PART 1 - GENERAL

1.1 COPYRIGHT

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1.2 BMCS DOCUMENTS

A. These specifications for the BMCS include the following Documents:
1. BMCS Bid Forms
2. Instruction to Bidders
3. Division 1 - General conditions and supplemental conditions
4. Section 25 01 00 - BMCS Scope of Work
5. Section 25 05 00 - BMCS General Requirements
6. Section 25 06 00 - BMCS Documentation
7. Section 25 07 00 - BMCS Testing and Inspections
8. Section 25 08 00 - BMCS Commissioning
9. Section 25 11 00 - BMCS Networks and Workstations
10. Section 25 14 00 - BMCS Controllers
11. Section 25 15 00 - BMCS Software
12. Section 25 16 00 - BMCS Software Interfaces
13. Section 25 30 10 - BMCS Field Devices - Electrical
14. Section 25 30 20 - BMCS Field Devices - Air
15. Section 25 30 30 - BMCS Field Devices - Water
16. Section 25 35 19 - BMCS Valves
17. Section 25 35 23 - BMCS Dampers
18. Section 25 80 00 - BMCS Schedules, Diagrams, and Sequences

PART 2 - PRODUCTS

2.1 SCOPE OF WORK

A. Provide a complete BMCS turnkey installation as detailed in this and other sections of these specifications.

B. The BMCS shall comprise the following components:
1. Operator Interface Workstations (OIW).
2. Network Data Servers (NDS).
3. Communication Control Panels (CCP).
4. Distributed Control Panels (DCP).
5. Unitary Controllers (UC).
6. Lighting Control Relay Panels (LCRP).
7. Remote Operator Workstations (ROW).
8. Handheld Devices (HHD).
9. Management level and field level Local Area Networks (LAN).
10. Field instrumentation.
11. Automatic dampers and valves.
12. Actuators for automatic dampers and valves.
13. Software interfaces to controllers provided by others.
14. Operator interface software.
15. All power supplies and conditioners, interlocking and control relays, equipment enclosures, conduit, junction and mounting boxes, cabling, access doors, sleeves, fire stopping and other components, materials and services required for a completed and fully operational turnkey BMCS installation meeting these specifications.

C. Provide the following support for the BMCS facilities:
1. Warranty and service during the warranty period.

2. Submittals, samples and record documentation.
3. Comprehensive commissioning and testing.
4. Training services for the Owner and Operators.
5. Coordination with other site contractors. Provide all necessary system startup assistance and operation of the BMCS to achieve all testing and commissioning requirements for this and other Divisions.
6. Reporting to the Owner, the Architect and Consultant for the coordinated and timely execution of the Work.

D. Furnish terminal unit controllers to the terminal unit manufacturer for factory mounting.

E. Furnish the following devices for installation by Mechanical Subcontractor:
1. Temperature sensing thermowells.
2. Automatic dampers.
3. Inline magnetic flowmeters.
4. Motorized control valves.
5. Water pressuring sensors and switches with isolation valves.
6. Water flow totalizers.
7. Natural gas flow totalizers.

F. Furnish the following devices for installation by Electrical Subcontractor:
1. Lighting control relay panels.

G. 120 VAC power shall be provided by Electrical Subcontractor at locations indicated on the Electrical drawings. Review and verify that these locations are adequate for the proposed BMCS. Extend power from these locations to all devices as necessary.

2.2 BMCS TOPOLOGY

A. The BMCS shall meet the following general criteria:
1. Microprocessor based.
2. Fully networked.
3. Real time.
4. Distributed processing.
5. XML Web based operator interface.

B. The BMCS shall be configured to ensure reliability of systems operation and control of critical functions/systems. In general, all monitoring and control of separate systems shall be achieved via single control panels. Critical inputs of a system shall be wired directly to the controlling panel. Where required, dedicated control panels shall be provided and shall not share any point monitoring or control with other systems.

C. The following describes, in very general terms, a relationship between the various components of the BMCS that would be acceptable. Other BMCS topologies shall be acceptable if they meet the intent and performance requirements defined in these specifications. A possible BMCS architecture is shown in the BMCS Schematic at the end of this section.

D. The OIW shall incorporate, at minimum, Personal Computers (PC) and graphics monitors. The OIW shall reside on the management level Local Area Network (LAN), and shall provide the Operator with a "window" into the BMCS for the accessing of data, the changing of database parameters at the CCP, DCP, and UC and the execution of manually entered commands.

E. The NDS shall provide facilities in addition to those available at the CCP, DCP, and UC for the storage, analysis and retrieval of data and for the storage and down line loading of software to the CCP, DCP and UC. The NDS hardware shall be configured in a primary-backup redundant configuration and shall reside on the management level LAN.

F. The management level LAN shall be a high speed BACnet Ethernet TCP/IP network.

G. The field level LAN shall be BACnet using MS/TP.

H. The CCP shall reside as nodes on the management level LAN (MLAN). CCP shall be fully programmable control panels. CCP shall provide communication coordination with the DCP, interface to the field level LAN (FLAN), and/or shall provide a gateway to third party systems.

I. The DCP shall reside as nodes on the field level LAN. DCP shall be fully programmable control panels. DCP shall provide an interface to the field instrumentation and final control elements.

J. UC shall reside as nodes on the field level LAN. UC shall be fully programmable controllers. Control and monitoring using UC shall be limited to unitary equipment. UC shall provide an interface to the field instrumentation and final control elements for specified items of equipment.

K. The LCRP shall reside as nodes on the management level LAN or field level LAN.

L. The ROW shall provide the Operator with an interface to the BMCS at each CCP, DCP and UC location. The ROW shall also provide the Operator with remote access direct to the BMCS via the internet. The ROW shall be a portable PC. The ROW shall also enable the Operator to access each CCP, DCP, and UC throughout the BMCS.

M. The Hand Held Devices (HHD) shall enable the Operator to access data, change database parameters and execute manually entered commands. The HHD shall also provide the Operator with wireless access direct to the BMCS. The HHD shall be a tablet style device.

2.3 BMCS ALTERNATES

A. Alternate BMCS-1: Maintenance services during the Warranty Period, refer to the BMCS General Requirements section of these specifications.

B. Alternate BMCS-2: Extended Warranty and Maintenance, refer to BMCS the General Requirements section of these specifications.

C. Alternate BMCS-3A: Provide a software and hardwired interfaces to monitor and control points the Carrier chillers as listed in the BMCS Software Interfaces section and the BMCS Field Termination Schedule section of these specifications in association with the associated Mechanical Alternates M-1 and M-4.

D. Alternate BMCS-3B: Provide a software and hardwired interfaces to monitor and control points the Trane chillers as listed in the BMCS Software Interfaces section and BMCS Field Termination Schedule section of these specifications in association with the associated Mechanical Alternates M-2 and M-5.

E. Alternate BMCS-3C: Provide a software and hardwired interfaces to monitor and control points the York chillers as listed in the BMCS Software Interfaces section and BMCS Field Termination Schedule section of these specifications in association with the associated Mechanical Alternates M-3 and M-6.

F. Alternate BMCS-4A: Provide a software and hardwired interfaces to monitor and control points the Carrier chillers as listed in the BMCS Software Interfaces section and the BMCS Field Termination Schedule section of these specifications in association with the associated Mechanical Alternates M-1A and M-4A.

G. Alternate BMCS-4B: Provide a software and hardwired interfaces to monitor and control points the Trane chillers as listed in the BMCS Software Interfaces section and BMCS Field Termination Schedule section of these specifications in association with the associated Mechanical Alternates M-2A and M-5A.

H. Alternate BMCS-4C: Provide a software and hardwired interfaces to monitor and control points the York chillers as listed in the BMCS Software Interfaces section and BMCS Field Termination Schedule section of these specifications in association with the associated Mechanical Alternates M-3A and M-6A.

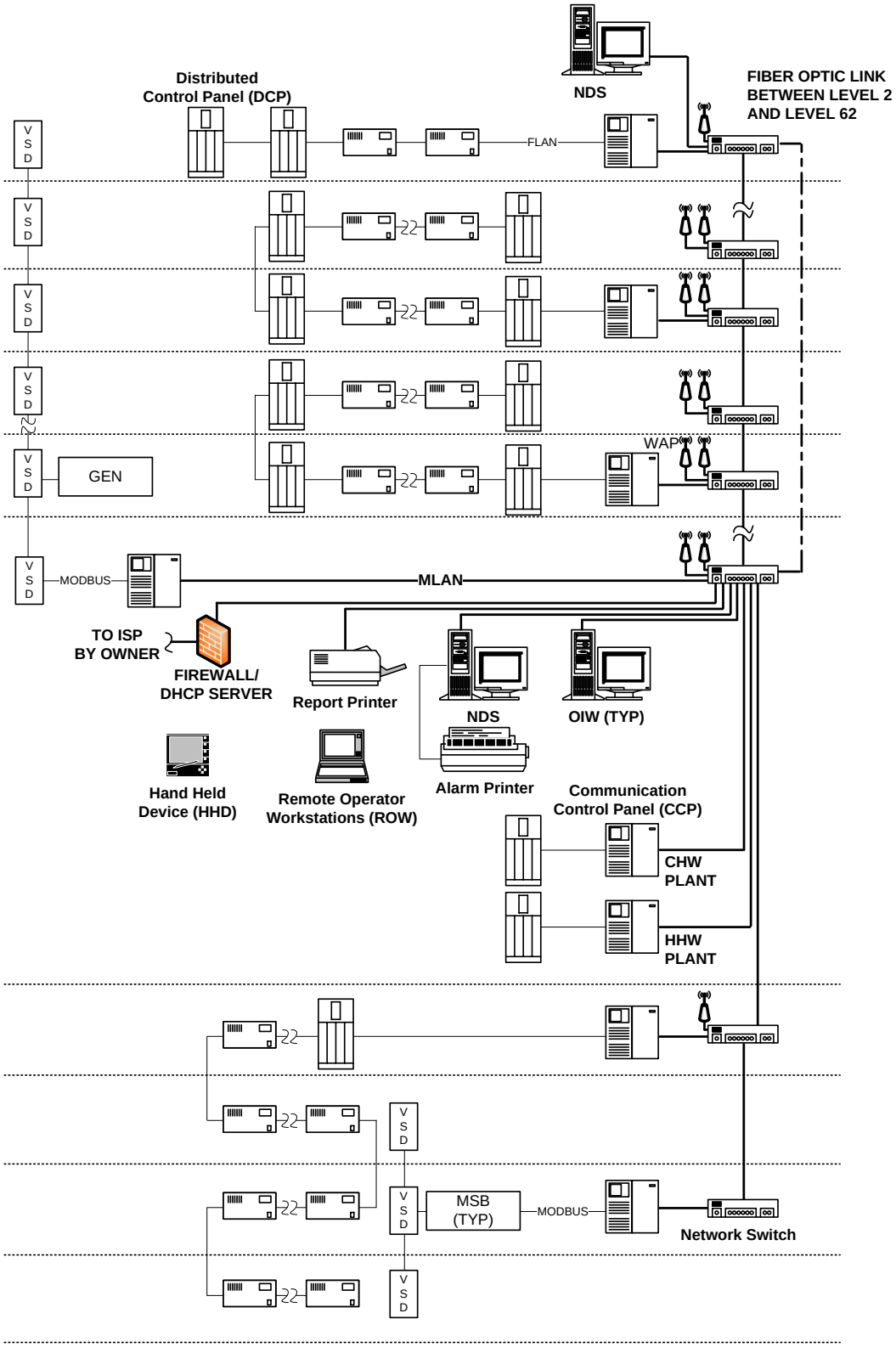
I. Alternate BMCS-5: Provide floor-by-floor alternate price for control of fan powered terminal units included in tenant level HVAC finish of levels 3, 4, and 5 in association with Mechanical Alternate M-16.

J. Alternate BMCS-6: Provide alternate price to overhead air distribution for Level 61 as identified in association with the associated Mechanical Alternates M-17.

2.4 BMCS UNIT PRICES

A. Changes to the Contract Price will be considered only for Owner required Contract changes. Such changes to the Contract Price will be authorized only by written change order. Unit prices shall remain in effect throughout the duration of the Contract.

B. Submit unit prices as detailed in the bid forms.



BMCS ARCHITECTURE SCHEMATIC