PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

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

.3 Shop drawings and product data accompanied by:
- .1 Detailed drawings of bases, supports, and anchor bolts.
- .2 Acoustical sound power data, where applicable.
- .3 Points of operation on performance curves.
- .4 Manufacturer to certify current model production.
- .5 Certification of compliance to applicable codes.

.4 Closeout Submittals:
- .1 Provide operation and maintenance data for incorporation into manual.
- .2 Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
- .3 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.
- .4 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.
- .5 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 as specified in Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.

.6 Approvals:
.1 Submit digital copy of draft Operation and Maintenance Manual to Departmental Representative for approval. Submission of individual data will not be accepted unless directed by Departmental Representative.
.2 Make changes as required and re-submit as directed by Departmental Representative.

.7 Additional data:
.1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.

.8 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.

.9 Submit copies of as-built drawings for inclusion in final TAB report.

1.2 MAINTENANCE

.1 Furnish spare parts as follows:
.1 One set of packing for each pump.
.2 One casing joint gasket for each size pump.
.3 One glass for each gauge glass.
.4 One filter cartridge or set of filter media for each filter or filter bank in addition to final operating set.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal:
.1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling.

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 FIELD QUALITY CONTROL

.1 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 - 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 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.4 DEMONSTRATION

.1 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.

.2 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.

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

3.5 PROTECTION

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

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 National Fire Prevention Association (NFPA)
.1 NFPA 13-2013, Standard for the Installation of Sprinkler Systems.
.2 NFPA 25-2014, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Provide manufacturer's printed product literature and data sheets, and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
.1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Prince Edward Island.
.2 Indicate:
.1 Materials.
.2 Finishes.
.3 Method of anchorage
.4 Number of anchors.
.5 Supports.
.6 Reinforcement.
.7 Assembly details.
.8 Accessories.

1.3 CLOSEOUT SUBMITTALS

.1 Provide operation, maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals in accordance with ANSI/NFPA 20.

.2 Manufacturer's Catalog Data, including specific model, type, and size for:
.1 Pipe and fittings.
.2 Pipe hangers and supports.
.3 Pressure or flow switch.
.4 Fire department connections.
.5 Mechanical couplings.

.3 Drawings:

.1 Piping system layout.
.1 Prepare 760 mm by 1050 mm detail working drawings of system layout in accordance with NFPA 13, "Working Drawings (Plans)".
.2 Show data essential for proper installation of relocated fire department connection.
.3 Show details, plan view, elevations, and sections of systems supply and piping.
.4 Show piping schematic of systems supply, devices, valves, pipe, and fittings.

.4 Design Data:
.1 Indicate type and design of each system and certify that each system has performed satisfactorily in the manner intended for not less than 18 months.

.5 Field Test Reports:
.1 Preliminary tests on piping system.

.6 Records:
.1 As-built drawings of each system.
.1 After completion, but before final acceptance, submit complete set of as-built drawings of each system for record purposes.
.2 Submit 760 mm by 1050 mm drawings on reproducible Mylar film with title block similar to full size contract drawings.

.7 Operation and Maintenance Manuals:
.1 Provide Material and Test Certificate for aboveground piping and other documentation for incorporation into manual in accordance with NFPA 13.

1.4 QUALITY ASSURANCE

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

.2 Supply grooved joint couplings, fittings, valves, grooving tools and specialities from a single manufacturer. Use date stamped castings for coupling housings, fittings, valve bodies, for quality assurance and traceability.

1.5 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials:
.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

PART 2 - PRODUCTS

2.1 DESIGN REQUIREMENTS

.1 Design automatic wet pipe fire suppression systems in accordance with required and advisory provisions of NFPA 13.

.2 Include with each system materials, accessories, and equipment inside and outside building to provide each system complete and ready for use.

.3 Design and provide each system to give full consideration to blind spaces, piping, electrical equipment, ducts, and other construction and equipment in accordance with detailed shop drawings.

.4 Devices and equipment for fire protection service: ULC approved for use in wet pipe sprinkler systems.

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.

2.3 PIPE, FITTINGS AND VALVES

.1 Pipe:
.1 Ferrous: 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 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.

.3 Rubber gasketted grooved-end pipe and fittings with mechanical couplings are permitted in pipe sizes 32 mm and larger.

.4 Fittings: ULC approved for use in wet pipe sprinkler systems.

.5 Ensure fittings, mechanical couplings, and rubber gaskets are supplied by same manufacturer, and must match existing system.

.6 Side outlet tees using rubber gasketted fittings are not permitted.

.7 Sprinkler pipe and fittings: metal.

.3 Valves:

.1 ULC listed for fire protection service.

.2 Gate valves: open by counterclockwise rotation.

.3 Check valves: flanged clear opening swing or spring actuated check type with flanged inspection and access cover plate for sizes 10 cm and larger.

.4 Pipe hangers:

.1 ULC listed for fire protection services in accordance with NFPA.

2.4 SUPERVISORY SWITCHES

.1 General: to 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 Pressure or flow switch type:

.1 With normally open and normally closed contacts and supervisory capability.

.2 Provide switch with circuit opener or closer for automatic transmittal of alarm over facility fire alarm system.

.3 Connect into building fire alarm system.
.4 Alarm actuating device: mechanical diaphragm controlled retard device adjustable from 10 to 60 seconds and instantly recycle.

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

2.5 FIRE DEPARTMENT CONNECTION

.1 Provide connections approximately 1.5 m above finish grade, location as indicated.

.2 Install a 90-degree elbow with drain connection at the low-point near each fire department connection to allow for system drainage to prevent freezing.

.3 Relocate existing fire department connection. If fire department is unsuitable for reuse then notify owner.

2.6 PIPE SLEEVES

.1 Provide pipe sleeves where piping passes through walls.

.2 Secure sleeves in position and location during construction.

.3 Provide sleeves of sufficient length to pass through entire thickness of walls.

.4 Provide 2.5 cm minimum clearance between exterior of piping and interior of sleeve or core-drilled hole.
.1 Firmly pack space with mineral wool insulation.
.2 Seal space at both ends of sleeve or core-drilled hole with plastic waterproof cement which will dry to firm but pliable mass.

.5 Sleeves in Masonry and Concrete Walls, Floors, and Roofs:
.1 Provide hot-dip galvanized steel, sleeves.
.2 Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in core-drilled hole are completely grouted smooth.

.6 Sleeves in Other Than Masonry and Concrete Walls, Floors, and Roofs:
.1 Provide 0.61 mm thick galvanized steel sheet.

2.7 ESCUTCHEON PLATES

.1 Provide one piece type metal plates for piping passing through walls in exposed spaces.

.2 Provide paint finish on metal plates in unfinished spaces.

2.8 SIGNS

.1 Attach properly lettered and approved metal signs to each valve and alarm device to NFPA 13.

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.

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 ELECTRICAL CONNECTIONS

.1 Provide electrical work associated with this section under Section 26 05 00 - Common Work Results for Electrical.

.2 Provide control and fire alarm wiring, including connections to fire alarm systems, in accordance with National Electrical Code.

.3 Provide wiring in rigid metal conduit or intermediate metal conduit.

3.5 CONNECTIONS TO EXISTING WATER SUPPLY SYSTEMS

.1 Notify Contracting Officer in writing at least 15 days prior to connection date.

.2 Use tapping or drilling machine valve and mechanical joint type sleeves for connections to be made under pressure.

.3 Bolt sleeves around main piping.

.4 Bolt valve to branch connection. Open valve, attach drilling machine, make tap, close valve, and remove drilling machine, without interruption of service.

.5 Furnish materials required to make connections into existing water supply systems, and perform excavating, backfilling, and other incidental labour as required.

3.6 FIELD PAINTING

.1 Clean, pretreat, prime, and paint new systems including valves, piping, conduit, hangers, supports, miscellaneous metalwork, and accessories.

.2 Apply coatings to clean, dry surfaces, using clean brushes.

.3 Clean surfaces to remove dust, dirt, rust, and loose mill scale.

.4 Immediately after cleaning, provide metal surfaces with 1 coat of pretreatment primer applied to minimum dry film thickness of 0.3 ml, and one coat of zinc chromate primer applied to minimum dry film thickness of 1.0 ml.

.5 Shield sprinkler heads with protective covering while painting is in progress.

.6 Upon completion of painting, remove protective covering from sprinkler heads.

.7 Remove sprinkler heads which have been painted and replace with new sprinkler heads.

.8 Provide primed surfaces with following:
.1 Piping in Unfinished Areas:
.1 Provide primed surfaces with one coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil in mechanical equipment room, and spaces where walls or ceiling are not painted or not constructed of a prefinished material.
.2 Provide piping with 50 mm wide red enamel bands spaced at maximum of 6 m intervals.

3.7 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 200 psig for a 2 hour period with no leakage or reduction in pressure.
.2 Flush piping with potable water in accordance with NFPA 13.
.3 Test alarms and other devices.
.4 Formal Tests and Inspections:
.1 Do not submit request for formal test and inspection until preliminary test and corrections are completed and approved.
.2 Submit written request for formal inspection at least 15 days prior to inspection date.
.3 Repeat required tests as directed.

.4 Correct defects and make additional tests until systems comply with contract requirements.
.5 Authority of Jurisdiction, will witness formal tests and approve systems before they are accepted.

END OF SECTION