PART 1 - GENERAL

1.1 SUBMITTALS

.1 Shop drawings to show:
- .1 Operating and maintenance clearances.

.2 Shop drawings and product data accompanied by:
- .1 Acoustical sound power data, where applicable.
- .2 Points of operation on performance curves.
- .3 Certification of compliance to applicable codes.

.3 Closeout Submittals:
- .1 Operation and maintenance manual approved by, and final copies deposited with, Contract Administrator before final inspection.
- .2 Operation data to include:
  - .1 Control schematics for systems including environmental controls.
  - .2 Description of systems and their controls.
  - .3 Description of operation of systems at various loads together with reset schedules and seasonal variances.
  - .4 Operation instruction for systems and component.
  - .5 Description of actions to be taken in event of equipment failure.
  - .6 Valves schedule and flow diagram.
  - .7 Colour coding chart.
- .3 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.
- .4 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 Testing, adjusting and balancing reports.
- .5 Approvals:
  - .1 Submit 2 copies of draft Operation and Maintenance Manual to Contract Administrator for approval. Submission of individual data will not be accepted unless directed by Contract Administrator.
  - .2 Make changes as required and re-submit as directed by Contract Administrator.
- .6 Additional data:
  - .1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.

1.2 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal:

PART 3 - EXECUTION

3.1 PAINTING REPAIRS AND RESTORATION

.1 Prime and touch up marred finished paintwork to match original.

.2 Restore to new condition, finishes which have been damaged.

3.2 CLEANING

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

3.3 DEMONSTRATION

.1 Contract Administrator use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.

.2 Trial usage to apply to following equipment and systems:
.1 Ventilation system.

.3 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.

.4 Use operation and maintenance manual, and audio visual aids as part of instruction materials.

.5 Instruction duration time requirements as specified in appropriate sections.

3.4 PROTECTION

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

END

PART 1 - GENERAL

1.1 REFERENCES

.1 American National Standards Institute/National Fire Protection Association (ANSI/NFPA)
.1 ANSI/NFPA 13-2002 Select Edition, Standard for the Installation of Sprinkler Systems.
.2 ANSI/NFPA 25-2002 Select Edition, Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems.

1.2 SUBMITTALS

.1 Shop Drawings:
.1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
.2 Instructions: submit manufacturer's installation instructions.

.2 Closeout Submittals:.
.1 Provide detailed hydraulic calculations including: summary sheet, Contractor's Material and Test Certificate for aboveground and underground piping, as well as other deliverables.

1.3 QUALITY ASSURANCE

.1 Qualifications:
.1 Installer: company or person specializing in dry sprinkler systems with documented experience.

1.4 ENGINEERING DESIGN CRITERIA

.1 Design system in accordance with ANSI/NFPA 13, using following parameters:
.1 Hazard:
.1 To suit occupancy as indicated.
.2 Pipe size and layout:
.1 Hydraulic design or pipe schedule sizing design.
.2 Sprinkler head layout: to ANSI/NFPA.
.3 Water supply:
.1 Conduct flow and pressure test of water supply in vicinity of project to obtain criteria for bases of design in accordance with ANSI/NFPA 13.

PART 2 - PRODUCTS

2.1 PIPE, FITTINGS AND VALVES

.1 Pipe:
- .1 Ferrous: to ANSI/NFPA 13.
- .2 Copper tube: to ANSI/NFPA 13.

.2 Fittings and joints to ANSI/NFPA 13:
- .1 Ferrous: screwed, welded, flanged or roll grooved.
- .2 Copper tube: screwed, soldered, brazed.

.3 Auxiliary valves:
- .1 ULC listed for fire protection service.
- .2 Up to NPS 2: bronze, screwed ends, OS & Y gate.
- .3 NPS 2 1/2 and over: cast iron, flanged or roll grooved ends, indicating butterfly valve.
- .4 Swing check valves.
- .5 Ball drip.
- .6 Tamper devices wired back to fire alarm panel.

.4 Pipe hangers:
- .1 ULC listed for fire protection services.

2.2 SPRINKLER HEADS

.1 General: to ANSI/NFPA 13 and ULC listed for fire services.

2.3 SPRINKLER HEAD TYPE A

.1 Upright bronze.

2.4 SPRINKLER HEAD TYPE B

.1 Pendant chrome link and lever type.

2.5 SPRINKLER HEAD TYPE C

.1 Pendant chrome glass bulb type.

2.6 SPRINKLER HEAD TYPE D

.1 Recessed polished satin chrome glass bulb fusible link type with ring and cup.

2.7 SPRINKLER HEAD TYPE E

.1 Flush polished satin chrome link and lever type.

2.8 SPRINKLER HEAD TYPE F

.1 Side wall polished satin chrome link and lever type.

2.9 AUXILIARY SUPERVISORY SWITCHES

.1 General: to ANSI/NFPA 13 and ULC listed for fire service.

.2 Valves:
.1 Mechanically attached to valve body, with normally open and normally closed contacts and supervisory capability.

.3 Flow switch type:
.1 With normally open and normally closed contacts and supervisory capability.

.4 Pressure alarm switch:
.1 With normally open and normally closed contacts and supervisory capability.

2.10 FIRE DEPARTMENT CONNECTION

.1 To ANSI/NFPA 13 and ULC listed, siamese type, location as indicated. Thread specifications to be compatible with local fire department.

.2 Polished bronze or chrome plated, exposed with identifying sign cast on plate. Threaded metal caps and chains.

2.11 DRY PIPE VALVE

.1 ULC listed.

.2 Cast iron, flanged type, sized to suit water main.

.3 Components:
.1 Accelerator.
.2 Air maintenance device with low pressure alarm.
.3 Alarm pressure switch with supervisory capability.
.4 Pressure gauges.
.5 Drain valve.
.6 Test valve with associated piping.
.7 Shut off valve - OS & Y with tamper-proof device wired back to fire alarm panel.

2.12 COMPRESSED AIR SUPPLY

.1 Automatic Air Compressor.

.2 ULC listed.

.3 Capacity:
.1 To restore normal air pressure in system within 30 minutes.
.2 To provide air pressure in accordance with instruction sheet furnished with dry pipe valve.

.4 Piping: ferrous, NPS 3/4 screwed joints and fittings, to ANSI/NFPA 13.

2.13 PRESSURE GAUGES

.1 Maximum limit of not less than twice normal working pressure at point where installed.

2.14 RELIEF VALVE

.1 ULC listed.

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 ANSI/NFPA 13 and NFPA 25.

.2 Testing to be witnessed by authority having jurisdiction.

.3 Install fire department connections as indicated.

.4 Pressure gauges:
- .1 Location:
  - .1 On water side and air side of dry pipe valve.
  - .2 At air receiver.
  - .3 In each independent pipe from air supply to dry pipe valve.
  - .4 At exhausters and accelerators.
- .2 Install to permit removal.
- .3 Locate so as not subjected to freezing.

.5 Valve identification:
- .1 Identify drain valve, by-pass valves and main shut-off valve and all auxiliary valves.

3.3 CLEANING

.1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END