SECTION 25 1300

CONTROL AND MONITORING NETWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section describes a complete microprocessor controlled LonMark or BACnet compatible control and monitoring network for the various systems. On the Stanford Controls System Architecture drawing (MC-01), this network is designated as Floor Level Network. This network will connect the following systems:
   1. Air Handlers
   2. Air Terminals
   3. Fan Coil Units
   4. Pumps
   5. Heat Exchangers
   6. Air Conditioners
   7. Heaters

B. The Control and Monitoring Network shall integrate for monitoring to the following systems: (intent is for network communication)
   1. Variable Frequency Drives (hardwired for control)
   2. Lighting (occupancy to be shared)
   3. Fire Alarm (secondary monitoring of HVAC shutdown by fire alarm system.)
   4. Other BAS
   5. Emergency Power (hardwired)

Note: Coordinate all other trades (prior to bid) to insure all aspect of integration are accounted for. Consultant should carefully consider all levels of integration. Edit to actual scope. Basis of Design (BOD) to define project scope. Consultant to consult with Stanford for DDC and Delta V scope reference to 25 0000.

C. Related Sections
   1. 25 0000 Integrated Automation
   2. 25 1219 Integration Protocols
   3. 25 1223 Client-Server Information Database Integration
   4. 25 1400 Local Control Units

1.2 REFERENCES

A. Stanford Network Architecture drawing (MC-01)

B. Refer to 25 0000 Integrated Automation

1.3 DEFINITIONS

A. Refer to 25 0000 Integrated Automation

1.4 SYSTEM DESCRIPTION

A. Provide all network cabling, routers and hubs required to provide a fully functional network.

B. The system shall be modular in nature and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, controllers, and operator interface devices.
C. System architectural design shall minimize dependence upon any single device for alarm reporting and control execution. Each Controller shall operate independently by performing its own specified control, input-output and associated alarms. The failure of any single controller shall not interrupt the execution of control strategies at other operational controllers.

D. Controllers shall be able to access any data from, or send control commands directly to, any other Controller or combination of controllers on the network without dependence upon a central processing device.

1.5 SUBMITTALS

A. Refer to 25 0000 Integrated Automation

B. Submit device schedule. Include:
   1. Device name and physical address
   2. Device location
   3. Connected system
   4. Location served
   5. Make and model number of controller
   6. Alarm parameters
   7. Trending

C. Shop Drawings:
   1. Control drawings
   2. Wiring details
      a. Grounding and shielding requirements.
      b. Termination requirements.
      c. Distance limitations if any.
      d. Power connections
      e. Floorplan of low voltage and communication wiring paths.
   3. Installation details
   4. Bill of materials
   5. Panel layout for major control panels and Architecture for all devices on the FLN
   6. Transformer load calculations

D. All programming shall be submitted to Owner for approval before loading code in any controller

E. Sequence of Operations
   1. Submitted and reviewed separately.

1.6 QUALITY ASSURANCE

A. Refer to 25 0000 Integrated Automation

B. Conformance to loading criteria on network

C. Conform to UL 916.

PART 2 - PRODUCTS

2.1 NETWORK ARCHITECTURE

A. Refer to 25 0000 Integrated Automation

B. Refer to 25 1219 Integration Protocols
C. Provide complete communication architecture for devices as well as other integrated vendor devices.
D. Provide device programming capabilities via tools specified under 25 1516.

2.2 UNMANAGED SWITCHES
A. Molex Brad model number DRL-250P, or approved equal.
B. Switch Functionality – Unmanaged
C. Mounting Style – DIN Rail
D. Temperature Range – (-10 C to +60 C)
E. Protocol – Ethernet (IEEE 802.3)

PART 3 - EXECUTION

3.1 INSTALLATION
A. Provide system to monitor and/or control devices.
B. Connect to 3rd party equipment per network diagram.
C. Provide and coordinate all points for inclusion in database generation per section 25 1223.
D. Each Lon and BACnet segment shall be designed to utilize less than 50% of segment bandwidth. Prior to project acceptance, Owner’s Representative shall utilize a LonScanner or BACnet protocol analyzer to measure all LON and BACnet network segments. Any network segment with an Average Bandwidth Utilization that exceeds 50% in any 15 minute time period shall not be acceptable. At no additional cost to Owner, the Contractor shall reconfigure the network as required to achieve an Average Bandwidth Utilization that is less than 50%.

3.2 NETWORK ARCHITECTURE
A. Coordinate all network communication and low voltage power requirements with appropriate contractor including the installation of cabling, and overall communication system architecture, signal quality, attenuation, power level or special needs of the control system.
B. Building level controls network shall be provided by controls contractor based on approved network drawing submittal. Generate Alarm on loss of communications.

END OF SECTION