

**PART 1 - GENERAL****1.1 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Closeout Submittals:
  - .1 Site records:
    - .1 Departmental Representative will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.
    - .2 Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.
    - .3 Use different colour waterproof ink for each service.
    - .4 Make available for reference purposes and inspection.
  - .2 As-built drawings:
    - .1 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
    - .2 Submit to Departmental Representative for approval and make corrections as directed.
    - .3 Perform testing, adjusting and balancing for HVAC using as-built drawings.
    - .4 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

**1.2 DELIVERY, STORAGE, AND HANDLING**

- .1 Waste Management and Disposal:
  - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**PART 2 - PRODUCTS****2.1 NOT USED**

- .1 Not used.

**PART 3 - EXECUTION****3.1 CLEANING**

- .1 Clean interior and exterior of all systems including strainers. Vacuum interior of ductwork and air handling units.

**3.2 PROTECTION**

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

**PART 1 - GENERAL****1.1 REFERENCES**

- .1 National Fire Prevention Association (NFPA)
  - .1 NFPA (Fire) 13, Standard for the Installation of Sprinkler Systems, 2013 Edition.
  - .2 NFPA (Fire) 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2011 Edition.
- .2 Underwriter's Laboratories of Canada (ULC).

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

**PART 2 - PRODUCTS****2.1 DESIGN REQUIREMENTS**

- .1 Design and provide each system to give full consideration to blind spaces, piping, electrical equipment, ducts, and other construction and equipment.
- .2 Locate sprinkler heads in consistent pattern with ceiling grid, lights, and air supply diffusers.
- .3 Devices and equipment for fire protection service: ULC approved for use in wet pipe sprinkler systems.
- .4 Location of Sprinkler Heads:
  - .1 Locate heads in relation to ceiling and spacing of sprinkler heads not to exceed that permitted by NFPA (Fire) 13 for light hazard occupancy.
  - .2 Uniformly space sprinklers on branch.
- .5 Water Distribution:
  - .1 Make distribution uniform throughout the area in which sprinkler heads will open.
- .6 Density of Application of Water:
  - .1 Size pipe to provide specified density when system is discharging specified total maximum required flow.

**2.2 ABOVE GROUND PIPING SYSTEMS**

- .1 Provide fittings for changes in direction of piping and for connections.
    - .1 Make changes in piping sizes through tapered reducing pipe fittings, bushings will not be permitted.
  - .2 Perform welding in shop; field welding will not be permitted.
  - .3 Conceal piping in areas with suspended ceiling.
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### 2.3 PIPE, FITTINGS AND VALVES

- .1 Pipe:
  - .1 Ferrous: to Schedule 40.
- .2 Fittings and joints to NFPA (Fire) 13:
  - .1 Ferrous: screwed, welded, flanged or roll grooved.
    - .1 Grooved joints designed with two ductile iron housing segments, pressure responsive gasket, and zinc-electroplated steel bolts and nuts. Cast with offsetting angle-pattern bolt pads for rigidity and visual pad-to-pad offset contact.
  - .2 Provide welded, threaded or grooved-end type fittings into which sprinkler heads, sprinkler head riser nipples, or drop nipples are threaded.
  - .3 Plain-end fittings with mechanical couplings and fittings which use steel gripping devices to bite into pipe when pressure is applied will not be permitted.
  - .4 Rubber gasketed grooved-end pipe and fittings with mechanical couplings are permitted in pipe sizes 32 mm and larger.
  - .5 Fittings: ULC approved for use in wet pipe sprinkler systems.
  - .6 Ensure fittings, mechanical couplings, and rubber gaskets are supplied by same manufacturer.
  - .7 Side outlet tees using rubber gasketed fittings are not permitted.
  - .8 Sprinkler pipe and fittings: metal.
- .3 Pipe hangers:
  - .1 ULC listed for fire protection services in accordance with NFPA.

### 2.4 SPRINKLER HEADS

- .1 General: to NFPA (Fire) 13 and ULC listed for fire services.

### 2.5 SEMI-RECESSED SPRINKLER

- .1 Semi-recessed pendant, quick response for hazard coverage as indicated, 5.6 K factor, adjustable escutcheon, chrome finish, glass bulb type; 68°C rated, 13 mm orifice.

### 2.6 UPRIGHT SPRINKLER

- .1 Upright bronze, quick response for hazard coverage as indicated, 5.6 K factor, chrome finish, glass bulb type; 68°C rated, 13 mm orifice.

## **PART 3 - EXECUTION**

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.
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### 3.2 INSTALLATION

- .1 Install, inspect and test to acceptance in accordance with NFPA (Fire) 13 and NFPA (Fire) 25.

### 3.3 PIPE INSTALLATION

- .1 Install piping straight and true to bear evenly on hangers and supports. Do not hang piping from plaster ceilings.
- .2 Keep interior and ends of new piping and existing piping thoroughly cleaned of water and foreign matter.
- .3 Keep piping systems clean during installation by means of plugs or other approved methods. When work is not in progress, securely close open ends of piping to prevent entry of water and foreign matter.
- .4 Inspect piping before placing into position.

### 3.4 FIELD QUALITY CONTROL

- .1 Site Test, Inspection:
  - .1 Perform test to determine compliance with specified requirements in presence of Departmental Representative.
  - .2 Test, inspect, and approve piping before covering or concealing.
- .3 Preliminary Tests:
  - .1 Hydrostatically test each system at normal system pressure for a 2 hour period with no leakage or reduction in pressure.
  - .2 When tests have been completed and corrections made, submit signed and dated certificate in accordance with NFPA 13.