kept on file in this office subject to the inspection of any citizen. Every courtesy will be afforded any citizen who is interested in investigating, for any purpose, the record(s) of University of Louisiana at Lafayette purchases.

4. AWARD OF CONTRACT: The award of all contracts will be made in conformity with the requirements of the State Statute. The contract shall be awarded with reasonable promptness by written notice to the lowest responsive and responsible bidder whose bid meets the requirements and criteria set forth in the proposals.

The University of Louisiana at Lafayette reserves the right to reject any and all bids.

-continued-

Page 2, Instructions to Bidders and General Conditions

The University assumes the right to increase, reduce, or completely eliminate entire item or items from the quotation after an analysis of the bids. The University also reserves the right to award this proposal on an individual item basis, a combination of items basis, or as a total package to one (1) vendor, whichever is in the best interest of the University.

5. TERMS: Unless otherwise specified by the University in the proposal, bid prices must be complete, including transportation, prepaid by bidder to destination. Bids other than FOB destination may be rejected.

Not withstanding bid response, terms of payment shall be at least "Net 30 Days". Discounts offered for payment in less than thirty (30) days WILL NOT be considered in making an award. On open-ended requirement contracts, discounts will be accepted, but WILL NOT be considered in making an award. Bids containing "payment in advance" or "COD" requirements may be rejected.

6. EQUAL EMPLOYMENT: Contractor agrees not to discriminate in its employment practices, and will render services under this contract without regard to race, color, religion, sex, national origin, veteran status, political affiliation, disabilities or because of an individual's sexual orientation.

7. INSURANCE: The contractor shall carry and maintain Workmen's Compensation and Public Liability and Property Damage Insurance in accordance with the statutes and laws of the State of Louisiana, and he/she shall furnish the Owner with satisfactory proof of carriage of the insurance required.

8. DEBRIS, CLEANING UP, ETC: The contractor as directed by the Owner during the progress of the work shall remove all resultant dirt and debris and shall properly dispose of same. Upon completion of the service, he/she shall remove all equipment, unused material and debris and shall leave the premises in a clean and first-class condition.

9. ASBESTOS: No new material or product may be installed on this project which contains ANY amount of asbestos material. This statement takes precedence over any other product or material specification within these bid documents.

10. PAYMENTS: When a contract is in place final payment on account of this agreement will not be made until the expiration of forty-five (45) days following recordation of a Certificate of Substantial Completion and Resolution of Acceptance in the Office of the Clerk of Court, as required by State Statutes, and after such period said final payment will be made upon receipt by the Owner of a certificate from the Office of the Clerk of Court to the effect that no labor or material liens have been filed against the work.

11. CANCELLATION OF CONTRACT: The University has the right to cancel any contract, in accordance with Purchasing Rules and Regulations, for cause, including but not limited to the following: (1) Failure to deliver within the time specified in the contract; (2) Failure of the product or service to meet specifications, conform to sample quality or to be delivered in good condition; (3) Misrepresentation by the Contractor; (4) Fraud, collusion, conspiracy or other unlawful means of obtaining any contract with the state; (5) Conflict of contract provisions with constitutional or statutory provisions of state or federal law; (6) Any other breach of contract.

12. SIGNATURE AUTHORITY: In accordance with L.R.S.38:2212 (A)(1)(C) or 38:2212(O), the person signing the bid must be:

A. A current corporate officer, partnership member or other individual specifically authorized to submit a bid as reflected in the appropriate records on file with the Secretary of State; or
B. An individual authorized to bind the vendor as reflected by an accompanying corporate resolution, certificate or affidavit.

By signing the bid, the bidder certifies compliance with the above.

-continued-

FURNISH ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION, SUPERVISION, PERMITS, ETC. NECESSARY TO INSTALL A COMPLETE BUILDING CONTROL HVAC SYSTEM AT BUILDING 34 AT THE NEW IBERIA RESEARCH CENTER, LOCATED ON THE UNIVERSITY OF LOUISIANA AT LAFAYETTE CAMPUS, NEW IBERIA, LOUISIANA, AS SHOWN ON THESE SPECIFICATIONS.....

SCOPE OF WORK

1) Install new DDC control system and all related accessories as per the following specifications in Building 34 at the New Iberia Research Center.

DUE TO THE IMPORTANCE OF THE SCHEDULE, LIQUIDATED DAMAGES IN THE AMOUNT OF ONE HUNDRED DOLLARS ($100.00) PER DAY WILL BE ASSESSED FOR EVERY CALENDAR DAY THAT THIS PROJECT IS NOT COMPLETE BEYOND ONE HUNDRED TWENTY (120) CALENDAR DAYS OF THE NOTICE TO PROCEED.

Each bidder MUST accompany his/her proposal with a bid security for five percent (5%) of the total maximum amount of his/her bid. The bid security shall be drawn in favor of the University of Louisiana at Lafayette and SHALL be in the form of a Bid Bond (Insurance Company), Bank Money Order, Certified Check or Cashier's Check. It shall become the property of the Owner in the event the contract and any performance bond are not executed within the time set forth. Bid bond shall be written by a surety or insurance company currently on the US Department of the Treasury Financial Management Service List of Approved Bonding Companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an "A-" Rating in the latest printing of the AM Best's Key Rating Guide to write individual bonds up to ten percent (10%) of policyholders' surplus as shown in the AM Best's Key Rating Guide.

Successful bidder WILL BE required to execute and deliver within ten (10) days of notification, a satisfactory performance bond and payment bond in the amount of one hundred percent (100%) of the contract price. Performance Bond, with Power of Attorney, shall be secured by a surety or insurance company currently on the US Department of the Treasury Financial Management Service List of Approved Bonding Companies, and in accordance with restrictions set by them or by an insurance company that is either domiciled in Louisiana or owned by Louisiana residents and is licensed to write surety bonds. In addition, any surety bond written for a public works project shall be written by a surety or insurance company that is currently licensed to do business in the State of Louisiana. Also, to be provided at the same time is a Labor and Materials payment Bond in an amount equal to one hundred percent (100%) of the contract amount.

Contractors or contracting firms submitting bids in the amount of $10,000.00 or more shall show their license number on the front of the sealed envelope in which their bid is enclosed. Bids in the amount of $10,000.00 or more, not submitted in accordance with this requirement, shall be rejected and shall not be read. (Revised dollar amount according to ACT 725.) Bids shall be accepted from Contractors who are licensed under L.A. R.S. 37:2150-2163 in a classification such as: **Mechanical Work**. Additional information relative to licensing may be obtained from the Louisiana State Licensing Board for Contractors, Baton Rouge, Louisiana.

In making this bid, each bidder represents that: They have read and understand the bid documents and the bid is made in accordance herewith, and the bid is based upon the specifications described in the bid documents without exception.

-continued-

It is the responsibility of the prospective bidder to visit and examine jobsite, take measurements to his/her own satisfaction and determine conditions under which work is to be done. Owner will not accept responsibility for conditions which careful examination of premises would have shown existed.

To visit jobsite and for further information, prospective bidder is to contact Ms. Roxanne Jones-Jenkins, 337-482-0301.

A pre-bid meeting will be held at 9:30am on March 23, 2010 at Ackal Hall Auditorium, New Iberia Research Center, New Iberia, LA, at which time details of plans and specifications will be discussed.

GENERAL SPECIFICATIONS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

This contract shall be governed by AIA Document A201 - General Conditions of the Contract for Construction, Fourteenth Edition, 1987. Contractors may review an original document on file in the UL Lafayette Physical Plant Office, or may write the American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006, to purchase an original A201 Document.

GENERAL REQUIREMENTS

The Contractor shall furnish and install all labor and material necessary to provide and install the complete portion of this contract, including all materials and equipment as shown on the plans. It is the intention of these specifications that all systems be furnished complete with whatever necessary items are required to produce a satisfactory installation in a working order. The Contractor shall be responsible for bringing to the attention of the Owner any shortcomings of the design, or thereby, shall be responsible in full to meet the conditions set forth, that being, the system is to be in a satisfactory working order.

All material shall be installed in accordance with the instructions of the manufacturers. The work shall be done in strict compliance with state and local ordinances governing this class of work. The prospective bidder shall visit the job site and become familiar with all existing conditions found at the site. The Contractor shall become acquainted with all existing factors and conditions which affect the work. Failure to do so shall not relieve meeting the responsibility to install the work correctly.

The Contractor shall protect the entire installation from injury on the project until final acceptance. Failure to do so shall be sufficient cause for the Agent to reject any work.

DEFINITIONS

Agent - The University's representative in the New Iberia Research Center who is referred to throughout these documents as singular in number.

Contractor - The person who contracts with UL Lafayette to perform the work as called for on these documents who is referred to as singular in number.

-continued-

Owner - The University of Louisiana at Lafayette (UL Lafayette)

CONSTRUCTION FORCE
The Contractor shall provide and maintain in full operation at all times during the performance of the contract a sufficient work crew to execute the work with dispatch. The Contractor shall provide a full time superintendent who shall be on the job during all working periods.

The Contractor shall be responsible for maintenance and repair of all equipment installed by him which fails due to substandard workmanship.

APPROVALS FOR CHANGE
At no time shall the Contractor deviate from the intent of the drawings or these specifications unless these deviations are approved in writing by the Agent. All substitutions must be received by the agent at least seven (7) working days prior to the date for the receipt of bids. Each request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including model numbers, drawings, cut sheets, performance and test data, and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. It shall be the responsibility of the proposer to include in his proposal all changes required of the contract documents if the proposed product is used. Prior approval is given contingent upon supplier being responsible for any costs which may be necessary to modify the space or facilities needed to accommodate the materials and equipment approved.

FAMILIARITY WITH CONDITIONS
Prior to the submission of the bid proposal, the Prospective Bidder shall make and shall be deemed to have made a careful examination of the project site, the plans, and specifications. The Prospective Bidder shall become informed as to the location and nature of the proposed construction, the kind and character of terrain to be encountered, the kind of facilities required before and during the construction of the project, general local conditions and all other matters that may affect the cost and the time of completion of the project.

CODES AND PERMITS
Said work shall comply with all local codes and ordinances.

DEQ NOTIFICATION
The Contractor shall be responsible for the proper notification of the Department of Environmental Quality whenever demolition work is to be performed. Copies of the DEQ Notification Form AAC-2 and any additional correspondence with DEQ shall be copied to the University.

STANDARDS
All materials furnished under this contract shall be designed, constructed and rated in accordance with the latest applicable standards, and shall pass tests as recommended therein.

WORKMANSHIP AND MATERIALS
The workmanship shall conform to the best accepted construction practice. Should it become evident that during the course of construction that the items indicated on the plans, are for any reason undesirable, the Contractor shall

-continued-

immediately bring the situation to the attention of the Agent for a decision. The Contractor shall be responsible for installing the proper materials as described by the drawings and specifications.

All materials furnished for this project shall be new, undamaged, and bear the label of the Underwriters' Laboratories, Inc. Deliver materials in manufacturer's original package and store on skids so that the materials are off the ground, and so that product labels are exposed for easy inspection.

The Bidder shall base the proposal on materials herein specified. Reference to specific manufacturers or trade names is not intended to limit or indicate preference to specific manufacturers, but to indicate a standard of quality. Written approval from the Agent is required on all substitutions prior to installations.

GUARANTEE

The Contractor shall guarantee new materials and workmanship for a minimum of one (1) full year after formal acceptance of the project. The Contractor will replace defective material and repair all workmanship defects promptly, and absorb all costs.

This provision shall not override any other warranties that are specified herein.

PRIOR APPROVALS

The Contractor is required to install the exact materials specified in these documents, unless prior approval is given from the agent. Contractors requesting prior approval on an item must submit product information for evaluation to the agent at least seven (7) working days prior to the bid opening. Products submitted less than seven (7) working days prior to the bid opening will not be considered for prior approval.

SUBMITTALS

The Contractor shall submit samples of the materials called for in the section titled "Detailed Specifications". The Agent's approval of samples shall not relieve the Contractor from the responsibility of incorrectly figured dimensions or any other errors that may be contained in these drawings. The omission from the samples, or specifications, even though approved by the Agent, shall not relieve the Contractor from furnishing and erecting same.

The contractor shall be responsible to meet specifications, and the intent of the specifications. Deviation from the specifications in any form, whether reviewed by the Agent in the shop drawings or not, shall imply the Contractor is intending to present a substitution to the materials specified. The Contractor shall give specific written notice of each variation that the shop drawings may have from the requirements of the specifications, and, in addition, shall cause a specific notation (in a very clear manner) to be made on each shop drawing for review of each variation.

CAMPUS SAFETY POLICY

Contractor shall adhere to the campus safety policy. Information regarding campus safety can be found on the UL Lafayette website at: http://www.louisiana.edu/ehs

LOUISIANA ONE CALL

UL Lafayette is a member in the Louisiana One Call system. At least 72 hours before digging anywhere on UL Lafayette property the contractor **must** call 1-800-272-3020 to verify the location of utilities.

-continued-

EXISTING LANDSCAPING
Contractor is liable for any damages caused to the existing landscaping. All landscaping must be protected from root compaction and other physical damage. Contractor **must** provide three foot high orange construction fencing around the drip line of all trees within the construction site.

ASBESTOS
The contractor **will not** be required to interface with any asbestos containing material (ACM) during this project. The State of Louisiana has conducted an asbestos survey of all buildings on the UL Lafayette campus. The results of the survey are compiled in management plans for each building. The management plans were assembled according to the requirements set forth in the Department of Environmental Quality Required Elements Index. These plans are available for review to anyone interested in the results. The plans are kept on file in the Reserve Reading Room of Edith Garland Dupre' Library.

COORDINATION OF WORK
The Contractor shall inform the Agent each day of his work location before proceeding to work, and each time the Contractor moves into a different area.

PAYMENT
The Contractor may invoice the Owner for work performed on a monthly basis. The work performed shall meet the approval of UL Lafayette. UL Lafayette shall process payment after verification of the invoice.

On projects where a performance bond is specified, the University will withhold ten percent (10%) retainage from all payments for completed work. The retainage will be released to the contractor according to the procedures set forth in the "INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS", section 10.

FINAL PAYMENT WILL NOT BE ISSUED UNTIL ALL UNIVERSITY KEYS HAVE BEEN RETURNED TO THE AGENT.

CLEAN-UP
The Contractor is responsible for the clean-up and disposal of all trash and construction debris relating to this project. University dumpsters shall **not** be used for the disposal of debris. Should the Contractor dispose of any debris into University facilities, the cost of removal will be deducted from the University's final payment under this contract.

INSURANCE
The Contractor shall carry and maintain Workmen's Compensation and Public Liability and Property Damage Insurance in accordance with the statutes and laws of the State of Louisiana, and he/she shall furnish the Owner with satisfactory proof of carriage of the insurance required.

INDEMNIFICATION
The Contractor will indemnify and hold harmless the Owner and all of their agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from operations under the Contract Documents by the Contractor, and subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, which are caused in whole or in part by any error,

-continued-

omission, or act of any of them. If any and all claims against the Owner or any of their agents or employees by any employee of the Contractor, subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation of the Contractor under this article shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under Workmen's Compensation laws.

SAFETY

The Contractor, its agents and employees shall practice safe work habits, make safe use of chemicals, and handle safety equipment utilized in the performance of this Contract. Additionally, the Contractor shall use equipment, signs, barriers, or other devices to protect persons or property, and shall avoid the usage of hazardous materials that are not essential to the performance of the work.

USE OF OWNERS FACILITIES

The Contractor, its agents and employees shall have the right to use only those facilities of the Owner that are necessary to perform services under the Contract and shall have no right of access to any other facility of the Owner.

PUBLICITY

The Contractor shall not in any way or in any form publicize or advertise in any manner the fact that the Contractor is providing services to the Owner without expressed written approval of the Owner for each item of advertising of publicity. However, nothing herein shall preclude the Contractor from listing the Owner on its routine client list for matters of reference.

UTILITY SERVICES

The Owner shall provide, at the Owner's expense, electric power and domestic cold water at existing outlets for the convenience of the Contractor.

INDEPENDENT CONTRACTOR

All of the Contractor's employees furnishing or performing services under this Contract shall be deemed employees solely of the Contractor and shall not be deemed for any purposes whatsoever employees or agents of, acting for or on behalf of, the Owner. The Contractor shall perform all services as an independent Contractor and shall discharge all its liabilities as such. No acts performed or representations made, whether oral or written, by the Contractor with respect to third parties shall be binding on the Owner.

DETAILED SPECIFICATIONS

It is the intent of this specification to secure the installation of a complete Building Control System at Building 34, Ackal Hall. Control and monitoring shall be conducted across the Apogee® Building Automation System network software installed on the facility server located in Building 34, currently controlling Buildings 52 and 53. All finished equipment shall be new and of current production by a national firm that manufactures and assembles Direct Digital Control (DDC) systems. The system shall utilize electronic monitoring and control and the existing pneumatic actuators and control valves throughout the system in a complete and coordinated system. In addition, all components shall be of the latest commercial design, complete with all of the necessary accessories and tested both during design verification and following production at the manufacturing facility.

-continued-

Direct Digital Control system, utilizing electronic monitoring and controlled by the central computer across the existing Siemens network, shall sequence equipment on an as needed basis. The DDC system will incorporate existing pneumatic actuators and control valves throughout the system.

GENERAL SCOPE

Includes:
New DDC control system (see below)
New DDC VAV box controls
Upgrade existing Apogee software
Upgrade existing InfoCenter software
Integrate new system into existing network system
New Control sensors
Commissioning new system and mapping all points into info center
New graphic generation
Client software license

Excludes:
Validation of Critical points
New SOP's
Replace ceiling tiles and grid
All painting and patching

Components found to be degraded beyond operational limits shall be reported to the Agent for consideration of replacement on case-by-case basis. The following points will be available for monitoring and control on the system:

CONTROL POINTS

Point Name	DO	DI	AO	AI
Air Handling Unit				
Fan Start / Stop	X			
Fan Status		X		
Return Air Temp				X
Mixed Air Temp				X
Supply Air Temp				X
Outside Air Damper			X	
CW Valve			X	
HW Valve			X	
Static pressure				X
Chiller				

-continued-

Chiller Integration				
Chiller Start Stop	X			
Chiller Status		X		
Chiller Alarm		X		
CW Supply temp				X
CW Return Temp				X
CW Pump Start Stop	X			
CW Pump Status		X		
Boilers				
Boiler Start Stop	X			
Boiler Status		X		
Boiler Alarm		X		
HW Supply temp				X
HW Return Temp				X
HW Pump Start Stop	X			
HW pump Status		X		
VAV Boxes / Reheat coils				
Room Temp Sensors				X
Duct Temp Sensors				X
Room Set point				X
Night Override		X		
HW Valve			X	
Volume Damper			X	
Miscellaneous				
Ex Fan Start / Stop	X			
Ex Fan Status		X		
Restroom EX Fan Status		X		
Air Compressor Press Switch		X		

PART 1 – SPECIFICATION

1.1 SCOPE OF WORK

A. The Building Automation System (BAS) manufacturer shall furnish and install a fully integrated building automation system, incorporating direct digital control (DDC) for energy management, equipment monitoring and control, and subsystems with open communications capabilities as herein specified. The system shall be an extension of the currently installed Siemens Building Technologies Apogee system.

-continued-

B. The installation of the control system shall be performed under the direct supervision of the controls manufacturer with the bill of materials, component designation or identification number and sequence of operation all bearing the name of the manufacturer. The installing manufacturer shall certify in writing that the equipment manufacturer has supervised their installation and that all temperature control equipment was installed under their direct supervision.

C. All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed specially for this project. All systems and components shall have been thoroughly tested and proven in actual use for at least two years.

D. BAS manufacturer shall be responsible for all BAS and Temperature Control wiring for a complete and operable system. All wiring shall be done in accordance with all local and national codes.

1.2 WORK BY OTHERS

A. Mechanical Contractor installs all wells, valves, taps, dampers, flow stations, etc. furnished by BAS manufacturer as needed.

B. Electrical Contractor provides:
   1. 120VAC power to all BAS and/or Temperature control panels.

   2. Wiring of all power feeds through all disconnect starters to electrical motors.

   3. Wiring of any remote start/stop switches and manual or automatic motor speed control devices not furnished by BAS manufacturer.

   4. Wiring of any electrical sub-metering devices furnished by BAS manufacturer.

C. Products furnished but not installed under this section
   1. Hydronic Piping:
      a. Control Valves
      b. Flow Switches
      c. Temperature Sensor Wells and Sockets
      d. Flow Meters

   2. Refrigerant Piping:
      a. Pressure and Temperature Sensor Wells and Sockets

   3. Duct-work Accessories:
      a. Automatic Dampers
      b. Air-flow Stations
      c. Terminal Unit Controls

-continued-

D. Products installed but not furnished under this section

1. Refrigeration Equipment:
   a. Pressure Transmitters
   b. Temperature Transmitters
   c. Power Transmitters
   d .Refrigerant Leak Detectors

2. Air Handling Equipment:
   a. Thermostats
   b. Sensors
   c. Controllers

3. Fire Alarm Systems
   a. Smoke Detectors

1.3 QUALITY ASSURANCE

A. The BAS system shall be designed, installed, commissioned and serviced by manufacturer employed, factory trained personnel. Manufacturer shall have an in-place support facility within 100 miles of the site with technical staff, spare parts inventory and necessary test and diagnostic equipment. Distributors or licensed installing contractors are not acceptable.

The manufacturer shall provide a full time, on site, experienced project manager for this work, responsible for direct supervision of the design, installation, start-up and commissioning of the B.M.S.

The Bidder shall be regularly engaged in the manufacturing, installation and maintenance of BMS systems and shall have a minimum of ten (10) years of demonstrated technical expertise and experience in the manufacture, installation and maintenance of B.M.S. systems similar in size and complexity to this project. A maintained service organization consisting of at least ten (10) competent servicemen for a period of not less than ten years and provide a list of 10 projects, similar in size and scope to this project, completed within the last five years.

B. Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and 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 under Standard UL 916, category PAZX; Standard ULC C100, category UUKL7; and under Standard UL 864, categories UUKL, UDTZ, and QVAX, and be so listed at the time of bid. All floor level controllers shall comply, at a minimum, with UL Standard UL 916 category PAZX; Standard UL 864, categories UDTZ, and QVAX, and be so listed at the time of Bid.

-continued-

D. The BAS peer-to-peer network controllers and local user display shall also comply with the Australian Electromagnetic Compatibility (EMC) Framework, and bear the C-Tic Mark to show compliance. The purpose of the regulation is to minimize electromagnetic interference between electronic products, which may diminish the performance of electrical products or disrupt essential communications.

E. DDC peer-to-peer controllers shall be compliant with the European EMC Directive, Standards EN 50081-2 and EN 50082-2, at the Industrial Levels. Additionally the equipment shall be compliant with the European LVD Directive and bear the CE mark in order to show compliance to both Directives."

F. All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.

G. The manufacturer of the building automation system shall provide documentation supporting compliance with ISO-9002 (Model for Quality Assurance in Production, Installation, and Servicing) and ISO-140001 (The application of well-accepted business management principles to the environment). The intent of this specification requirement is to ensure that the products from the manufacturer are delivered through a Quality System and Framework that will assure consistency in the products delivered for this project.

H. This system shall have a documented history of compatibility by design for a minimum of 15 years. Future compatibility shall be supported for no less than 10 years. Compatibility shall be defined as the ability to upgrade existing field panels to current level of technology, and extend new field panels on a previously installed network.

Compatibility shall be defined as the ability for any existing field panel microprocessor to be connected and directly communicate with new field panels without bridges, routers or protocol converters.

1. 5 SUBMITTALS

A. Submit 10 complete sets of documentation in the following phased delivery schedule:

1. Valve and damper schedules
2. Equipment data cut sheets
3. System schematics, including:
   - sequence of operations
   - point names
   - point addresses
   - interface wiring diagrams
   - panel layouts.
   - system riser diagrams
4. Auto-CAD compatible as-built drawings

-continued-

B. Upon project completion, submit operation and maintenance manuals, consisting of the following:

Index sheet, listing contents in alphabetical order
Manufacturer's equipment parts list of all functional components of the System
Auto-CAD disk of system schematics, including wiring diagrams
Description of sequence of operations
As-Built interconnection wiring diagrams
Operator's Manual
Trunk cable schematic showing remote electronic panel locations, and all trunk data
List of connected data points, including panels to which they are connected and input device (ionization detector, sensors, etc.)
Conduit routing diagrams

1.6 WARRANTY

A. Provide all services, materials and equipment necessary for the successful operation of the entire BAS system for a period of one year after beneficial use.

B. The adjustment, required testing, and repair of the system includes all computer equipment, transmission equipment and all sensors and control devices.

C. The on-line support services shall allow the local BAS subcontractor to dial out over telephone lines to monitor and control the facility's building automation system. This remote connection to the facility shall be within 2 hours of the time that the problem is reported. This coverage shall be extended to include normal business hours, after business hours, weekends and holidays.

If the local office cannot resolve the problem on-line, the national office of the building automation system manufacturer shall have the same capabilities for remote connection to the facility. If the problem cannot be resolved with on-line support services, the BAS manufacturer shall dispatch the appropriate personnel to the job site to resolve the problem within 3 hours of the time that the problem is reported.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Siemens Building Technologies, Inc. Apogee system

2.2 NETWORKING COMMUNICATIONS

A. The design of the BAS shall network operator workstations and stand-alone DDC Controllers. The network architecture shall consist of multiple levels for communication efficiency, a campus-wide (Management Level Network) Ethernet network based on TCP/IP protocol, high performance

-continued-

peer-to-peer building level network(s) and DDC Controller floor level local area networks with access being totally transparent to the user when accessing data or developing control programs.

B. The design of BAS shall allow the co-existence of new DDC Controllers with existing DDC Controllers in the same network without the use of gateways or protocol converters.

1. System shall have the capability to communicate with a BACnet network over Ethernet or BACnet/IP (according to Annex J). The intent is to use the system provided under this contract to communicate with control systems provided by other vendors. A Platform for Internet Content Selection (PICS) must be provided describing the BACnet, ANSI/ASHRAE 135-95, implementation. Minimum system functionality must include Client software licensing for all monitoring, commanding, and alarming for daily operator functions from two simultaneous common workstations.

2. System shall have the capability to be an OPC Client and Server for dynamic communication with OPC Clients or Servers over an Ethernet network. At a minimum, the following must be supported:

a. Data Access 1.0 (96), 1.0A (97) and 2.0 (11/98)

b. Alarms & Events 1.0 (1/99)

C. Peer-to-Peer Building Level Network:

1. All operator devices either network resident or connected via dial-up modems shall have the ability to access all point status and application report data or execute control functions for any and all other devices via the peer-to-peer network. No hardware or software limits shall be imposed on the number of devices with global access to the network data at any time.

2. The peer-to-peer network shall support a minimum of 100 DDC controllers and PC workstations.

3. Each PC workstation shall support a minimum of 4 peer-to-peer networks hardwired or dial up.

4. The system shall support integration of third party systems (fire alarm, security, lighting, PCL, chiller, boiler) via panel mounted open protocol processor. This processor shall exchange data between the two systems for interprocess control. All exchange points shall have full system functionality as specified herein for hardwired points.

5. Field panels must be capable of integration with open standards including Modbus, BACnet, and Lonworks as well as with third party devices via existing vendor protocols.

2.3 DDC CONTROLLER FLOOR LEVEL NETWORK:

A. This level communication shall support a family of application specific controllers and shall communicate with the peer-to-peer network through DDC Controllers for transmission of global data.

-continued-

2.4 DDC & HVAC MECHANICAL EQUIPMENT CONTROLLERS

A. The DDC & HVAC Mechanical Equipment Controllers shall reside on the Building Level Network.

B. DDC & HVAC Mechanical Equipment Controllers should use the same programming language and tools. DDC & HVAC Mechanical Equipment Controllers, which require different programming language or tools on a network, are not acceptable.

C. DDC & HVAC Mechanical Equipment Controllers which do not meet the functions specified in Section 2.4.1 and Section 2.5 for DDC Controllers or Section 2.4.2 and Section 2.5 for HVAC Mechanical Equipment Controllers are not acceptable.

2.4.1 DDC CONTROLLER

A. DDC Controllers shall be 16-bit stand-alone, multi-tasking, multi-user, real-time digital control processors consisting of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules. Controller size shall be sufficient to fully meet the requirements of this specification and the attached point I/O schedule. Each controller shall support a minimum of three (3) Floor Level Application Specific Controller Device Networks.

B. Each DDC Controller shall have sufficient memory to support its own operating system and databases, including:

1. Control processes
2. Energy management applications
3. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
4. Historical/trend data for points specified
5. Maintenance support applications
6. Custom processes
7. Operator I/O
8. Dial-up communications
9. Manual override monitoring

C. Each DDC Controller shall support firmware upgrades without the need to replace hardware.

D. Provide all processors, power supplies and communication controllers so that the implementation of a point only requires the addition of the appropriate point input/output termination module and wiring.

E. DDC Controllers shall provide a RS-232C serial data communication ports for operation of operator I/O devices such as industry standard printers, operator terminals, modems and portable laptop operator's terminals. DDC Controllers shall allow temporary use of portable devices without interrupting the normal operation of permanently connected modems, printers or terminals.

-continued-

F. As indicated in the point I/O schedule, the operator shall have the ability to manually override automatic or centrally executed commands at the DDC Controller via local, point discrete, on-board hand/off/auto operator override switches for digital control type points and gradual switches for analog control type points.

1. Switches shall be mounted either within the DDC Controllers key-accessed enclosure, or externally mounted with each switch keyed to prevent unauthorized overrides.

2. DDC Controllers shall monitor the status of all overrides and inform the operator that automatic control has been inhibited. DDC Controllers shall also collect override activity information for reports.

G. DDC Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device. Graduated intensity LEDs or analog indication of value shall also be provided for each analog output. Status indication shall be visible without opening the panel door.

H. Each DDC Controller shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all panel components. The DDC Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication.

I. Isolation shall be provided at all peer-to-peer network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:

1. RF-Conducted Immunity (RFCI) per ENV 50141 (IEC 1000-4-6) at 3 V

2. Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact

3. Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500 V signal, 1 kV power

4. Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)

5. Isolation shall be provided at all peer-to-peer panel's AC input terminals to suppress induced voltage transients consistent with:

a. IEEE Standard 587-1980

b. UL 864 Supply Line Transients

c. Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)

-continued-

J. In the event of the loss of normal power, there shall be an orderly shutdown of all DDC Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration data and battery backup shall be provided to support the real-time clock and all volatile memory for a minimum of 60 days.

1. Upon restoration of normal power, the DDC Controller shall automatically resume full operation without manual intervention.

2. Should DDC Controller memory be lost for any reason, the user shall have the capability of reloading the DDC Controller via the local RS-232C port, via telephone line dial-in or from a network workstation PC.

K. Provide a separate DDC Controller for each AHU or other HVAC system as indicated in Section 3.02. It is intended that each unique system be provided with its own point resident DDC Controller.

2.4.2 HVAC MECHANICAL EQUIPMENT CONTROLLERS

A. HVAC Mechanical Equipment Controllers shall be 12-bit stand-alone, multi-tasking, multi-user, real-time digital control processors consisting of modular hardware with plug-in enclosed processors.

B. Each HVAC Mechanical Controller shall have sufficient memory to support its own operating system and databases, including:
1. Control processes
2. Energy management applications
3. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
4. Historical/trend data for points specified
5. Maintenance support applications
6. Custom processes
7. Operator I/O
8. Remote communications

C. HVAC Mechanical Equipment Controllers shall provide a RS-232C serial data communication port for operation of operator I/O devices such as industry standard printers, operator terminals, modems and portable laptop operator's terminals.

D. HVAC Mechanical Equipment Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device.

E. Each HVAC Mechanical Equipment Controller shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all components. The HVAC Mechanical Equipment Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication.

-continued-

F. Isolation shall be provided at all peer-to-peer network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:
- RF-Conducted Immunity (RFCI) per ENV 50141 (IEC 1000-4-6) at 3 V
- Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact
- Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500 V signal, 1 kV power
- Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)

Isolation shall be provided at all peer-to-peer panel's AC input terminals to suppress induced voltage transients consistent with:
- IEEE Standard 587-1980
- UL 864 Supply Line Transients
- Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)

G. In the event of the loss of normal power, there shall be an orderly shutdown of all HVAC Mechanical Equipment Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration data and battery backup shall be provided to support the real-time clock and all volatile memory for a minimum of 72 hours.

1. Upon restoration of normal power, the HVAC Mechanical Equipment Controller shall automatically resume full operation without manual intervention.

2. Should HVAC Mechanical Equipment Controller memory be lost for any reason, the user shall have the capability of reloading the HVAC Mechanical Equipment Controller via the local RS-232C port, via telephone line dial-in or from a network workstation PC.

2.5 DDC & HVAC MECHANICAL EQUIPMENT CONTROLLER RESIDENT SOFTWARE FEATURES

A. General:

1. The software programs specified in this Section shall be provided as an integral part of DDC and HVAC Mechanical Equipment Controllers and shall not be dependent upon any higher-level computer for execution.

2. All points shall be identified by up to 30-character point name and 16-character point descriptor. The same names shall be used at the PC workstation.

3. All digital points shall have user defined two-state status indication (descriptors with a minimum of 8 characters allowed per state (i.e. summer/winter)).

-continued-

B. Control Software Description:

1. The DDC and HVAC Mechanical Equipment Controllers shall have the ability to perform the following pre-tested control algorithms:

   a. Two-position control
   b. Proportional control
   c. Proportional plus integral control
   d. Proportional, integral, plus derivative control
   e. Automatic tuning of control loops

C. DDC and HVAC Mechanical Equipment Controllers shall provide the following energy management routines for the purpose of optimizing energy consumption while maintaining occupant comfort.

1. Start-Stop Time Optimization (SSTO) shall automatically be coordinated with event scheduling. The SSTO program shall start HVAC equipment at the latest possible time that will allow the equipment to achieve the desired zone condition by time of occupancy. The SSTO program shall also shut down HVAC equipment at the earliest possible time before the end of the occupancy period, and still maintain desired comfort conditions.

   a) The SSTO program shall operate in both the heating and cooling seasons.

      1) It shall be possible to apply the SSTO program to individual fan systems.
      2) The SSTO program shall operate on both outside weather conditions as well as inside zone conditions and empirical factors.

   b) The SSTO program shall meet the local code requirements for minimum outside air while the building is occupied.

2. Event Scheduling: Provide a comprehensive menu driven program to automatically start and stop designated points or groups of points according to a stored time.

   a) It shall be possible to individually command a point or group of points.

   b) For points assigned to one common load group, it shall be possible to assign variable time delays between each successive start or stop within that group.

   c) The operator shall be able to define the following information:

      1. Time, day
      2. Commands such as on, off, auto, and so forth.
      3. Time delays between successive commands.
      4. There shall be provisions for manual overriding of each schedule by an appropriate operator.

-continued-

d) It shall be possible to schedule events up to one year in advance.

1. Scheduling shall be calendar based.
2. Holidays shall allow for different schedules.

3. Enthalpy switchover (economizer): The Energy Management Control Software (EMCS) will control the position of the air handler relief, return, and outside air dampers. If the outside air dry-bulb temperature falls below changeover set point the EMCS will modulate the dampers to provide 100 percent outside air. The user will be able to quickly changeover to an economizer system based on dry bulb temperature and will be able to override the economizer cycle and return to minimum outside air operation at any time.

4. Temperature-compensated duty cycling.

a) The DCCP (Duty Cycle Control Program) shall periodically stop and start loads according to various patterns.

b) The loads shall be cycled such that there is a net reduction in both the electrical demands and the energy consumed.

5. Automatic Daylight Savings Time Switchover: The system shall provide automatic time adjustment for switching to/from Daylight Savings Time.

6. Night setback control: The system shall provide the ability to automatically adjust setpoints for night control.

7. The Peak Demand Limiting (PDL) program shall limit the consumption of electricity to prevent electrical peak demand charges.

a) PDL shall continuously track the amount of electricity being consumed, by monitoring one or more electrical kilowatt-hour/demand meters. These meters may measure the electrical consumption (kWh), electrical demand (kW), or both.

b) PDL shall sample the meter data to continuously forecast the demand likely to be used during successive time intervals.

c) If the PDL forecasted demand indicates that electricity usage is likely to exceed a user preset maximum allowable level, then PDL shall automatically shed electrical loads.

d) Once the demand peak has passed, loads that have been shed shall be restored and returned to normal control.

D. DDC and HVAC Mechanical Equipment Controllers shall be able to execute custom, job-specific processes defined by the user, to automatically perform calculations and special control routines.

-continued-

1. A single process shall be able to incorporate measured or calculated data from any and all other DDC and HVAC Mechanical Equipment Controllers on the network. In addition, a single process shall be able to issue commands to points in any and all other DDC and HVAC Mechanical Equipment Controllers on the network. Database shall support 30 character, English language point names, structured for searching and logs.

2. Processes shall be able to generate operator messages and advisories to operator I/O devices. A process shall be able to directly send a message to a specified device or cause the execution of a dial-up connection to a remote device such as a printer or pager.

3. DDC and HVAC Mechanical Equipment Controller shall provide a HELP function key, providing enhanced context sensitive on-line help with task-orientated information from the user manual.

4. DDC and HVAC Mechanical Equipment Controller shall be capable of comment lines for sequence of operation explanation.

E. Alarm management shall be provided to monitor and direct alarm information to operator devices. Each DDC and HVAC Mechanical Equipment Controller shall perform distributed, independent alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, minimize network traffic and prevent alarms from being lost. At no time shall the DDC and HVAC Mechanical Equipment Controllers ability to report alarms be affected by either operator or activity at a PC workstation, local I/O device or communications with other panels on the network.

1. All alarm or point change reports shall include the point's English language description and the time and date of occurrence.

2. The user shall be able to define the specific system reaction for each point. Alarms shall be prioritized to minimize nuisance reporting and to speed operator response to critical alarms. A minimum of six priority levels shall be provided for each point. Point priority levels shall be combined with user definable destination categories (PC, printer, DDC Controller, etc.) to provide full flexibility in defining the handling of system alarms. Each DDC and HVAC Mechanical Equipment Controller shall automatically inhibit the reporting of selected alarms during system shutdown and start-up. Users shall have the ability to manually inhibit alarm reporting for each point.

3. Alarm reports and messages will be directed to a user-defined list of operator devices or PCs based on time (after hours destinations) or based on priority.

4. In addition to the point's descriptor and the time and date, the user shall be able to print, display or store a 200 character alarm message to more fully describe the alarm condition or direct operator response.

-continued-

5. In dial-up applications, operator-selected alarms shall initiate a call to a remote operator device.

F. A variety of historical data collection utilities shall be provided to manually or automatically sample, store and display system data for points as specified in the I/O summary.

1. Any point, physical or calculated may be designated for trending. Any point, regardless of physical location in the network, may be collected and stored in each DDC and HVAC Mechanical Equipment Controllers point group. Two methods of collection shall be allowed: either by a pre-defined time interval or upon a pre-defined change of value. Sample intervals of l minute to 7 days shall be provided. Each DDC and HVAC Mechanical Equipment Controller shall have a dedicated RAM-based buffer for trend data and shall be capable of storing a minimum of __ data samples. All trend data shall be available for transfer to a Workstation without manual intervention.

2. DDC and HVAC Mechanical Equipment Controllers shall also provide high resolution sampling capability for verification of control loop performance. Operator-initiated automatic and manual loop tuning algorithms shall be provided for operator-selected PID control loops as identified in the point I/O summary.

a. Loop tuning shall be capable of being initiated either locally at the DDC and HVAC Mechanical Equipment Controller, from a network workstation or remotely using dial-in modems. For all loop tuning functions, access shall be limited to authorized personnel through password protection.

G. DDC and HVAC Mechanical Equipment Controllers shall be capable of automatically accumulating and storing run-time hours for digital input and output points and automatically sample, calculate and store consumption totals for analog and digital pulse input type points, as specified in the point I/O schedule.

H. The peer-to-peer network shall allow the DDC and HVAC Mechanical Equipment Controllers to access any data from or send control commands and alarm reports directly to any other DDC and HVAC Mechanical Equipment Controller or combination of controllers on the network without dependence upon a central or intermediate processing device. DDC and HVAC Mechanical Equipment Controllers shall send alarm reports to multiple workstations without dependence upon a central or intermediate processing device. The peer to peer network shall also allow any DDC and HVAC Mechanical Equipment Controller to access, edit, modify, add, delete, back up, and restore all system point database and all programs.

I. The peer-to-peer network shall allow the DDC and HVAC Mechanical Equipment Controllers to assign a minimum of 50 passwords access and control priorities to each point individually. The logon password (at any PC workstation or portable operator terminal) shall enable the operator to monitor, adjust and control the points that the operator is authorized for. All other points shall not be displayed on the PC workstation or portable terminal (e.g. all base building and all tenant points shall be

-continued-

accessible to any base building operators, but only tenant points shall be accessible to tenant building operators). Passwords and priorities for every point shall be fully programmable and adjustable.

2.6 FLOOR LEVEL NETWORK APPLICATION SPECIFIC CONTROLLERS (ASC)

A. Each DDC Controller shall be able to extend its performance and capacity through the use of remote application specific controllers (ASCs) through Floor Level LAN Device Networks.

B. Each ASC shall operate as a stand-alone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC shall be a microprocessor-based, multi-tasking, real-time digital control processor. Each ASC shall be capable of control of the terminal device independent of the manufacturer of the terminal device.

C. Terminal Equipment Controllers:

1. Provide for control of each piece of equipment, including, but not limited to, the following:
   a. Variable Air Volume (VAV) boxes
   b. Constant Air Volume (CAV) boxes
   c. Dual Duct Terminal Boxes
   d. Unit Conditioners
   e. Heat Pumps
   f. Unit Ventilators
   g. Room Pressurization

2. Controllers shall include all point inputs and outputs necessary to perform the specified control sequences. Analog outputs shall be industry standard signals such as 24V floating control, 3-15 psi pneumatic, 0-10v, allowing for interface to a variety of modulating actuators.

3. All controller sequences and operation shall provide closed loop control of the intended application. Closing control loops over the FLN, BLN or MLN is not acceptable

2.11 FIELD DEVICES

A. Provide instrumentation as required for monitoring, control or optimization functions. All devices and equipment shall be approved for installation.

B. Room Temperature Sensors
   1) Digital room sensors shall have LCD display, day / night override button, and setpoint slide adjustment override options. The setpoint slide adjustment can be software limited by the automation system to limit the amount of room adjustment.

Temperature monitoring range	+20/120°F -13° to 49°C)
Output signal	Changing resistance
Accuracy at Calibration point	±0.5°F (+/- 0.3°C)
Set Point and Display Range	55° to 95° F (13° to 35°C)

-continued-

2) Liquid immersion temperature:

Temperature monitoring range	+30/250°F (-1°/121°C)
Output signal	Changing resistance
Accuracy at Calibration point	±0.5°F (+/-0.3°C)

3) Duct (single point) temperature:

Temperature monitoring range	+20/120°F (-7°/49°C)
Output signal	Changing resistance
Accuracy at Calibration point	±0.5°F (+/-0.3°C)

4) Duct Average temperature:

Temperature monitoring range	+20° ±120°F(-7°/+49°C)
Output signal	4 – 20 mA DC
Accuracy at Calibration point	±0.5°F (±03°C)
Sensor Probe Length	25’ L (7.3m)

5) Outside air temperature:

Temperature monitoring range	-58°±122° F(-50ºC to +50ºC)
Output signal	4 – 20 mA DC
Accuracy at Calibration point	±0.5°F (+/-0.3°C)

C. Liquid Differential Pressure Transmitter

Ranges	0-5/30 inches H20 0-25/150 inches H20 0-125/750 inches H20
Output	4 – 20 mA DC
Calibration Adjustments	Zero and span
Accuracy	±-0.2% of span
Linearity	±-0.1% of span
Hysteresis	±-0.05% of span

D. Differential pressure:

1. Unit for fluid flow proof shall be Penn P74.

Range	8 to 70 psi
Differential	3 psi
Maximum differential pressure	200 psi
Maximum pressure	325 psi

2. Unit for airflow shall be Siemens Building Technologies SW141.

Set point ranges:	0.5” WG to 1.0” WG	(124.4 to 248.8 Pa)
	1.0” WG to 12.0” WG	(248.8 to 497.6 Pa)

-continued-

E. Static pressure sensor:

Range	0 to .5” WG (0 to 124.4 Pa)
	0 to 1” WG (0 to 248.8 Pa)
	0 to 2” WG (0 to 497.7 Pa)
	0 to 5” WG (0 to 1.2 kPa
	0 to 10” WG (0 to 2.5 kPa)
Output Signal	4 – 20 mA VDC
Combined static error	0.5% full range
Operating Temperature	-40º to 175º F (-40C to 79.5ºC)

F. Air Pressure Sensor:

Range:	0 to 0.1 in. water (0 to 24.9 Pa)
	0 to 0.25 in. water (0 to 63.2 Pa)
	0 to 0.5 in. water (0 to 124.5 Pa)
	0 to 1.0 in. water (o to 249 Pa)
	0 to 2.0 in water 90 to 498 Pa)
	0 to 5.0 in. water (0 to 1.25 kPa)
	0 to 10.0 in.water (0 to 2.49 kPa)
Output signal	4 to 20 mA
Accuracy	±1.0% of full scale

G. Humidity Sensors:

Range	0 to 100% RH
Sensing Element	Bulk Polymer
Output Signal	4 – 20 mA DC
Accuracy	At 77°F(25ºC) ± 2% RH

H. Insertion Flow Meters (Equal to Onicon Series F-1200)

Sensing Method	Impedance Sensing
Accuracy	± 2% of Actual Reading
Maximum Operating Pressure	400 PSI
Output Signal	4 – 20 mA
Bi-directional where required.	

I. Pressure to Current Transducer

Range	3 to 15 psig (21 to 103 kPa) or
	3 to 30 psig (21 to 207 kPa)
Output signal	4 – 20 mA
Accuracy	± 1% of full scale (± 0.3 psig)

-continued-

J. Control Valves (all control valves shall have electric actuators).

1. Electric Control

Rangeability	40:1
Flow Characteristics	Modified. Equal percentage
Control Action	Normal open or closed as selected
Medium	Steam, water, glycol
Body Type	Screwed ends 2" and smaller, flanged Valves 2½" and larger
Body Material	Bronze
Body Trim	Bronze
Stem	Stainless Steel
Actuator	0-10 VDC, 4-20 MA or 2 position 24 VAC/120VAC

2. All automatic temperature control valves in water lines shall be provided with characterized throttling plugs and shall be sized for minimum 25% of the system pressure drop or 5 psi, whichever is less.

   a) Positive positioning relays shall be provided on pneumatic control when required to provide sufficient power for sequencing.

   b) Two position valves shall be line size.

K. Damper Actuators

1. Electric control shall be Siemens Building Technologies OpenAir™ direct-coupled actuators.

2. Damper actuators shall be Brushless DC Motor Technology with stall protection, bi-directional, fail safe spring return, all metal housing, manual override, independently adjustable dual auxiliary switch.

   a) The actuator assembly shall include the necessary hardware and proper mounting and connection to a standard ½" diameter shaft or damper blade.

3. Actuators shall be designed for mounting directly to the damper shaft without the need for connecting linkages.

4. All actuators having more than 100 lb-in torque output shall have a self-centering damper shaft clamp that guarantees concentric alignment of the actuator's output coupling with the damper shaft. The self-centering clamp shall have a pair of opposed "v" shaped toothed cradles; each having two rows of teeth to maximize holding strength. A single clamping bolt shall simultaneously drive both cradles into contact with the damper shaft.

-continued-

5. All actuators having more than a 100 lb-in torque output shall accept a 1” diameter shaft directly, without the need for auxiliary adapters.

6. All actuators shall be designed and manufactured using ISO9000 registered procedures, and shall be Listed under Standards UL873 and CSA22.2 No. 24-93 l.

2.12 MISCELLANEOUS DEVICES

A. Thermostats

1. Room thermostats shall be of the gradual acting type with adjustable sensitivity.
2. They shall have a bi-metal sensing element capable of responding to a temperature change of one-tenth of one degree. (Provide all thermostats with limit stops to limit adjustments as required.)
3. Thermostats shall be arranged for either horizontal or vertical mounting.
4. In the vertical position thermostat shall fit on a mullion of movable partitions without overlap.
5. Mount the thermostat covers with tamper-proof socket head screws.

B. Current Sensing Relay:

1. Provide solid-state, adjustable, current operated relay. Provide a relay, which changes switch contact state in response to an adjustable set point value of current in the monitored A/C circuit.
2. Adjust the relay switch point so that the relay responds to motor operation under load as an “on” state and so that the relay responds to an unloaded running motor as an “off” state. A motor with a broken belt is considered an unloaded motor.
3. Provide for status device for all fans and pumps.

PART 3 - EXECUTION

3.1 PROJECT MANAGEMENT

Provide a designated project manager who will be responsible for the following:

Construct and maintain project schedule
On-site coordination with all applicable trades, subcontractors, and other integration vendors
Authorized to accept and execute orders or instructions from owner/architect
Attend project meetings as necessary to avoid conflicts and delays
Make necessary field decisions relating to this scope of work
Coordination/Single point of contact

3.2 SEQUENCE OF OPERATION

3.3 START-UP AND COMMISSIONING

A. When installation of the system is complete, calibrate equipment and verify transmission media operation before the system is placed on-line. All testing, calibrating, adjusting and final field tests

-continued-

shall be completed by the manufacturer. Verify that all systems are operable from local controls in the specified failure mode upon panel failure or loss of power.

B. Provide any recommendation for system modification in writing to owner. Do not make any system modification, including operating parameters and control settings, without prior approval of owner.

C. After manufacturer has completed system start-up and commissioning. Joint commissioning of integrated system segments shall be completed.

3.4 ELECTRICAL WIRING AND MATERIALS

A. Install, connect and wire the items included under this Section. This work includes providing required conduit, wire, fittings, and related wiring accessories. All wiring shall be installed in conduit.

B. Provide wiring between thermostats, aquastats and unit heater motors, all control and alarm wiring for all control and alarm devices for all Sections of Specifications.

C. Provide 120 volt, single phase, 60 hertz emergency power to every B.M.S. DDC Controller panel, HVAC/Mechanical Equipment Controller, PC console, power supply, transformer, annunciator, modems, printers and to other devices as required. It is the intent that the entire building management system except terminal equipment shall be operative under emergency power conditions in the building. The power supplies are to be extended in conduit and wire from emergency circuit breakers.

D. Provide status function conduit and wiring for equipment covered under this Section.

E. Provide conduit and wiring between the B.M.S. panels and the temperature, humidity, or pressure sensing elements, including low voltage control wiring in conduit.

F. Provide conduit and control wiring for devices specified in this Section.

G. Provide conduit and signal wiring between motor starters in motor control centers and high and/or low temperature relay contacts and remote relays in B.M.S. panels located in the vicinity of motor control centers.

H. Provide conduit and wiring between the PC workstation, electrical panels, metering instrumentation, indicating devices, miscellaneous alarm points, remotely operated contractors, and B.M.S. panels, as specified.

I. All wiring to be compliant to local building code and the NEC.

J. Provide electrical wall box and conduit sleeve for all wall mounted devices.

-continued-

3.5 PERFORMANCE

A. Unless stated otherwise, control temperatures within plus or minus 2°F humidity within plus or minus 3% of the set point and static pressure within 10% of set point.

3.6 COMMISSIONING, TESTING AND ACCEPTANCE

A. Perform a three-phase commissioning procedure consisting of field I/O calibration and commissioning, system commissioning and integrated system program commissioning. Document all commissioning information on commissioning data sheets, which shall be submitted prior to acceptance testing. Commissioning work, which requires shutdown of system or deviation from normal function, shall be performed when the operation of the system is not required. The commissioning must be coordinated with the owner and construction manager to ensure systems are available when needed. Notify the operating personal in writing of the testing schedule so that authorized personnel from the owner and construction manager are present throughout the commissioning procedure.

1. Prior to system program commissioning, verify that each control panel has been installed. Test, calibrate and bring on line each control sensor and device. Commissioning to include, but not be limited to:

a. Sensor accuracy at 10, 50 and 90% of range.
b. Sensor range.
c. Verify analog limit and binary alarm reporting.
d. Point value reporting.
e. Binary alarm and switch settings.
f. Actuator ranges.
g. Fail safe operation on loss of control signal, electric power, network communications.

B. After control devices have been commissioned (i.e. calibrated, tested and signed off), each BMS program shall be put on line and commissioned. The contractor shall, in the presence of the owner and construction manager, demonstrate each programmed sequence of operation and compare the results in writing. In addition, each control loop shall be tested to verify proper response and stable control, within specified accuracy's. System program test results shall be recorded on commissioning data sheets and submitted for record. Any discrepancies between the specification and the actual performance will be immediately rectified and retested.

C. After all BMS programs have been commissioned, the contractor shall verify the overall system performance as specified. Tests shall include, but not be limited to:

1. Data communication, both normal and failure modes.

2. Fully loaded system response time.

3. Impact of component failures on system performance and system operation.

-continued-

4. Time/Date changes.

5. End of month/ end of year operation.

6. Season changeover.

7. Global application programs and point sharing.

8. System backup and reloading.

9. System status displays.

10. Diagnostic functions.

11. Power failure routines.

12. Battery backup.

13. Smoke Control, stair pressurization, stair, vents, in concert with Fire Alarm System testing.

14. Testing of all electrical and HVAC systems with other division of work.

D. Submit for approval, a detailed acceptance test procedure designed to demonstrate compliance with contractual requirements. This Acceptance test procedure will take place after the commissioning procedure but before final acceptance, to verify that sensors and control devices maintain specified accuracy's and the system performance does not degrade over time.

E. Using the commissioning test data sheets, the contractor shall demonstrate each point. The contractor shall also demonstrate all system functions. The contractor shall demonstrate all points and system functions until all devices and functions meet specification.

F. The contractor shall supply all instruments for testing and turn over same to the owner after acceptance testing.

1. All test instruments shall be submitted for approval.

Test Instrument Accuracy:

Temperature:	.25°F or .5% full scale, whichever is less.
Pressure:	High Pressure (psi): .5 psi or .5% full scale, whichever is less.
	Low Pressure: .5% of full scale (in w.c.)
Humidity:	2% RH
Electrical:	.25% full scale

-continued-

G. After the above tests are complete and the system is demonstrated to be functioning as specified, a thirty-day performance test period shall begin. If the system performs as specified throughout the test period, requiring only routine maintenance, the system shall be accepted. If the system fails during the test, and cannot be fully corrected within eight hours, the owner may request that performance tests be repeated.

Training on System Operation and Control

The DDC system manufacturer or certified representative shall provide a minimum of eight (8) hours of phased training, conducted in two to four hour sessions on the DDC system control and maintenance. The initial system operation training session shall be conducted prior to system commissioning and should be held during the week prior to same. The remaining sessions shall be considered successively advanced classes toward system maintenance and troubleshooting.

-continued-

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: University of Louisiana at Lafayette
Purchasing Office, Martin Hall Room 123
104 University Circle
PO Box 40197
Lafayette, LA 70504
(Owner to provide name and address of owner)

BID FOR: New Iberia Research Center, Building 34, Building Control HVAC System
(Owner to provide name of project and other identifying information)

The undersigned bidder hereby declares and represents that she/he: a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by:
University of Louisiana at Lafayette and dated: April 2010 .
(Owner to provide name of entity preparing bidding documents.)

Bidder must acknowledge all addenda. The Bidder acknowledges receipt of the following ADDENDA: (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging)
_____

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid"* but not alternates) the sum of:

_____Dollars ($_____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1 *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

Add - Additional 12 month Warranty for DDC System. Dollars ($_____)

Alternate No. 2 *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

_____N/A_____Dollars ($_____)

Alternate No. 3 *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

_____N/A_____Dollars ($_____)

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

_____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER**: _____

DATE: _____

***** The **Unit Price Form** shall be used if the contract includes unit prices. Otherwise, it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

****** If someone other than a corporate officer signs for the Bidder/Contractor, a copy of a corporate resolution or other signature authorization shall be required for submission of bid. Failure to include a copy of the appropriate signature authorization, if required, may result in the rejection of the bid unless bidder has complied with La. R.S. 38:2212(A)(1)(c) or RS 38:2212(0).

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA RS 38:2218.A is attached to and made a part of this bid.