PART 1 - GENERAL

1.1 SUMMARY

A. Section includes Network protocols for all control Systems.

B. Related Sections:
   1. 25 12 23 Client-Server Information Database Integration
   2. 25 13 13 Building Level Controller

1.2 REFERENCES

A. ANSI/CEA Standard 709.C LonTalk protocol


1.3 DEFINITIONS

A. Refer to 25 06 11 Integrated Automation Definitions

1.4 SYSTEM DESCRIPTION

A. Refer to Stanford Network Architecture diagrams (MC-01) for additional details.

1.5 QUALITY ASSURANCE

A. Stanford University, LBRE-IT will issue a list of IP addresses for all IP devices.
   1. It is not acceptable for Contractor to use IP addresses not furnished by Owner.

B. Stanford University, LBRE-IT will issue a list of BACnet Device ID’s for all BACnet devices.
   1. It is not acceptable for Contractor to use BACnet Device ID’s not furnished by Owner.

C. BACnet products shall be BTL compliant.

D. Lon products shall be LonMark compliant.

E. Modbus products shall be fully compliant with the Modbus communication protocol developed by Modicon. Any Modbus product that is not fully compliant with the Modbus communication protocol developed by Modicon, may not be acceptable. Contractor shall guarantee that all Modbus products have error-free, bi-directional read and write communication with any device, such as the Campus Emerson Delta V control system, which utilizes the Modbus communication protocol developed by Modicon. Coordinate other system requirements with owner.

Note: Section specific quality requirements should be defined here but not repeated from other sections.

1.6 WARRANTY

A. Include protocol fixes and version upgrades during project.
PART 2 - PRODUCTS

2.1 – Not Used

PART 3 - EXECUTION

3.1 CAMPUS CONTROLS TCP/IP NETWORK COMMUNICATION
A. Campus Controls Network is a VLAN TCP/IP network.
B. Niagarad protocol is permitted on Campus Controls Network.
C. FOX/FOX5 protocols are permitted on Campus Controls Network.
D. HTTP/HTTPS protocols are permitted on Campus Controls Network.
E. BACnet IP protocol is not permitted on Campus Controls Network.
F. Modbus TCP protocol is not permitted on Campus Controls Network.

3.2 BUILDING LEVEL CONTROLS TCP/IP NETWORK COMMUNICATION
A. Building level controls network is a VLAN TCP/IP network.
B. Niagarad protocol is permitted on Building Level Controls Network with no restriction.
C. FOX/FOX5 protocols are permitted on Building Level Controls Network with no restriction.
D. HTTP/HTTPS protocols are permitted on Building Level Controls Network with no restriction.
E. BACnet IP protocol is permitted
F. Modbus TCP protocol is permitted on Building Level Controls Network under limited conditions.

3.3 CONTROL AND MONITORING NETWORK COMMUNICATION
A. BACnet IP protocol is the preferred protocol of the Control and Monitoring Network.
B. LonTalk protocol over LON TP-FT10 network is permitted on the Control and Monitoring Network, under limited conditions, specifically:
   1. Only if necessary to integrate a third party controller that does not have an equivalent controller available from Distech. Equivalency shall be determined by Owner.
   2. And, only if a BACnet IP controller is not available from vendor.
C. BACnet MS/TP protocol is permitted on the Control and Monitoring Network, under limited conditions, specifically:
   1. Only if necessary to integrate a third party controller that does not have an equivalent controller available from Distech. Equivalency shall be determined by Owner.
   2. And, only if a LON controller is not available from vendor.
   3. Only controllers/devices from one single manufacturer are permitted on any MS/TP network. Additional controllers/devices from another manufacturer require a separate MS/TP network.
D. If project requires, Building Level Controllers shall communicate with Delta V Controller via MODBUS RTU.
3.4 Local Controls Units Subnetwork Communication (Local Control Units that are capable of supporting subnetworks)

A. Only non programmable devices are permitted on subnetworks. (VFD’s, meters and so forth) Other controllers are not permitted without approval of Stanford FAC (AHU’s, VAV, FCU and so forth)

B. Bacnet MS/TP is permitted

C. Modbus RTU is permitted

D. M-BUS is permitted

E. LON is not permitted

3.5 System Design

A. The system shall consist of Building System Server, Building Controllers and Local Control Units which includes Primary Equipment Controllers, Secondary Equipment Controllers, etc.

B. The intent of this specification is to provide a distributed and networked open Building Automation System, the capability to integrate BACnet, Lonworks and Modbus into a unified system in order to provide flexibility for expansion, maintenance and service of the system.

C. Systems utilizing gateways will not be considered for this project. A gateway is considered to be a device or controller where the sole function is mapping of data points from one protocol to another.

D. THE BAS shall utilize BACnet/IP for communication between the Building Level Controller(s) and Local Control Units and between different Local Control Units within the building.

END OF SECTION