

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 General requirements for Commissioning of Integrated Automation equipment and systems.

.2 Related Sections:

- .1 Section 01 35 20 LEED Sustainable Requirements
- .2 Section 01 74 19 Waste Management and Disposal
- .3 Section 01 91 13 General Commissioning Requirements
- .4 Section 22 08 00 Commissioning of Plumbing
- .5 Section 23 08 00 Commissioning of HVAC
- .6 Section 26 08 00 Commissioning of Electrical Systems

.3 Acronyms:

- .1 Cx - Commissioning.
- .2 CxA - Commissioning Agent

1.2 INTENT

.1 Provide commissioning of integrated automation equipment and systems in accordance with this, Section 01 91 13 General Commissioning Requirements and related sections.

.2 All items noted in this document are the responsibility of the contractor supplying and installing the equipment, unless noted otherwise.

1.3 MANUFACTURER'S SERVICE ON SITE

.1 Arrange and pay for qualified Manufacturer's representatives to supervise starting and testing of following equipment and systems:

.1 Controls Components

.2 Use manufacturers factory trained personnel where required to maintain manufacturer's warranty.

.3 Maintain documentation of all equipment start-up and commissioning and provide to Commissioning Agent.

Part 2 Products

- 2.1 Not Used

Part 3 Execution

3.1 GENERAL

- .1 Commission all equipment and systems installed as part of this contract. Typical required information or actions are listed below for each equipment or system.
- .2 Provide check sheets for equipment not listed in this section.
- .3 Document the commissioning process by completing the System (functional) Tests and Integrated System Tests.

3.2 INTEGRATED CONTROL SYSTEMS

- .1 Check that installation is in accordance with drawings, specifications and Manufacturer's recommendations.
- .2 Commissioning must be completed by qualified technical staff that have the capability to deliver a fully commissioned system in a timely manner as further described in this section.
 - .1 Submit control calibration check sheets prior to system acceptance. Check sheets to include unit identification, controller/transmitter tag numbers, device controlled, controller PID settings, interlock devices and wire tag numbers.
 - .2 Provide system control sequences and points list, along with controls drawings.
 - .3 Set damper linkages, static pressure/volume controls as required by the balancing trade.
 - .4 Adjust and calibrate all input/output devices prior to system acceptance. Include settings on As-Built control drawings.
 - .5 Test the operation of all monitored and controlled points as well as the operation and capabilities of all sequences, reports, specialized control programs and algorithms, diagnostics and all other software.
 - .6 Graphic displays must be installed and fully operational prior to the start of commissioning. Submit printout of graphics for approval as outlined in Specifications.
 - .7 Each control loop measured variable and calculated setpoint must be placed on a continuous trend. Submit trend report printouts for approval.
 - .8 Load/save of database must be demonstrated.
 - .9 All features of the system must have been demonstrated.
 - .10 All alarms shall be operational.
 - .11 Acceptance testing shall not start until the Contractor has demonstrated that the system has been fully commissioned.
- .3 In addition to general start-up and commissioning requirements, the Contractor shall provide on-site manpower for installation testing, systems/functional testing, and integrated systems testing with the Contract Administrator and CxA:

- .1 Provide verification of the graphical operator interface in accordance with Specifications.
- .2 Provide verification of the sequences of operation, custom programming and loop tuning of systems.
- .3 Provide a final operational acceptance test of 7 consecutive days. This test shall be conducted on the complete and total installed and operational control system in order to demonstrate that it is functioning properly in accordance with the specifications. In addition, a second 7-day test will be required as part of seasonal testing.

In addition to the 7-day test, the following shall be demonstrated:

- .1 Fire alarm simulation.
 - .2 Power failure simulation and recovery.
 - .3 Hardware and software limits.
 - .4 Remote system access (if specified).
 - .5 Spot checks of end-to-end integrity will be carried out.
 - .6 System communication and graphic update speeds.
- .4 Complete alarm log shall be maintained for the duration of the 7-day test. The log will be submitted at the end of the test.
 - .5 The printer (if used for alarms) shall be left on for the complete 7-day test. Printouts are to be submitted for review at the end of the test.
 - .6 Results of all tests shall be documented and submitted to the CxA for review.
 - .7 Prior to acceptance of the Work, submit the hard copy and two backup copies of the entire database and operating system software.
 - .8 During the test, in the event of equipment failure of any of the hardware components, software applications or routines, the test will recommence and run until 7 failure-free test days have occurred.

3.3 MECHANICAL EQUIPMENT AND SYSTEMS DEMONSTRATION AND INSTRUCTION

- .1 Provide demonstrations and instruction in accordance with Section 01 91 13 General Commissioning Requirements.

END OF SECTION