

SECTION 23 08 00

CONTRACTOR-PROVIDED COMMISSIONING OF HVAC SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The requirements of this Section apply to all sections of Division 23.
- B. This project will have selected building systems commissioned. The complete list of equipment and systems to be commissioned are specified in Section 01 9101 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS. The commissioning process, which the Contractor is responsible to execute, is defined in Section 01 9101 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS. The Contractor's Commissioning Agent (CxA) shall manage the commissioning process.
- C. Commissioning of a system or systems specified for this project is part of the construction process. Documentation and testing of these systems, as well as training of the VA's Operation and Maintenance personnel, is required in cooperation with the VA and the Contractor's Commissioning Agent.

1.2 RELATED WORK

- A. Section 01 00 00 GENERAL REQUIREMENTS.
- B. Section 01 91 01 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS.
- C. Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

1.3 SUMMARY

- A. This Section includes requirements for commissioning the HVAC systems, subsystems and equipment. This Section supplements the general requirements specified in Section 01 91 01 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS.
- B. The commissioning activities have been developed to support the VA requirements to meet guidelines for Federal Leadership in Environmental, Energy, and Economic Performance.
- C. Refer to Section 01 91 01 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS for more specifics regarding processes and procedures as well as roles and responsibilities for all Commissioning Team members.

1.4 DEFINITIONS

- A. Refer to Section 01 91 01 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS for definitions.

1.5 COMMISSIONED SYSTEMS

- A. Commissioning of a system or systems specified in this Division is part of the construction process. Documentation and testing of these systems, as well as training of the VA's Operation and Maintenance personnel, is required in cooperation with the VA and the Contractor's Commissioning Agent.
- B. The following HVAC systems (Division 23) will be commissioned:
- a. Trending of Existing Air Handling Systems (AHU-30, AHU-31, and New and Existing Exhaust Systems serving the 3rd floor of the Acres Building: Fans, motors, Variable Speed Drives, air flows, temperature sensors, safeties such as fire alarm, smoke detectors or freezestats and damper end switches, controls).
 - b. Heating Hot Water Systems (New reheat water pumps and motors, controls, Variable Speed Drives, pipe differential pressure sensors).
 - c. New and Existing Exhaust Fans serving the 3rd floor (Fans, motors, Variable Speed Drives, duct static pressure sensors, controls and safeties).
 - d. Direct Digital Control System (BACnet or similar Local Area Network (LAN), Operator Work Station hardware and software, building controller hardware and software, terminal unit controller hardware and software, all sequences of operation, system accuracy and response time). Complete verification that dynamic readings of temperature, pressure, air flow, and water flow displayed on the existing Honeywell primary display and the Alerton front-end Secondary Display System (ECC) match the actual field readings at each device.
 - e. New Exhaust Heat Recovery Systems extracting and rejecting heat to the general exhaust systems serving floors 3, 4 and 5 of the Acre

Building in order to precondition the outdoor air ventilation for central air handling units AHU-30 and AHU-31. Include verification that dynamic readings of temperatures, differential pressure, and air flows are accurately displayed on the existing Honeywell Front-end System as well as the Alerton Front-end Display.

- e. Laboratory Exhaust Systems (Fume hoods, Biosafety Cabinets, hood alarms, pressure controls, snorkels, system alarms, fans, motors, and Variable Speed Drives).
- f. Laboratory Ventilation Systems (Supply air terminal units and controls, pressure controls, offset flow tracking systems and alarms, fans, motors, and Variable Speed Drives).
- g. Wireless temperature monitors mounted in the walk-in coolers on the 3rd, 4th and 5th floors of Acre Building. Demonstrate "Checkpoint" software for display of temperature readings and historical graphs.
- h. Test and Balance:
 - a. Preconstruction air flows and pressure readings in ducts and systems listed under Section 23 0593.
 - b. Post-Construction air flows and pressure readings in ducts and systems listed under Section 23 0593.
 - c. Review of new duct connections at inlets to air valves, fume hoods and Bio-safety Cabinets.
 - d. Coordinate work of Test & Balance Subcontractor (Section 23 05 93) with DDC Controls Vendor (Section 23 09 23) for air flow at all terminal boxes, exhaust valves, air handling units, and exhaust fans as well as water flow at all heating and cooling coils and heat exchangers.
- i. Room Pressurization Controls for Animal Procedure and Tissue Culture Rooms (Pressure sensors, terminal units/air valves, controllers and alarms).
- j. Offset Flow-Tracking Equipment for Laboratories (Flow sensors, terminal units/air valves, controls and alarms).

- k. Fire alarm interlocks with air handling systems AHU-30 & AHU-31 and control of combination fire/smoke dampers from their duct-mounted smoke detectors.
- l. HVAC Water Treatment Systems (Closed circuit systems - including shot feeders and final water analysis - including water analysis, flushing system, and introduction of corrosion inhibitors).
- m. From Division 21, Fire Protection System (Fire pump, jockey pump, fire pump automatic transfer switch/controller, Wet-pipe fire suppression, Dry-pipe fire suppression, Pre-action fire suppression, dry system air compressors and motors, and clean agent fire suppression).
- n. From Division 22, the new steam-fired Domestic Water Heaters, DW discharge temperature sensors, Domestic Water Booster Pumps, 6th floor domestic water pressure, New Fire Pump Status and standpipe pressure at highest point in the Acres Building.

1.6 SUBMITTALS

- A. The commissioning process requires review of selected Submittals. The Contractor's Commissioning Agent shall provide a list of submittals that will be reviewed by the Contractor's Commissioning Agent. This list will be reviewed and approved by the VA prior to forwarding to the Contractor. Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, and SAMPLES for further details.
- B. The commissioning process requires Submittal review simultaneously with engineering review. Specific submittal requirements related to the commissioning process are specified in Section 01 91 01 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PRE-FUNCTIONAL CHECKLISTS

- A. The Contractor shall complete Pre-Functional Checklists to verify systems, subsystems, and equipment installation is complete and systems are ready for Systems Functional Performance Testing. The Contractor's

Commissioning Agent shall prepare Pre-Functional Checklists to be used to document equipment installation. The Contractor shall complete the checklists. Completed checklists shall be submitted to the VA and to the Contractor's Commissioning Agent for review. The Contractor's Commissioning Agent may spot check a sample of completed checklists. If the Contractor's Commissioning Agent determines that the information provided on the checklist is not accurate, the Contractor's Commissioning Agent shall return the marked-up checklist to the Contractor for correction and resubmission. If the Contractor's Commissioning Agent determines that a significant number of completed checklists for similar equipment are not accurate, the Contractor's Commissioning Agent shall select a broader sample of checklists for review. If the Contractor's Commissioning Agent determines that a significant number of the broader sample of checklists is also inaccurate, all the checklists for the type of equipment will be returned to the Contractor for correction and resubmission. Refer to SECTION 01 91 01 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS for submittal requirements for Pre-Functional Checklists, Equipment Startup Reports, and other commissioning documents.

3.2 CONTRACTORS TESTS

- A. Contractor tests as required by other sections of Division 23 shall be scheduled and documented in accordance with Section 01 00 00 GENERAL REQUIREMENTS. The Contractor's Commissioning Agent shall witness selected Contractor tests. Contractor tests shall be completed prior to scheduling Systems Functional Performance Testing.

3.3 SYSTEMS FUNCTIONAL PERFORMANCE TESTING:

- A. The Commissioning Process includes Systems Functional Performance Testing that is intended to test systems functional performance under steady state conditions, to test system reaction to changes in operating conditions, and system performance under emergency conditions. The Contractor's Commissioning Agent shall prepare detailed Systems Functional Performance Test procedures for review and approval by the

Resident Engineer. The Contractor shall review and comment on the tests prior to approval. The Contractor shall provide the required labor, materials, and test equipment identified in the test procedure to perform the tests. The Contractor's Commissioning Agent shall witness and document the testing. The Contractor shall sign the test reports to verify tests were performed. See Section 01 91 01 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS, for additional details.

3.4 TRAINING OF VA PERSONNEL

- A. Training of the VA's operation and maintenance personnel is required in cooperation with the Resident Engineer and Contractor's Commissioning Agent. Provide competent, factory authorized personnel to provide instruction to operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems. The instruction shall be scheduled in coordination with the Resident Engineer after submission and approval of formal training plans. Refer to Section 01 91 01 CONTRACTOR-PROVIDED COMMISSIONING REQUIREMENTS and Division 23 Sections for additional Contractor training requirements.

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