

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Drawings and general provisions of the contract, including the "General Requirements" of Division 01, apply to this Section.
- .2 Parts of the fire alarm system in buildings 19 and 29, including smoke detectors, heat detectors and manual stations used to activate the pre-action fire protection system used to protect the ground floor, the level and the attic are part of the fire protection system. This work is the responsibility of the contractor for fire and / or fire protection systems (section 21 13 16 Automatic fire extinguishing system (pre-action)).

1.02 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data accompanied by:
 - .1 Detailed drawings of bases, supports, and anchor bolts.
 - .2 Points of operation on performance curves.
 - .3 Manufacturer to certify current model production.
 - .4 Certification of compliance to applicable codes.
- .3 Closeout Submittals:
 - .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .2 Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
 - .3 Operation data to include:
 - .1 Description of systems and their controls.
 - .2 Operation instruction for systems and component.
 - .3 Description of actions to be taken in event of equipment failure.
 - .4 Valves schedule and flow diagram.
 - .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.
 - .6 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.
 - .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 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.
 - .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.
 - .9 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 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

1.03 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.04 MAINTENANCE

- .1 Furnish spare parts in accordance with Section 01 78 00 - Closeout Submittals as follows:
 - .1 Two set of replacement filter for compressed air systems.
- .2 Provide one set of special tools required to service equipment as recommended by manufacturers and in accordance with Section 01 78 00 - Closeout Submittals.
- .3 Provide piping as described in item 1.9.2.5 of Section 01 78 00, which shall be delivered to the maintenance department for storage.

1.05 MATERIALS OR ACCEPTABLE PRODUCTS

- .1 When materials or products are prescribed by their trademark, see the Instructions to Bidders in order to know the procedure concerning the request for approval of replacement products.

1.06 TRANSPORT, STORAGE AND HANDLING

- .1 Transport, storage and handling of materials in accordance with Section 01 61 00 - General Product Requirements and Manufacturer's Written Instructions.
- .2 Coordinate material storage areas on site with Parks Canada representative.

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- .3 Delivery and Acceptance
 - .1 Deliver materials and materials to the site in their original packaging, which shall be labeled with the name and address of the manufacturer.
- .4 Storage and Protection
 - .1 Store materials in a dry place.
 - .2 Store materials under temperature and humidity conditions in accordance with manufacturer's recommendations and protect from weather.
- .5 Piping and all materials from decommissioning shall be temporarily stored, all in a manner that protects the environment on a Parks Canada designated area. This equipment must be evacuated from Grosse Île at the end of the work or within the timeframe of this bidder (to be coordinated with Parks Canada).

2 PRODUCTS

2.01 NOT USED

3 EXECUTION

3.01 PAINTING REPAIRS AND RESTORATION

- .1 Do painting in accordance with Section 09 91 99 - Painting.
- .2 Prime and touch up marred finished paintwork to match original.
- .3 Restore to new condition, finishes which have been damaged.

3.02 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 if required.
- .3 Provide hours of training for each of the systems in each building. These hours must appear within the timeframe requested in the documents for submission of the tender.
- .4 Departmental Representative will record these demonstrations on video tape for future reference. Coordination will be required between the contractor and the departmental representative to enable these records to be made.

3.03 PROTECTION

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

END OF SECTION

1 GENERAL

1.01 REFERENCES

- .1 National Fire Prevention Association (NFPA)
 - .1 NFPA 13-2016, Standard for the Installation of Sprinkler Systems.
 - .2 NFPA 25-2014, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.
- .2 Underwriter's Laboratories of Canada (ULC/cUL)

1.02 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 Samples:
 - .1 Submit samples of following:
 - .1 Each type of sprinkler head.
 - .2 Signs.
- .4 Test reports:
 - .1 Submit certified test reports for wet pipe fire protection sprinkler systems from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
- .5 Certificates:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Manufacturers' Instructions:
 - .1 Provide manufacturer's installation instructions.

1.03 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 13.
- .2 Manufacturer's Catalog Data, including specific model, type, and size for:
 - .1 Pipe and fittings.
 - .2 Alarm valves.
 - .3 Valves, including gate, check, and globe.
 - .4 Sprinkler heads.
 - .5 Pipe hangers and supports.
 - .6 Pressure or flow switch.
 - .7 Fire department connections.
 - .8 Mechanical couplings.

- .3 Field Test Reports:
 - .1 Preliminary tests on piping system.
- .4 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.
- .5 Operation and Maintenance Manuals:
 - .1 Provide maintenance data for incorporation into manual specified in Section 01 00 10 – General Requirements and other documentation for incorporation into manual in accordance with NFPA 13.

1.04 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in wet sprinkler systems.
- .2 Supply grooved joint couplings, fittings, valves, grooving tools and specialties from a single manufacturer. Use date stamped castings for coupling housings, fittings, valve bodies, for quality assurance and traceability.

1.05 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Provide spare sprinklers and tools in accordance with NFPA 13.

2 PRODUCTS

2.01 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 Welds must be factory-made by the manufacturer only; shop or field welding will not be permitted.

2.02 PIPE, FITTINGS AND VALVES

- .1 Pipe:
 - .1 Ferrous: to NFPA 13.
 - .2 For a minimum operating pressure of 1,200 kPa and maximum of 2,070 kPa.
 - .1 Piping to weld or groove by rolling :
 - .1 DN 150 mm and more: 10-gauge, ASTM A-135 and ASTM A-795, type E, grade A.
 - .2 Piping to thread or groove by cutting.
 - .1 Up to DN 100 mm: 40-gauge, ASTM A-135 and ASTM A-795, type E, grade A.
 - .3 Piping to thread or groove by cutting, thin-walled is not allowed.
 - .4 CPVC piping and steel piping less than 10-gauge are not acceptable.
 - .5 All piping must be approved for fire protection and marked with the manufacturer's name, the thickness of the walls (10, 40 gauge), and approval received as set out in standard NFPA 13.

- .6 Piping and fittings must be from a North American manufacturer. Any wall thickness diverging from North American standards is prohibited for this project.

Type of piping and schedule		
Building	Schedule 40 galvanized pipe	Schedule 40 black pipe
19 Hotel	Water entrance room (DN150 and more)	Water entrance room (up to DN100)
29 Desinfection	Water entrance room (DN150 and more)	Water entrance room (up to DN100)
32 Atelier	Water entrance room (DN150 and more)	Water entrance room (up to DN100)
100 Lazaret	Water entrance room (DN150 and more)	Water entrance room (up to DN100)
Water filtration factory	Water entrance room (DN150 and more)	Basement Ground floor (paint)

- .2 Fittings and joints to NFPA 13:
- .1 Ferrous: screwed or cut 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 or threaded 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 not permitted.
 - .5 Fittings: ULC approved for use in wet pipe sprinkler systems.
 - .6 Ensure fittings, mechanical couplings, and rubber gaskets are supplied by same manufacturer from a North American manufacturer. Any wall thickness diverging from North American standards is prohibited for this project.
 - .7 Side outlet tees using rubber gasketed fittings are not permitted.
 - .8 Sprinkler pipe and fittings: metal.
- .3 Valves:
- .1 ULC listed for fire protection service.
 - .2 Provide supervised butterfly valve as a main shut off valve beneath each alarm valve in each riser when more than one alarm valve is supplied from same water supply pipe.
- .4 Pipe hangers:
- .1 Hangers and hardware must be galvanized steel. They must be ULC listed for fire protection services in accordance with NFPA.

2.03 BACKFLOW PREVENTERS

- .1 Backflow preventers, ULC approved, consisting of two (2) self-acting check valves with closure ratios, and flexible seat stop valves at each end of the device and seat test valves Flexible localized.

- .2 Devices designed to be under constant pressure.
 - .1 The only acceptable products are:
 - 1. Wilkins model #350A;
 - 2. Watts model #757;
 - 3. Febco model #LF850.
 - 4. Materials and substitutes: Approved by addendum in accordance with instructions to bidders.

2.04 SPRINKLER HEADS

- .1 General: to NFPA 13 and ULC listed for fire services.
- .2 See legend to the plans for the characteristics of the heads.

2.05 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 Connection of switch: Section 28 31 00 - Fire Detection and Alarm.
 - .5 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.

2.06 PRESSURE GAUGES

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

2.07 BACKFLOW TEST CONNECTION

- .1 Provide connections approximately 1.5 m above finish grade, location as indicated.
- .2 Polished chrome plated recessed of approved two-way type with 2.5 inch National Standard female hose threads with plug, without clapper, chain, and identifying escutcheon plate.
- .3 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.

2.08 ESCUTCHEON PLATES

- .1 Provide split hinge type metal plates for piping passing through walls, floors, and ceilings in spaces with non visible piping.
- .2 Provide painted metal plates such as piping in places where piping is visible and painted.
- .3 Provide polished stainless steel plates where the piping is visible and unpainted.

2.09 SIGNS

- .1 Attach properly lettered Bilingual and approved metal signs to each valve and alarm device to NFPA 13.
- .2 Permanently fix hydraulic design data nameplates to riser of each system.

2.10 SPARE PARTS CABINET

- .1 Provide metal cabinet with extra sprinkler heads and sprinkler head wrench adjacent to each alarm valve. Number and types of extra sprinkler heads as specified in NFPA 13.

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

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

3.02 INSTALLATION

- .1 Install, inspect and test to acceptance in accordance with NFPA 13 and NFPA 25.
- .2 Prior to operation of the automatic sprinkler system, test the backflow prevention device as prescribed by NFPA 13 in addition to the B64 standard sealing test. Provide a written report of the tests performed as mentioned in this section.

3.03 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 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.

3.04 ELECTRICAL CONNECTIONS

- .1 Provide electrical work associated with this section under Section 26 05 00 - Common Work Results for Electrical.
- .2 Provide fire alarm system under Section 28 31 00 - Fire Detection and Alarm.

3.05 DISINFECTION

- .1 Disinfect new piping.
- .2 Fill piping systems with solution containing minimum of 50 parts per million of chlorine and allow solution to stand for minimum of 24 hours.

- .3 Flush solution from systems with clean water until maximum residual chlorine content is not greater than 0.2 part per million or residual chlorine content of domestic water supply.
- .4 Obtain at least two consecutive satisfactory bacteriological samples from piping, analyzed by certified laboratory, and submit results prior to piping being placed into service.

3.06 CONNECTIONS TO EXISTING WATER SUPPLY SYSTEMS

- .1 Notify Departmental Representative in writing at least 15 days prior to connection date.
- .2 Furnish materials required to make connections into existing water supply systems.

3.07 FIELD PAINTING

- .1 Clean, pretreat, prime, and paint new systems including valves, piping, conduit, hangers, supports, miscellaneous metalwork, and accessories as prescribed by section 09 91 99 - Painting.
- .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, apply one (1) coat primer to the surfaces: As described in section 09 91 99, item 3.4.1.1, followed by two (2) top coats such as section 09 91 99, item 3.4.1.2.
- .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 Finished Areas (Exposed piping)
 - .1 Provide primed surfaces with 2 coats of paint to match adjacent surfaces.
 - .2 Provide valves and operating accessories with 1 coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil.
 - .3 Provide piping with 50 mm wide red enamel bands self-adhering red plastic bands spaced at maximum of 6 m intervals throughout piping systems.
 - .2 Piping in Unfinished Areas (Not exposed piping)
 - .1 Provide primed surfaces with one coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil in attic spaces, spaces above suspended ceilings, crawl spaces, pipe chases, mechanical equipment room, and spaces where walls or ceiling are not painted or not constructed of a prefinished material.
 - .2 Provide self-adhering red plastic bands spaced at maximum of 6 m intervals.

3.08 FIELD QUALITY CONTROL

- .1 Site Test, Inspection:
 - .1 Perform, in the presence of the Departmental Representative, the required tests to verify compliance with the prescribed requirements.
 - .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 Piping above suspended ceilings: tested, inspected, and approved before installation of ceilings.
- .4 Test alarms and other devices.
- .5 Test water flow alarms by flowing water through inspector's test connection. When tests have been completed and corrections made, submit signed and dated certificate in accordance with NFPA 13.
- .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 Furnish appliances, equipment, instruments, connecting devices and personnel for tests.
 - .6 The Departmental Representative will be in attendance during the tests and will approve the system prior to their acceptance.

3.09 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Section 21 13 13 Wet Pipe Systems.

1.02 REFERENCES

- .1 National Fire Protection Association (NFPA)
 - .1 NFPA 13-2016, Standard for the Installation of Sprinkler Systems.
 - .2 NFPA 25-2014, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
- .2 Underwriter's Laboratories of Canada (ULC/cUL)

1.03 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 for equipment and systems, applicable series designation or style and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit samples of following:
 - .1 Each type of sprinkler head.
 - .2 Signs and valve tags.
- .4 Certificates:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Manufacturers' Instructions:
 - .1 Instructions: provide manufacturer's installation instructions.
- .6 Field Quality Control Submittals:
 - .1 Manufacturer's Field Reports: submit manufacturer's field reports specified.

1.04 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2 Provide Contractor's Material and Test Certificate for aboveground piping, as well as other deliverables for incorporation into manual specified in Section 01 78 00 - Closeout Submittals, in accordance with NFPA 13.

1.05 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in dry sprinkler systems.

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

1.06 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Provide spare sprinklers and tools in accordance with NFPA 13.

2 PRODUCTS

2.01 PIPE, FITTINGS AND VALVES

- .1 Pipe:
 - .1 Ferrous: to NFPA 13.
 - .2 Threading or grooving piping, Series 40, in accordance with ASTM A-135 and ASTM A-795, type E, grade A.
 - .3 Any pipe below the 40 Series shall be refused.
 - .4 Piping and fittings must be from a North American manufacturer. Any wall thickness diverging from North American standards is prohibited for this project.

Type of piping and schedule		
Building	Schedule 40 galvanized pipe	Schedule 40 black pipe
19 Hotel	Technical voids Technical Basement	Ground floor (paint) Upper floor (paint) Attic (paint)
29 Desinfection	Technical voids	Ground floor (paint) Upper floor (paint) north-east Attic (paint) south-west attic (paint) center- west attic (paint) north- west attic (paint)
32 Atelier	Technical voids	Ground floor (paint) Upper floor (paint) Attic (risers) (paint)
100 Lazaret	Below the building	Ground floor (paint)

- .2 Fittings and joints to NFPA 13:
 - .1 Ferrous: screwed or cut grooved.
 - .1 Grooved joints designed with two ductile iron housing segments, flush seal gasket for dry service, and zinc-electroplated steel bolts and nuts. Cast with offsetting angle-pattern bolt pads for rigidity and visual pad-to-pad offset contact.
 - .2 The type of joint will be of the “flush seal” type except between the black and galvanized steel which will be of the type “ready to install”.
 - .2 Ensure fittings, mechanical couplings, and rubber gaskets are supplied by same manufacturer from a North American manufacturer. Any wall thickness diverging from North American standards is prohibited for this project.

- .3 Auxiliary valves:
 - .1 ULC listed for fire protection service.
 - .2 Up to NPS 2: bronze, screwed ends, grooved, OS & Y gate.
 - .3 NPS 2 1/2 and over: cast or ductile iron, flanged or roll grooved ends, indicating butterfly valve.
 - .4 Swing or spring-actuated check valves.
 - .5 Ball drip.
 - .6 Tamper devices wired back to fire alarm panel.
- .4 Pipe hangers:
 - .1 Hangers and hardware must be galvanized steel. They must be ULC listed for fire protection services in accordance with NFPA.

2.02 SPRINKLER HEADS

- .1 General: to NFPA 13 and ULC listed for fire services.
- .2 See legend to plans for head characteristics

2.03 ESCUTCHEON PLATES

- .1 Provide split hinge type metal plates for piping passing through walls, floors, and ceilings in spaces with non visible piping.
- .2 Provide painted metal plates such as piping in places where piping is visible and painted.
- .3 Provide polished stainless steel plates where the piping is visible and unpainted.

2.04 SIGNS

- .1 Attach properly lettered Bilingual and approved metal signs to each valve and alarm device to NFPA 13.
- .2 Permanently fix hydraulic design data nameplates to riser of each system.

2.05 AUXILIARY 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 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.

2.06 FIRE DEPARTMENT CONNECTION

- .1 To NFPA 13 and ULC listed, Siamese type, location as indicated. Thread specifications to be compatible with local fire department.
- .2 Polished chrome plated recessed with identifying sign cast on plate. Threaded metal caps and chains.

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

2.07 DRY PIPE VALVE

- .1 ULC listed.
- .2 Cast or ductile iron, flanged or grooved end 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.
 - .8 Required air pressure 90 kPa (13 psi).
- .4 Provide valve complete with internal components that are replaceable without removing valve from installed position.

2.08 PRE-ACTION ALARM VALVE

- .1 ULC listed.
- .2 Cast or ductile iron, flanged or grooved end type, sized to suit water main.
- .3 Components:
 - .1 Air maintenance device with low pressure alarm.
 - .2 Alarm pressure switch with supervisory capability.
 - .3 Manometers
 - .4 Test valve and associated piping.
 - .5 Drain valve.
 - .6 Electrical tripping device.
 - .7 Shut off valve - OS & Y with tamper-proof device wired back to fire alarm panel.
- .4 Provide valve complete with internal components that are replaceable without removing valve from installed position.

2.09 PRESSURE GAUGES

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

2.10 INSPECTOR'S TEST CONNECTION

- .1 Locate inspector's test connection at hydraulically most remote part of each system, provide test connections approximately [3] m above floor for each sprinkler system or portion of each sprinkler system equipped with alarm device.
- .2 Provide test connection piping to location where discharge will be readily visible and where water may be discharged without property damage.

- .3 Provide discharge orifice of same size as corresponding sprinkler orifice.

2.11 RELIEF VALVE

- .1 ULC listed.

2.12 SPARE PARTS CABINET

- .1 For storage of maintenance materials, spare sprinkler heads and special tools.
- .2 Construct to sprinkler head manufacturers standard.

2.13 NITROGEN GENERATION SYSTEM

- .1 The Fire Sprinkler Contractor shall provide and install a South-Tek Systems Nitrogen Generation System to include the BlastOff™ - Air Bypass Tamper and Leak Detection Alarms.
- .2 Each Nitrogen Generation System provided shall be UL 508A - Industrial Control Panel Listed.
- .3 A single Nitrogen Generation System shall provide Supervisory Pressure between 0-60 PSI for up to total gallons of sprinkler pipe capacity within all Zones (Zone = sprinkler piping connected to a single Riser).
 - .1 Nitrogen Generation System sizing:
FPS-650 : 1 - 650 gallons (Building 14, building 19, building 48 and building 100)
FPS-1250 : 651 – 1,250 gallons (Buildings 29-32)
- .4 The Nitrogen Generation System shall have an integrated, oil-less air compressor located within the Nitrogen Generation System's cabinet.
- .5 The Nitrogen Generation System's cabinet shall be wall or skid mounted.
 - .1 Wall Mounted Models: FPS-650
 - .2 Skid Mounted Models: FPS-1250
- .6 The Nitrogen Generation System shall provide a minimum of 98% Nitrogen purity to the Fire Protection System.
- .7 The Nitrogen purity of the Nitrogen Generation System shall be monitored and verified via a hand held portable purity sensor.
- .8 The Nitrogen Generation System shall be powered by 120VAC requiring a 20 AMP dedicated circuit. For each Nitrogen Generation System the manufacturer shall provide a single 28 gallon (FPS-650) and 16.5 gallon (FPS-1250) Nitrogen Storage Tank. The Nitrogen Storage Tank shall be DOT or ASME rated for 150 PSI and shall be provided with ASME rated 100 PSI Safety Relief valve, on/off valve and ½" NPT I/O fitting.
- .9 The Nitrogen Generation System and Nitrogen Storage Tank shall be connected by the Sprinkler Contractor using ½" copper, galvanized steel pipe or approved flex hosing, rated at 175 PSI.

2.14 FEED AIR (COMPRESSOR)

- .1 The Nitrogen Generation System contains an integrated air compressor capable of providing clean, dry, oil free compressed feed air to the Nitrogen Generation System.

- .2 The Nitrogen Generation System shall be provided with an integral Air Bypass Tamper Alarm.
- .3 The Nitrogen Generation System's shall be provided with an air compressor package which is capable of achieving the 30 minute fill per NFPA 13 Requirements.
 - .1 The air compressor shall be provided with an aftercooler, automatic tank drain, coalescing filter (to remove residual oil)
 - .2 ½" copper, galvanized, black steel or approved flex hosing rated at 175 PSI shall be used when plumbing the Air Compressor.
 - .3 Electrical shall be provided for the air compressor per the manufacturer's specifications (i.e. wire size, voltage and proper breaker)
 - .4 STS-NF-C-2-J: 1 hp, 120/1/60 (Building 14, building 19, building 48 and building 100)
STS-NF-C-3-J: 2 hp, 120/1/60 (Buildings 29-32)

2.15 BMS ALARM INTEGRATION

- .1 The Nitrogen Generation System shall be designed with both an integrated Air Bypass Tamper Alarm and a Leak Detection System. Each alarm shall contain an isolated dry contact rated up to 240VAC 16 amps (NC & NO Contacts available). The Fire Sprinkler Contractor shall run a DC or AC signal line in ½" code approved electrical conduit from the Nitrogen Generation System to the supervisory circuit on the Building Monitoring System for each of the two alarms.
 - .1 The Air Bypass Tamper Alarm shall be designed to alarm should a technician inadvertently leave the Nitrogen generator offline (i.e. bypassed by compressed air) or accidentally turned off.
 - .2 The Leak Detection System shall send a signal to the Building Monitoring System should significant leaks develop within the Fire Protection System piping, prior to them becoming catastrophic and causing supervisory pressure to fall below specification. The Leak Detection System shall also be designed to send a signal to the Building Monitoring System if there is a failure with the Nitrogen Generation System or air compressor.

2.16 AUTOPURGE SYSTEM

- .1 A single or multiple AutoPurge System shall be installed per Zone, within the sprinkler pipe network, at an area where water/moisture will not typically collect. See plan views for AutoPurge locations.
- .2 The AutoPurge System shall not require any electrical connection, AC or DC.
- .3 The AutoPurge System shall have a connection allowing the portable nitrogen purity sensor to attach and sample the purity of Nitrogen within the Fire Protection System to ensure that proper Nitrogen purity levels have been attained.
- .4 The Fire Sprinkler Contractor shall adjust the needle valve (i.e. the black flow control located on the front of the device) on each AutoPurge System to purge the Fire Protection System per the manufacturer's specifications outlined within the sizing chart located on the back of the device.
- .5 The Fire Sprinkler Contractor shall confirm that the ball valve on each AutoPurge System is left in the "open" position during normal operation and shut off/taken out of service during hydro testing by turning the ball valve to the "closed" position.

2.17 SUPERVISORY GAS MONITORING – PURITY SENSORS

- .1 Furnish one Portable Hand Held Nitrogen Purity Sensor
- .2 The battery operated Portable Hand Held Nitrogen Purity Sensor is to be manually connected to the outlet of the AutoPurge System™ during periodic inspections in order to obtain a quick purity reading of the Nitrogen content within any particular Zone.

2.18 AIR MAINTENANCE DEVICE (SUPPLIED BY THE SPRINKLER CONTRACTOR)

- .1 The Air Maintenance Device shall be equipped with an adjustable pressure regulator (sized to meet Supervisory Pressure settings) for setting the maximum pressure on the Fire Protection System.
- .2 The Air Maintenance Device shall not contain a pressure switch.
- .3 The Air Maintenance Device shall be installed per the manufacturer's specifications.

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

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

3.02 INSTALLATION

- .1 Install, inspect and test to acceptance in accordance with NFPA 13 and NFPA 25.
- .2 Test in the presence of the representative of the Departmental Representative, the engineer and the appropriate authorities.
- .3 Install the piping so that the weld line is facing up.
- .4 Coat all grooved fittings and couplings gaskets with Vic-Lube lubricant
- .5 Install spare parts cabinet as indicated.
- .6 Pressure gauges:
 - .1 Location:
 - .1 On water side and nitrogen side of dry pipe valve.
 - .2 At air receiver.
 - .3 In each independent pipe from nitrogen supply to dry pipe valve.
 - .4 At exhausters and accelerators.
 - .2 Install pressure gauges with 3-way valve so that they can be easily removed if necessary.
 - .3 Locate so as not subjected to freezing.
- .7 Valve identification:
 - .1 Identify drain valve, by-pass valves and main shut-off valve and all auxiliary valves.
- .8 The AutoPurge System/s and all related accessories shall be installed by the Sprinkler Contractor.

- .9 Operating pressure range of the Dry or Preaction Fire Protection System shall be determined by the Fire Sprinkler Contractor. The Fire Sprinkler Contractor shall also set the system Air Maintenance Device accordingly for each Zone to the proper setting. Final settings shall be implemented with input from the manufacturer.

3.03 FIELD PAINTING

- .1 Clean, pretreat, prime, and paint new systems including valves, piping, conduit, hangers, supports, miscellaneous metalwork, and accessories as prescribed by section 09 91 99 - Painting.
- .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, apply one (1) coat primer to the surfaces: As described in section 09 91 99, item 3.4.1.1, followed by two (2) top coats such as section 09 91 99, item 3.4.1.2.
- .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 Finished Areas (Exposed piping)
 - .1 Provide primed surfaces with 2 coats of paint to match adjacent surfaces.
 - .2 Provide valves and operating accessories with 1 coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil.
 - .3 Provide piping with 50 mm wide red enamel bands self-adhering red plastic bands spaced at maximum of 6 m intervals throughout piping systems.
 - .2 Piping in Unfinished Areas (Not exposed piping)
 - .1 Provide primed surfaces with one coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil in attic spaces, spaces above suspended ceilings, crawl spaces, pipe chases, mechanical equipment room, and spaces where walls or ceiling are not painted or not constructed of a prefinished material.
 - .2 Provide self-adhering red plastic bands spaced at maximum of 6 m intervals.

3.04 FIELD QUALITY CONTROL

- .1 South-Tek Systems shall provide on-site guidance and training following the installation of the Nitrogen Generation Corrosion Inhibiting System in addition to checking nitrogen generation system, air compressor BMS alarm integration and autopurge. Contact South-Tek Systems; 2940 Orville Wright Way, Suite 600, Wilmington, NC, 28405 Phone: 910-332-4173 for further information.

3.05 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION