

FACILITIES BUILDING STANDARDS

Section 25 0000 Integrated Automation

Revised date: 09/18/18

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the general requirements for the Integrated Automation systems.
- B. Related Sections:
 - 1. All sections within Division 25.
 - 2. 019113 Commissioning
- C. Where architectural features govern location of work, refer to architectural drawings and coordinate with other trades.
- D. Provide products, software, graphics, etc. consistent with existing systems.

1.2 REFERENCES

- A. This section includes any rules and regulations of Federal, State, local authorities, and utility companies in force at the time of execution of contract.
- B. Agencies or publications referenced herein refer to the following:
 - 1. ADA Americans with Disabilities Act
 - 2. ANSI American National Standards Institute
 - 3. ASHRAE American Society for Heating, Refrigeration, Air-Conditioning Engineers
 - 4. ASTM American Society for Testing and Materials
 - 5. BICSI Building Industry Consulting Services International
 - 6. EIA Electronic Industries Association
 - 7. FCC Federal Communications Commission
 - 8. ICEA Insulated Cable Engineers Association
 - 9. IEEE Institute of Electrical & Electronics Engineers
 - 10. ISO International Organization for Standards
 - 11. NEC National Electrical Code (2002)
 - 12. NECA National Electrical Contractors Association
 - 13. NEMA National Electrical Manufacturers Association
 - 14. NETA National Electrical Testing Association
 - 15. NIST National Institute of Standards & Technology
 - 16. OSHA Occupational Safety and Health Administration
 - 17. TIA Telecommunications Industries Association
 - 18. UL Underwriters Laboratories, Inc.

1.3 DEFINITIONS

- A. AHU Air Handling Unit
- B. ATC Automatic Temperature Control
- C. ATU Air Terminal Unit
- D. AWG American Wire Gauge (standard wire size measurement)
- E. BAS Building Automation System
- F. Device Intelligent controller or other automated monitoring piece of equipment
- G. CD Compact Disc used for data storage
- H. Commissioning Process to ensure installation and functionality is per design
- I. Enterprise Top level of integrated systems for overall logistical monitoring and business planning
- J. EBMS Enterprise Building Management System
- K. FCU Fan Coil Unit
- L. IBS Integrated Building Systems
- M. I/O Hardware inputs and outputs
- N. Instrument Device used to sense inputs or control outputs or both
- O. Integration Connection of disparate systems to a common platform using communication protocols.
- P. IP Address Internet Protocol node address
- Q. IT Information Technologies
- R. Object Hardware or Software component such as a device or point.
- S. Point Single hardware input/output or software data objects such as setpoints and attributes.
- T. Pointlist List of inputs, outputs and parameters for specific systems
- U. RFI Request for Interpretation
- V. Stand-Alone The ability to function upon loss of communication.

1.4 SYSTEM DESCRIPTION

- A. System will be an extension of existing Johnson Controls Inc. (JCI) Building Automation System.
- B. Integrate system with existing Enterprise Building Automation System (EBMS).

C. Request IP addresses and other IT requirements from Owner to accommodate project schedule.

1.5 SUBMITTALS

- A. Submit complete schedule/outline of all submittals prior to submittal submission. Include:
1. Specification Compliance
 - a. Provide a paragraph-by-paragraph specification compliance report.
 - b. Indicate compliance for each numbered paragraph.
 - c. The following format shall be used in completing the compliance report:
 - 1) Comply—without exception.
 - 2) Qualify—meet the functional intent. For each paragraph, the contractor shall identify all differences in specific functions stated in the given paragraph and provide a description of what is excluded or how the qualifying system will meet the function specified.
 - 3) Does not comply—cannot meet specified function.
 2. Products:
 - a. All required components and accessories.
 - b. Identify actual product model number used for each control drawing.
 - c. Identify any proposed modifications to system design. (Specifications or Drawings)
 - d. Organize product data based on specification Section, Part, and Article.
 3. Record Documents:
 - a. Include field condition updates.
 - b. Document material, make and model numbers where appropriate. c. Update details, schedules, risers, etc.
 - d. I/O point as-builts.
 - e. Sequence details, modifications, or updates.
 - f. Control loops including final set-points and parameters.
 - g. Mark and detail on coordination drawings, exact locations of equipment installed.
 - h. Panel details for each unique panel.
 4. Operation Manuals
 - a. Network architecture and communications concepts/diagrams.
 - b. CD of any configuration tools used in project.
 - c. Calibration and/or verification sheets.

1.6 QUALITY ASSURANCE

- A. Provide material with UL label or be UL listed, unless UL label or listing is not available for that type of material.
- B. All systems, equipment, components, accessories, and installation hardware must be new, free from defects, and currently in production.
- C. Provide the same manufacturer components of a given type product throughout project.

- D. Support future compatibility for no less than 7 years with the ability to upgrade existing field panels and extend new field panels on an installed network.
- E. Digital equipment furnished under this contract shall have been tested and made to comply with limits of Class A computing device pursuant to Subpart J of Part 15 of FCC Rules.
- F. Maintain NEC workspace clearances.
 - 1. Install and operationally check systems utilizing factory-trained competent technicians skilled in the setting and adjustment of equipment used in this project.
- G. Test, adjust, and calibrate all end instruments.
- H. Request for Interpretation (RFI) shall include:
 - 1. Include Referenced drawing and/or Specification Section number.
 - 2. Single request per RFI
 - 3. Single proposed solution per RFI
 - 4. Attached sketch of solution (if applicable)
 - 5. Attached specification verbiage (if applicable)
 - 6. Incomplete RFI's will be returned without response.
- I. Install devices in appropriate enclosure and in an accessible location.
- J. Install systems and devices in a neat, workmanlike manner and in accordance with manufacturer's recommendations.
- K. Continually monitor the field installation for code compliance and quality workmanship.
- L. Remove and re-install any systems or devices where installation is deemed of poor quality by Owner or Engineer.
- M. Provide software and firmware updates prior to and within 2 months of substantial completion.
- N. Comply with all health and safety regulations.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products according to manufacturer's recommendations.
- B. Store products in original manufacturers packaging.
- C. Do not store products more than 3 months prior to schedule installation.
- D. Coordinate deliveries of material with construction schedule and appropriate trades.

1.8 SCHEDULING

- A. Included in this project are connections to equipment provided by others. Coordinate deliveries, final locations, factory mounting, and various connections required.
- B. Coordinate activities with contract project schedule.
 - 1. Ensure integration activities are incorporated into project schedule.

- 2. Communicate requirements to prevent potential damage from paint, dust, water, weather, etc. Monitor and take measure to assure protection for all equipment.
- C. Coordinate all IT requirements with owner and contract project schedule.
- D. Provide services incidental to proper performance.

1.10 SYSTEM STARTUP

- A. Start equipment according to manufactures recommendation.
- B. Document system start up time and date.
- C. Document person(s) performing startup.
- D. Provide vendor specific start up documentation.

PART 2 - PRODUCTS

2.1 NOT USED.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to start of any work, check, verify, and coordinate work with drawings and specifications prepared for other trades. Include modifications, relocations, or adjustments necessary to complete work or to avoid interference with other trades.
- B. Promptly request clarification and instruction or report any conflicts, inadequate conditions or missing information in the Project Documents. Report unacceptable conditions immediately.
- C. Inspect site to verify that equipment can be installed as shown.
- D. Examine drawings and specifications for work of others.
- E. Perform necessary changes in specified work caused by failure or neglect to report discrepancies.

3.2 INSTALLATION

- A. Install equipment, piping, and wiring or raceway horizontally, vertically, and parallel to walls wherever possible.
- B. Provide sufficient slack, flexible connections and isolation to allow for equipment vibration.
- C. Verify elevations and measurements prior to installation of materials.
- D. Beginning installation means contractor accepts existing conditions.
- E. Conceal wiring in conduit in mechanical spaces, above hard ceilings, and other spaces where exposed wiring could be damaged.

- F. Provide temporary service, routing of service, or other temporary requirements to minimize downtime of service.
- G. Equipment and wiring shall be selected and installed for conditions in which it will be required to perform. (i.e., general purpose, weatherproof, rain-tight, explosion proof, dust tight, or any other special type as required.)
- H. Arrange for necessary openings in building to allow for admittance of all apparatus.
- I. Install equipment with ample space allowed for removal, repair or changes to equipment. Provide ready accessibility to equipment and wiring without moving other equipment, which is to be installed or which is already in place.
- J. Coordinate all systems in order to minimize access door requirements.
- K. Coordinate final locations, sizes and rough-in dimensions for access doors.
- L. Verify door swings for proper clearance before installing.
- M. Perform of the work in a safe and competent manner and use of industry accepted installation procedures required for the work.
- N. All temperature monitoring shall be through structured cable unless the building system does not support the use of structured cabling.

3.3 FIELD QUALITY CONTROL

- A. Testing:
 - 1. Conduct a complete performance test for all systems to assure compliance with the contract documents.
 - a. Any components on systems found defective or not performing satisfactorily shall be readjusted and retested after necessary corrective measures are performed.
 - b. Corrective measures may include modification or addition of equipment and devices, control strategies and/or software program.
 - 2. When testing is to be witnessed by Engineer or Inspector, Schedule Engineer at least 10 days prior to testing date.
- B. Repair, reprogram or replace any equipment or work that fails test.

3.4 CLEANING

- A. Upon completion of each phase, system, panel, etc, clean all system panels, enclosures and field device enclosures.
- B. Clean debris from equipment, control panels, security panels, and fire panel enclosures, junction boxes and pull boxes and arrange wire neatly with surplus length cut off prior to installation of covers.
- C. Thoroughly clean equipment of stains, paint spots, dirt and dust. Remove temporary labels not used for instruction or operation.

3.5 DEMONSTATION

- A. Demonstrate operation of systems with Owner or Engineer.

3.6 PROTECTION

- A. Protect installation against and be liable for damage to work and to material caused by Contractor's work or employees.
- B. Maintain protection for work and equipment until inspected, tested, and accepted.
- C. Protect material not immediately installed.
- D. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of foreign objects.
- E. Material sensitive to temperature, dust, humidity, or other elements and found unprotected shall be replaced.
- F. Material with showing signs of exposure shall be replaced.

END OF SECTION