

Part 1 General**1.1 REFERENCE STANDARDS**

- .1 American National Standards Institute (ANSI)/The Instrumentation, Systems and Automation Society (ISA).
 - .1 ANSI/ISA 5.5-latest revision, Graphic Symbols for Process Displays.
- .2 American National Standards Institute (ANSI)/ Institute of Electrical and Electronics Engineers (IEEE).
 - .1 ANSI/IEEE 260.1-latest revision, American National Standard Letter Symbols Units of Measurement (SI Units, Customary Inch-Pound Units, and Certain Other Units).
- .3 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).
 - .1 ASHRAE STD 135-latest revision, BACNET - Data Communication Protocol for Building Automation and Control Network.
- .4 CSA Group (CSA).
 - .1 CAN/CSA-Z234.1-89(R1995), Canadian Metric Practice Guide.
- .5 Consumer Electronics Association (CEA).
 - .1 CEA-709.1-B-2002, Control Network Protocol Specification.
- .6 Department of Justice Canada (Jus).
 - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
 - .2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .7 Electrical and Electronic Manufacturers Association (EEMAC).
 - .1 EEMAC 2Y-1-1958, Light Grey Colour for Indoor Switch Gear.
- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Safety Data Sheets (SDS).
- .9 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.2 ABBREVIATIONS AND ACRONYMS

- .1 Acronyms used in EMCS:
 - .1 AEL - Average Effectiveness Level
 - .2 AI - Analog Input
 - .3 AIT - Agreement on International Trade
 - .4 AO - Analog Output
 - .5 BACnet - Building Automation and Control Network.
 - .6 BC(s) - Building Controller(s).

- .7 BECC - Building Environmental Control Centre.
- .8 CAD - Computer Aided Design.
- .9 CDL - Control Description Logic.
- .10 CDS - Control Design Schematic.
- .11 COSV - Change of State or Value.
- .12 CPU - Central Processing Unit.
- .13 DI - Digital Input.
- .14 DO - Digital Output.
- .15 DP - Differential Pressure.
- .16 ECU - Equipment Control Unit.
- .17 EMCS - Energy Monitoring and Control System.
- .18 HVAC - Heating, Ventilation, Air Conditioning.
- .19 IDE - Interface Device Equipment.
- .20 I/O - Input/Output.
- .21 ISA - Industry Standard Architecture.
- .22 LAN - Local Area Network.
- .23 LCU - Local Control Unit.
- .24 MCU - Master Control Unit.
- .25 NAFTA - North American Free Trade Agreement.
- .26 NC - Normally Closed.
- .27 NO - Normally Open.
- .28 OS - Operating System.
- .29 O&M - Operation and Maintenance.
- .30 OWS - Operator Work Station.
- .31 PC - Personal Computer.
- .32 PCI - Peripheral Control Interface.
- .33 PCMCIA - Personal Computer Micro-Card Interface Adapter.
- .34 PID - Proportional, Integral and Derivative.
- .35 RAM - Random Access Memory.
- .36 SP - Static Pressure.
- .37 ROM - Read Only Memory.
- .38 TCU - Terminal Control Unit.
- .39 USB - Universal Serial Bus.
- .40 UPS - Uninterruptible Power Supply.
- .41 VAV - Variable Air Volume.

1.3 DEFINITIONS

- .1 Point: may be logical or physical.

- .1 Logical points: values calculated by system such as setpoints, totals, counts, derived corrections and may include, but not limited to result of and statements in CDL's.
- .2 Physical points: inputs or outputs which have hardware wired to controllers which are measuring physical properties, or providing status conditions of contacts or relays which provide interaction with related equipment (stop, start) and valve or damper actuators.
- .2 Point Name: composed of two parts, point identifier and point expansion.
 - .1 Point identifier: comprised of three descriptors, "area" descriptor, "system" descriptor and "point" descriptor, for which database to provide 25 character field for each point identifier. "System" is system that point is located on.
 - .1 Area descriptor: building or part of building where point is located.
 - .2 System descriptor: system that point is located on.
 - .3 Point descriptor: physical or logical point description. For point identifier "area", "system" and "point" will be shortforms or acronyms. Database must provide 25character field for each point identifier.
 - .2 Point expansion: comprised of three fields, one for each descriptor. Expanded form of shortform or acronym used in "area", "system" and "point" descriptors is placed into appropriate point expansion field. Database must provide 32 character field for each point expansion.
 - .3 Bilingual systems to include additional point identifier expansion fields of equal capacity for each point name for second language.
 - .1 System to support use of numbers and readable characters including blanks, periods or underscores to enhance user readability for each of the above strings.
- .3 Point Object Type: points fall into following object types:
 - .1 AI (analog input).
 - .2 AO (analog output).
 - .3 DI (digital input).
 - .4 DO (digital output).
 - .5 Pulse inputs.
- .4 Symbols and engineering unit abbreviations utilized in displays: to ANSI/ISA S5.5.
 - .1 Printouts: to ANSI/IEEE 260.1.
 - .2 Refer also to Section 25 05 54 - EMCS: Identification.

1.4 SYSTEM DESCRIPTION

- .1 Refer to section 23 53 16 and M900 for system architecture.
- .2 Retain the services of Honeywell or its authorized representative to complete the work of all building automation system sections.

- .3 The existing EMCS controls contractor “Honeywell” to connect digital PID controller to Building Automation System. The EMCS controls contractor shall connect the existing boiler control panel to deaerator PID controller to set up boiler feed pump interlocks. The EMCS control contractor shall perform the installation, testing, commissioning, connection to the existing building automation system and update the graphics.
- .4 Work covered by sections referred to above consists of fully operational EMCS, including, but not limited to, following:
 - .1 Data communications equipment necessary to effect EMCS data transmission system.
 - .2 Software/Hardware complete with full documentation.
 - .3 Complete operating and maintenance manuals.
 - .4 Training of personnel.
 - .5 Acceptance tests, technical support during commissioning, full documentation.
 - .6 Wiring interface co-ordination of equipment supplied by others.
 - .7 Miscellaneous work as specified in these sections and as indicated.
- .5 Design Requirements:
 - .1 Design and provide conduit and wiring linking elements of system.
 - .2 Supply sufficient programmable controllers of types to meet project requirements. Quantity and points contents as reviewed by Departmental Representative prior to installation.
 - .3 Metric references: in accordance with CAN/CSA Z234.1.
- .6 Language Operating Requirements:
 - .1 Provide English or French operator selectable access codes.
 - .2 Use non-linguistic symbols for displays on graphic terminals wherever possible. Other information to be in English and French.
 - .3 Operating system executive: provide primary hardware-to-software interface specified as part of hardware purchase with associated documentation to be in English and French.
 - .4 System manager software: include in English and French system definition point database, additions, deletions or modifications, control loop statements, use of high level programming languages, report generator utility and other OS utilities used for maintaining optimal operating efficiency.
 - .5 Include, in English and French:
 - .1 Input and output commands and messages from operator-initiated functions and field related changes and alarms as defined in CDL's or assigned limits (i.e. commands relating to day-to-day operating functions and not related to system modifications, additions, or logic re-definitions).
 - .2 Graphic "display" functions, point commands to turn systems on or off, manually override automatic control of specified hardware points. To be in French and English at specified OWS and to be able to operate one terminal in English and second in French. Point name expansions in both languages.

- .3 Reporting function such as trend log, trend graphics, alarm report logs, energy report logs, maintenance generated logs.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures and 25 05 02 - EMCS: Shop Drawings, Product Data and Review Process.
- .2 Submit for review:
 - .1 Equipment list and systems manufacturers within 10 days after award of contract.
- .3 Quality Control:
 - .1 Provide equipment and material from manufacturer's regular production, CSA certified, manufactured to standard quoted plus additional specified requirements.
 - .2 Where CSA certified equipment is not available submit such equipment to inspection authorities for special inspection and approval before delivery to site.
 - .3 Submit proof of compliance to specified standards with shop drawings and product data in accordance with Section 25 05 02 - EMCS: Shop Drawings, Product Data and Review Process. Label or listing of specified organization is acceptable evidence.
 - .4 In lieu of such evidence, submit certificate from testing organization, approved by Departmental Representative , certifying that item was tested in accordance with their test methods and that item conforms to their standard/code.
 - .5 For materials whose compliance with organizational standards/codes/specifications is not regulated by organization using its own listing or label as proof of compliance, furnish certificate stating that material complies with applicable referenced standard or specification.
 - .6 Permits and fees: in accordance with general conditions of contract.
 - .7 Submit certificate of acceptance from authority having jurisdiction to Departmental Representative .
 - .8 Existing devices intended for re-use: submit test report.

1.6 QUALITY ASSURANCE

- .1 Provide record of successful previous installations submitting tender showing experience with similar installations utilizing computer-based systems.
- .2 Have access to local supplies of essential parts and provide 7 year guarantee of availability of spare parts after obsolescence.
- .3 Ensure qualified supervisory personnel continuously direct and monitor Work and attend site meetings.
- .4 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .5 Sustainable Requirements:
 - .1 Construction requirements: in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

- .2 Verification: contractor's verification in accordance with Section 01 33 29 - Sustainable Design Reporting.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Material Delivery Schedule: provide Departmental Representative with schedule within 2weeks after award of Contract.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 00 10 – General Instructions.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
 - .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan.
 - .5 Place materials defined as hazardous or toxic in designated containers.
 - .6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.
 - .7 Label location of salvaged material's storage areas and provide barriers and security devices.
 - .8 Ensure emptied containers are sealed and stored safely.
 - .9 Fold up metal and plastic banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 EQUIPMENT

- .1 There is an existing BAS presently installed in the building. All materials must be selected to ensure compatibility with the existing BAS.
- .2 Complete list of equipment and materials to be used on project and forming part of tender documents by adding manufacturer's name, model number and details of materials, and submit for approval.

2.2 ADAPTORS

- .1 Provide adaptors between metric and imperial components.

Part 3 Execution

3.1 MANUFACTURER'S RECOMMENDATIONS

- .1 Installation: to manufacturer's recommendations.

3.2 PAINTING

- .1 Painting:
 - .1 Clean and touch up marred or scratched surfaces of factory finished equipment to match original finish.
 - .2 Restore to new condition, finished surfaces too extensively damaged to be primed and touched up to make good.
 - .3 Clean and prime exposed hangers, racks, fastenings, and other support components.
 - .4 Paint unfinished equipment installed indoors to EEMAC 2Y-1

3.3 FIELD QUALITY CONTROL

- .1 Verification requirements:
 - .1 Materials and resources.
 - .2 Storage and collection of recyclables.
 - .3 Construction waste management.
 - .4 Resource reuse.
 - .5 Recycled content.
 - .6 Local/regional materials.
 - .7 Certified Wood.
 - .8 Low-emitting materials.

END OF SECTION