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**Part 1            General**

**1.1            ACTION AND INFORMATIONAL SUBMITTALS**

- .1      Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2      Product Data:
  - .1          Submit manufacturer's instructions, printed product literature and data and include product characteristics, performance criteria, physical size, finish and limitations.
- .3      Shop Drawings:
  - .1          Indicate on drawings:
    - .1              Mounting arrangements.
    - .2              Operating and maintenance clearances.

**1.2            CLOSEOUT SUBMITTALS**

- .1      Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2      Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.
  - .1          Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
  - .2          Maintenance data to include:
    - .1              Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
    - .2              Data to include schedules of tasks, frequency, tools required and task time.
  - .3          Performance data to include:
    - .1              Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
    - .2              Equipment performance verification test results.
    - .3              Special performance data as specified.
  - .4          Approvals:
    - .1              Submit 2 copies of draft Operation and Maintenance Manual to Departmental Representative for approval. Submission of individual data will not be accepted unless directed by Departmental Representative.
  - .5          Additional data:
    - .1              Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.
  - .6          Site records:
    - .1              Departmental Representative will provide 1 set of reproducible mechanical drawings. Provide sets of 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 to reproducibles, revising reproducibles to show work as actually installed.

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- .3 Use different colour waterproof ink for each service.
  - .4 Make available for reference purposes and inspection.
  - .7 As-Built drawings:
    - .1 Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.
    - .2 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).
    - .3 Submit to Departmental Representative for approval and make corrections as directed.
    - .4 Perform testing, adjusting and balancing for HVAC using as-built drawings.
    - .5 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.
  - .8 Submit copies of as-built drawings for inclusion in final TAB report.

### **1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 NOT USED**

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

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**3.2 PAINTING REPAIRS AND RESTORATION**

- .1 Do painting in accordance with Section.
- .2 Restore to new condition, finishes which have been damaged.

**3.3 SYSTEM CLEANING**

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

**3.4 FIELD QUALITY CONTROL**

- .1 Site Tests: conduct following tests in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .2 Manufacturer's Field Services:
  - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
  - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

**3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**3.6 PROTECTION**

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

**END OF SECTION**



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**Part 1            General**

**1.1            REFERENCE STANDARDS**

- .1    National Fire Prevention Association (NFPA)
  - .1       NFPA 13, Standard for the Installation of Sprinkler Systems.
  - .2       NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.
- .2    Underwriter's Laboratories of Canada (ULC)
  - .1       CAN4 S543, Standard for Internal Lug Quick Connect Couplings for Fire Hose.

**Part 2            Products**

**2.1            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.

**2.2            PIPE, FITTINGS AND VALVES**

- .1    Pipe:
  - .1       Ferrous: to NFPA 13.
  - .2       Copper tube: to NFPA 13.
- .2    Fittings and joints to NFPA 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       Copper tube: screwed, soldered, brazed, grooved.
  - .3       Provide threaded fittings into which sprinkler heads, sprinkler head riser nipples, or drop nipples are threaded.
  - .4       Fittings: ULC approved for use in wet pipe sprinkler systems.
  - .5       Side outlet tees using rubber gasketed fittings are not permitted.
  - .6       Sprinkler pipe and fittings: metal.
- .3    Pipe hangers:
  - .1       ULC listed for fire protection services in accordance with NFPA.

**2.3            SPRINKLER HEADS**

- .1    General: to NFPA 13 and ULC listed for fire services.
- .2    Sprinkler Head Type:
- .3    Provide nominal 1.2 cm orifice sprinkler heads.

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**2.4 ESCUTCHEON PLATES**

- .1 Provide polished stainless steel plates in finished spaces.

**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.

**3.2 INSTALLATION**

- .1 Install, inspect and test to acceptance in accordance with NFPA 13 and NFPA 25.
- .2 A relocated sprinkler head is a new head.

**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.

**END OF SECTION**