

## **PART 1 - GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Materials, equipment and installation method associated with wet pipe sprinkler systems for heated areas.

### **1.2 RELATED SECTIONS**

- .1 Section 21 00 00/26 00 00 – Specific Conditions – Mechanical/Electrical.
- .2 Section 23 05 29 – Hangers and Supports for HVAC Piping and Equipment.
- .3 Section 23 05 49.01 – Seismic Restraint Systems.

### **1.3 REFERENCES**

- .1 Unless otherwise indicated, all the works must be done in accordance with the latest edition of the Quebec Construction Code (QCC), the Quebec Safety Code and municipal regulations.
- .2 Furthermore, works must be carried out in accordance with any other code or standard having jurisdiction, as per the latest edition, including, but not limited to:
  - .1 American National Standards Institute (ANSI) / American Petroleum Institute (API).
    - .1 ANSI/API Spec 5L, Specification for Line Pipe.
  - .2 American National Standards Institute / National Fire Protection Association (ANSI/NFPA).
    - .1 ANSI/NFPA 13, Installation of Sprinkler Systems.
  - .3 American Society for Testing and Material (ASTM).
    - .1 ASTM A-47M, Standard Specification for Ferritic Malleable Iron Castings.
    - .2 ASTM A-53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
    - .3 ASTM A-135, Standard Specification for Electric-Resistance-Welded Steel Pipe.
  - .4 Canadian Standards Association (CSA) / CSA International.

**Rev. 00: Issued for tender (2013-11-19)**

- .1 CSA B242, Groove and Shoulder Type Mechanical Pipe Couplings.
- .2 CSA W47.1, Certification of Companies for Fusion Welding of Steel.
- .3 CAN/CSA B64.10-01, Manual for the Selection and Installation of Backflow Prevention Devices.
- .5 Electrical Equipment Manufacturers Association of Canada (EEMAC).
- .6 National Research Council Canada (NRC).
  - .1 National Building Code (NBC).
  - .2 National Fire Code (NFC).
  - .3 National Plumbing Code (NPC).
- .7 Underwriters Laboratories of Canada (ULC).
  - .1 CAN/ULC S543, Internal Lug Quick Connect Coupling for Fire Hose.
- .8 National Fire Protection Association (NFPA).
  - .1 NFPA 25, Inspection, Testing and Maintenance of Water-Based Fire Protection Systems.
  - .2 NFPA 30, Flammable and Combustible Liquids Code.
  - .3 NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals.
  - .4 NFPA 170, Standard for Fire Safety and Emergency Symbols.
  - .5 NFPA 291, Fire Flow Testing and Marking of Hydrants.
- .9 City of Sept-Îles.
  - .1 Municipal fire safety regulations.
- .10 Human Resources and Skills Development Canada (HRSDC).
  - .1 FC 403, Standard for Fire Sprinkler Systems.
- .11 Health Canada / Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material safety data sheets (MSDS).
- .12 Treasury Board Secretariat.

**Rev. 00: Issued for tender (2013-11-19)**

- .1 Chapter 3-3, Fire Safety Standard for Electronic Data Processing Equipment.
- .2 Chapter 3-6, Fire Safety Standard for Correctional Institutions.

#### **1.4 SUBMITTALS**

- .1 Submit all documents and samples required in Section 21 00 00/26 00 00 – Specific Conditions – Mechanical/Electrical.
- .2 Submit hydraulic calculation sheets and installation plans in accordance with execution drawings and calculation criteria prescribed in ANSI/NFPA 13. Provide hydraulic calculations for more hydraulically challenging areas, for higher risk zones and as indicated.
- .3 Hydraulic calculations and installation plans shall be signed and sealed by an engineer who is a member of the Ordre des ingénieurs du Québec.

#### **1.5 CLOSEOUT SUBMITTALS**

- .1 Submit all required closeout submittals and integrate them into the "Operating and Maintenance Manual", according to Section 21 00 00/26 00 00 – Specific Conditions – Mechanical/Electrical.
- .2 Product data:
  - .1 Provide data must include:
    - .1 Manufacturer's Catalogue Data, including specific model, type, and size for:
      - .1 Pipes and fittings;
      - .2 Sprinkler heads;
      - .3 Pipe hangers and supports.
    - .2 Operating and maintenance details;
    - .3 A list of recommended spare parts.
  - .2
  - .3
- .3 Provide a copy of NFPA 25 standard "Inspection, Testing and Maintenance of Water Based Fire Protection Systems" and incorporate into the "Operating and Maintenance Manual".

**Rev. 00: Issued for tender (2013-11-19)**

## **1.6 SPARE AND MAINTENANCE PARTS**

- .1 Provide spare and maintenance parts as indicated.
- .2 Provide spare sprinklers and tools in accordance with ANSI/NFPA 13.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- .1 All products used in the installation of firefighting measures shall be cUL, ULC or FM certified and labelled as such.
- .2 Include accessories capable of supporting the normal pressure exerted in the fire safety system.

### **2.2 PIPES AND FITTINGS**

- .1 Pipes:
  - .1 Pipe that is NPS 2 or less:
    - .1 Black steel, Schedule 40 pipe, threaded or grooved, in accordance with ANSI/NFPA 13 and ASTM A-53 or ASTM A-135 standards.
  - .2 Acceptable products: Allied; Bull Moose.
- .2 Fittings and seals in accordance with ANSI/NFPA 13:
  - .1 Use fittings and seals with galvanized finish when using galvanized pipe.
  - .2 Fittings and seals NPS 2 or less:
    - .1 Rigid seals and fittings, supplied by the same manufacturer.
    - .2 Threaded fittings with Teflon tape, in accordance with standard ASTM A-47M, Grade 32510.
    - .3 Pipe seals with grooved ends, standard couplings in accordance with standard CSA B242 and standard ANSI/API Spec 5L.
    - .4 Fittings with grooved ends, in accordance with standard ASTM A-536, Grade 65-45-12.
  - .3 Acceptable products:

**Rev. 00: Issued for tender (2013-11-19)**

- .1 Fittings: Victaulic Firelock or EZ Firelock; Gruvlock, Rigidlite, 7400 series.
- .2 Seals: Victaulic Vic-plus or Flushseal; Gruvlock.

## **2.3 HANGERS**

- .1 For fire protection services in accordance with ANSI/NFPA 13 standard.
- .2 Refer to sections 23 05 29 and 23 05 49.01.

## **2.4 SPRINKLER HEADS**

- .1 General: to ANSI/NFPA 13 listed for fire protection services.
- .2 Steel sprinkler guards with zinc chromate finish to protect sprinkler heads located in areas susceptible to mechanical damage:
  - .1 Acceptable products: Tyco, models G1 and G4.
- .3 Pendent sprinklers:
  - .1 Semi-recessed pendent sprinklers, with semi-recessed escutcheons; standard response, [friable bulb] [fusible link], K-factor:  $80.6 \text{ L/min}/(\text{Bar})^{1/2}$  (5.6 gal US/min/(lb./ sq. in.)<sup>1/2</sup>):
    - .1 Acceptable products:
      - .1 Standard response sprinklers: Viking Micromatic, Model M, VK-102; Victaulic V2707; Gem.
  - .2 Flush mount pendent, standard response, [friable bulb] [fusible link], K-factor:  $80.6 \text{ L/min}/(\text{Bar})^{1/2}$  (5.6 gal US/min/(lb./ sq. in.)<sup>1/2</sup>). Finish and colour of blanking plate to be chosen by the Architect:
    - .1 Acceptable products:
      - .1 Standard response sprinklers: Viking Horizon-Mirage, Model B-2, VK-405; Victaulic, Style V3801; Gem, Model A; Globe.
  - .3 Pendent sprinklers, standard response, [friable bulb] [fusible link], K-factor de  $80.6 \text{ L/min}/(\text{Bar})^{1/2}$  (5.6 gal US/min/(lb./ sq. in.)<sup>1/2</sup>):
    - .1 Acceptable products:
      - .1 Standard response sprinklers: Viking Micromatic, Model M, VK-102; Victaulic V2707; Gem.

**Rev. 00: Issued for tender (2013-11-19)**

- .4 Activation temperature: 68°C (155°F), 93°C (200°F), 141°C (286°F), as required.
- .5 Finishes: bronze, brass, chrome, polyester, colour to be chosen by the Architect, as indicated in the plans.
- .6 Maximum coverage per sprinkler head:
  - .1 Low risk:
    - .1 Non-combustible construction: 20.9 m<sup>2</sup> (225 sq. ft.).
    - .2 Combustible construction: 12.1 m<sup>2</sup> (130 sq. ft.).
  - .2 Normal risk: 12.1 m<sup>2</sup> (130 sq. ft.).
  - .3 High risk: 9.3 m<sup>2</sup> (100 sq. ft.).

## **2.5 SPARE PARTS CABINET**

- .1 Provide cabinets to store maintenance equipment, special tools and extra sprinkler heads, including sprinkler head wrench, adjacent to each alarm valve. There must be at least one of each type of sprinkler. Number and types of extra sprinkler heads as specified in ANSI/NFPA 13 standard.
- .2 Cabinets built in accordance with the standards of sprinkler system manufacturers.
  - .1 Acceptable products: Victaulic, model SA1-000-0000; Tyco.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- .1 Install, inspect and test to acceptance in accordance with ANSI/NFPA 13 standard.
- .2 Conduct installation in accordance with set standards and with the requirements of current legislation, regulations, standards and codes.
- .3 Install a factory-painted sprinkler guard on pendent sprinklers inside cupboards and/or underneath obstacles 1,200 mm wide or more.

### **3.2 TRAINING**

- .1 The Contractor shall provide and organize a [two-hour] training session for operational and building maintenance personnel, in the presence of the Owner or the Owner's representative.

**Rev. 00: Issued for tender (2013-11-19)**

- .2 Training shall include regular operations, emergency directives and system maintenance in accordance with the NFPA 25 standard.

### **3.3 TESTS AND VERIFICATIONS**

- .1 Perform the following tests according to ANSI/NFPA 13 standard:
  - .1 Hydrostatically test each system at 1,380 kPa (200 lb./sq. in.) for a two (2) hour period.
  - .2 For the parts of the sprinkler systems where the operating pressure exceeds 1,034 kPa (150 lb./sq. in.), conduct hydrostatic tests for a period of two (2) hours at an additional 345 kPa (50 lb./sq. in.) over and above the operating pressure.
  - .3 Conduct a flow test using the test valve in each area to verify that flow switches are functioning properly. The alarm signal shall reach the fire alarm control panel within one (1) minute of the opening of the test valve and throughout the entire duration of the flow.
  - .4 Conduct a flow test with the alarm test valve fully open to ensure that there is no pressure buildup in the drain system, which would prevent the system from functioning properly.
  - .5 Conduct full opening and full closing tests on all control valves in the sprinkler system whenever the system is subjected to water supply pressure.
  - .6 Conduct tests on pressure-reducing valves to ensure proper functioning during static and flow conditions.
  - .7 Conduct a flow test on backflow prevention devices to check that they are functioning properly. Minimum test flow shall be equal to the flow prescribed by sprinkler system demand requirements.
- .2 Testing to be witnessed by authorities having jurisdiction or the Engineer. Provide test certificates as required by ANSI/NFPA 13 standard.
- .3 The Contractor shall obtain a testing certificate in accordance with CAN/CSA B64.10-01 for every backflow prevention device that has been installed.

### **3.4 SPECIAL REQUIREMENTS – OCCUPIED BUILDINGS**

- .1 Protect occupants' furnishings and effects using polyethylene film.
- .2 As work progresses, notify the Owner of the order in which work will be performed and in which premises.

**Rev. 00: Issued for tender (2013-11-19)**

- .3 Coordinate with Division 26 to ensure there is proper lighting for the duration of project once ceilings and lights have been dismantled, particularly in hallways and exits.

### **3.5 REPORT AND CERTIFICATE**

- .1 At the end of the project, submit an inspection report and proof of inspection to the Engineer in addition to the materials and test certificate duly completed and signed. Attach to the inspection report all test results, properly documented in a binder.

### **3.6 CLEANING**

- .1 Perform cleaning work in accordance with Section 21 00 00/26 00 00 – Specific Conditions – Mechanical/Electrical.

**END OF SECTION**

**Rev. 00: Issued for tender (2013-11-19)**