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PART 1 - GENERAL

1.1 REFERENCES

- .1 NFPA 13-2019, Standards for the Installation of Sprinkler Systems.

1.2 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop drawings: submit drawings showing layout complete with piping.
- .3 Shop drawings to show:
  - .1 Mounting arrangements.
  - .2 Operating and maintenance clearances.
- .4 Accompany shop drawings and product data with:
  - .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.
- .5 In addition to transmittal letter referred to in Section 01 33 00 - Submittal Procedures: use MCAC "Shop Drawing Submittal Title Sheet". Identify section and paragraph number.
- .6 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 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.

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1.2 SUBMITTALS  
(Cont'd)

.6 (Cont'd)

.4 (Cont'd)

.2 Equipment performance verification test results.

.3 Special performance data as specified.

.5 Approvals:

.1 Submit two (2) copies of draft Operation and Maintenance Manual to the Departmental Representative for approval. Submission of individual data will not be accepted unless directed by the Departmental Representative.

.2 Make changes as required and re-submit as directed by the Departmental Representative.

.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.

.7 Site records:

.1 Departmental Representative will provide one (1) set of reproducible mechanical drawings or AutoCAD Files. 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 for each service.

.4 Make available for reference purposes and inspection.

.5 Provide letter stating that sprinkler modifications were performed in accordance with NFPA 13.

.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 1/2" high as follows:

- "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).

.3 Submit to the Departmental Representative for approval and make corrections as directed.

.4 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

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1.3 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 - Health and Safety Requirements.

1.4 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 19 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 MATERIALS .1 All materials used on this project must be new and CSA approved unless noted otherwise.

PART 3 - EXECUTION

3.1 PAINTING, REPAIRS AND RESTORATION .1 Do painting in accordance with Section 09 91 23 - Painting.  
.2 Prime and touch up marred finished paintwork to match original.  
.3 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 Site Tests: conduct following tests in accordance with Section 01 45 00 - Quality Control and submit report.

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- 3.3 FIELD QUALITY CONTROL  
(Cont'd)
- .1 (Cont'd)
    - .1 Submit tests as specified in other sections of this specification.
  - .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.
    - .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.
- 3.4 DEMONSTRATION
- .1 Departmental Representative will use equipment and systems for test purposes prior to acceptance. Contractor to supply labour, material, and instruments required for testing.
  - .2 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.
  - .3 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.
  - .4 Instruction duration time requirements as specified in appropriate sections.
  - .5 Departmental Representative may record these demonstrations on video tape for future reference.
- 3.5 PROTECTION
- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

PART 1 - GENERAL

1.1 SUMMARY

- .1 Section Includes:
  - .1 Materials and installation for wet pipe fire protection and sprinkler systems for heated areas.
  - .2 The fire protection contractor shall be fully licenced and experienced in fire protection systems design and construction.

1.2 REFERENCES

- .1 American National Standards Institute/National Fire Prevention Association (ANSI/NFPA)
  - .1 ANSI/NFPA 13-2019, Installation of Sprinkler Systems.
  - .2 ANSI/NFPA 24-2019, Installation of Private Fire Service Mains and Their Appurtenances.
  - .3 ANSI/NFPA 25-2020, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Safety Data Sheets (SDS).
- .3 Underwriter's Laboratories of Canada (ULC)
  - .1 CAN/ULC S543-09, Standard for Internal Lug Quick Connect Couplings for Fire Hose.

1.3 SAMPLES

- .1 Submit samples of following if requested:
  - .1 Each type of sprinkler head.
  - .2 Signs.

1.4 DESIGN REQUIREMENTS

- .1 Design automatic wet pipe fire suppression sprinkler systems in accordance with required and advisory provisions of NFPA 13, by hydraulic calculations, or schedule method if applicable, for uniform distribution of water over design area. Occupancy hazard as required by NFPA 13.
- .2 Include with each system materials, accessories, and equipment inside and outside building to provide each system complete and ready for use.

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1.4 DESIGN  
REQUIREMENTS  
(Cont'd)

- .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 Locate sprinkler heads in consistent pattern with ceiling grid, lights, and air supply diffusers.
- .5 Devices and equipment for fire protection service: ULC approved for use in wet pipe sprinkler systems.
- .6 Location of Sprinkler Heads:
  - .1 Locate heads in relation to ceiling and spacing of sprinkler heads not to exceed that permitted by NFPA 13.
  - .2 Uniformly space sprinklers on branch.
- .7 Water Distribution:
  - .1 Make distribution uniform throughout the area in which sprinkler heads will open.
  - .2 Discharge from individual heads in hydraulically most remote area to be 100% of specified density required in NFPA 13.
- .8 Density of Application of Water:
  - .1 Size pipe to provide specified density when system is discharging specified total maximum required flow.
  - .2 Application to horizontal surfaces below sprinklers shall be lpm per m<sup>2</sup> as required for NFPA 13.
- .9 Sprinkler Discharge Area:
  - .1 Area: hydraulically most remote m<sup>2</sup> area as defined in NFPA 13.
- .10 Outside Hose Allowances:
  - .1 Include allowance in hydraulic calculations of lpm for outside hose streams per NFPA.
- .11 Friction Losses:
  - .1 Calculate losses in piping in accordance with Hazen-Williams formula with 'C' value of 120 for steel piping, 150 for copper tubing, and 140 for cement-lined ductile-iron piping.
- .12 Water Supply:
  - .1 Conduct flow and pressure test of water supply in vicinity of project to obtain criteria for basis of design in accordance with ANSI/NFPA 13.

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1.4 DESIGN  
REQUIREMENTS  
(Cont'd)

- .13 Show the following in the drawings submitted to the Departmental Representative for approval.
- .1 Show the layout and size of all piping and equipment in the area of renovation. Water velocity in the piping should not exceed 6 m/s (20 ft/s).
  - .2 Show location and size of service mains, interior feed mains, control valves, sprinkler risers, drain lines, sectional valves and inspector's test valves and switches on the drawings.
  - .3 Highlight or clearly indicate the area(s) to be protected by sprinklers on the drawings.
  - .4 Specify water flow requirements including the design density, design area, the hose stream demand (including location of the hose stream demand), the duration of supply, and sprinkler spacing and area of coverage in this section.
  - .5 Highlight all concealed spaces on the drawings that require sprinkler protection, such as spaces above suspended ceilings that are built of combustible material or that can contain combustible materials, such as storage, and communication cabling that is not fire-rated.
  - .6 Provide details on the drawings of pipe restraints for underground piping. This includes details of pipe clamps, tie rods, mechanical retainer glands, and thrust blocks.

1.5 SUBMITTALS

- .1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.
    - .1 Submit two (2) copies of Workplace Hazardous Materials Information System (WHMIS) Safety Data Sheets (SDS) in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate:
    - .1 Materials.
    - .2 Finishes.
    - .3 Method of anchorage
    - .4 Number of anchors.
    - .5 Supports.
    - .6 Reinforcement.

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- 1.5 SUBMITTALS .2 (Cont'd)  
(Cont'd) .2 (Cont'd)  
.7 Assembly details.  
.8 Accessories.
- .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 - Submittal Procedures.
- .1 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.  
.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.  
.3 Instructions: submit manufacturer's installation instructions.
- .2 Manufacturer's Field Reports: manufacturer's field reports specified.
- .4 Closeout Submittals:  
.1 Submit 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 Catalogue Data, including specific model, type, and size for:  
.1 Pipe and fittings.  
.2 Alarm valves.  
.3 Valves, including gate, check, and globe.  
.4 Water motor alarms.  
.5 Sprinkler heads.  
.6 Pipe hangers and supports.  
.7 Pressure or flow switch.  
.8 Fire department connections.  
.9 Excess pressure pump.  
.10 Mechanical couplings.
- .3 Drawings:  
.1 Sprinkler heads and piping system layout.  
.1 Prepare 30" by 42" detail working drawings of system layout in accordance with NFPA 13, "Working Drawings (Plans)".  
.2 Show data essential for proper installation of each system.  
.3 Show details, plan view, elevations, and sections of systems supply and piping.
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1.5 SUBMITTALS (Cont'd)	.4 (Cont'd)	
	.3 (Cont'd)	
	.4	Show piping schematic of systems supply, devices, valves, pipe, and fittings. Show point to point electrical wiring diagrams.
	.2	Electrical wiring diagrams.
	.4	Design Data:
	.1	Calculations of sprinkler system design.
	.2	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 maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
1.6 QUALITY ASSURANCE	.1	Qualifications:
	.1	Installer: certified journeyperson in wet sprinkler systems.
1.7 MAINTENANCE	.1	Extra Materials:
	.1	Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
1.8 DELIVERY, STORAGE, AND HANDLING	.1	Packing, shipping, handling and unloading:
	.1	Deliver, store and handle materials in accordance with manufacturer's written instructions.

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1.8 DELIVERY,  
STORAGE, AND  
HANDLING  
(Cont'd)

- .2 Storage and Protection:
  - .1 Store materials indoors in dry location.
  - .2 Store and protect materials from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

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 Perform welding in shop; field welding will not be permitted.
- .3 Conceal piping in areas with suspended ceiling.

2.2 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 Provide welded, threaded, grooved-end type fittings into which sprinkler heads, sprinkler head riser nipples, or drop nipples are threaded.
  - .4 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.
  - .5 Rubber gasketed grooved-end pipe and fittings with mechanical couplings are permitted in pipe sizes 1-1/8" and larger.
  - .6 Fittings: ULC approved for use in wet pipe sprinkler systems.
  - .7 Ensure fittings, mechanical couplings, and rubber gaskets are supplied by same manufacturer.
  - .8 Side outlet tees using rubber gasketed fittings are not permitted.
  - .9 Sprinkler pipe and fittings: metal.

2.2 PIPE, FITTINGS  
AND VALVES  
(Cont'd)

- .3 Valves:
  - .1 ULC listed for fire protection service.
  - .2 Gate valves: open by counterclockwise rotation.
  - .3 Provide rising stem OS & Y valve beneath each alarm valve in each riser when more than one alarm valve is supplied from same water supply pipe.
  - .4 Check valves: flanged clear opening swing-check type with flanged inspection and access cover plate for sizes 4" and larger.
  - .5 Provide gate valve in piping protecting elevator hoistways, machine rooms, and machinery spaces.
  - .6 Provide ball or butterfly valves for zone control.
- .4 Pipe hangers:
  - .1 ULC listed for fire protection services in accordance with NFPA.
- .5 Riser manifold assembly
  - .1 Provide floor control assembly in accordance with NFPA 13 consisting of supervised control valve, pressure gauge, flow switch, sight glass, test valve, drain valve and corrosion resistant orifice equal to smallest sprinkler orifice in the system.
  - .2 Provide as alternative to the above a riser manifold assembly with flow switch, pressure gauge with isolating valve, test/drain valve with orifice and sight glass.

2.3 SPRINKLER HEADS

- .1 General: to ANSI/NFPA 13 and ULC listed for fire services.
- .2 Sprinkler Head Type:
  - .1 Type A: upright bronze.
  - .2 Type B: pendant chrome glass bulb type.
  - .3 Type B: pendant chrome glass bulb type - Semi-recessed.
  - .4 Type C: recessed polished satin chrome glass bulb type with ring and cup.
  - .5 Type D: concealed glass bulb with cover to match ceiling finish.
  - .6 Type E: side wall polished satin chrome glass bulb type.
- .3 Provide nominal ½" orifice sprinkler heads.

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- 2.3 SPRINKLER HEADS .3 (Cont'd)
- (Cont'd)
- .1 Release element of each head to be of intermediate temperature rating or higher as suitable for specific application.
  - .2 Provide polished stainless steel ceiling plates or chromium-plated finish on copper alloy ceiling plates, and chromium-plated pendent sprinklers below suspended ceilings.
  - .3 Provide corrosion-resistant sprinkler heads and sprinkler head guards in accordance with NFPA 13.
  - .4 Provide sprinkler heads as required.
  - .5 Deflector: not more than 3" below suspended ceilings.
  - .6 Ceiling plates: not more than 1" deep.
  - .7 Ceiling cups: not permitted.
- 2.4 PRESSURE GAUGES .1 ULC listed and to Section 23 05 19 - Thermometers and Pressure Gauges - Piping Systems.
- .2 Maximum limit of not less than twice normal working pressure at point where installed.
- 2.5 PIPE SLEEVES .1 Provide pipe sleeves where piping passes through walls, floors, and roofs.
- .2 Secure sleeves in position and location during construction.
- .3 Provide sleeves of sufficient length to pass through entire thickness of walls, floors, and roofs.
- .4 Provide 1" 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, provide mechanically adjustable segmented elastomeric seal.
  - .3 In fire walls and fire floors, seal both ends of pipe sleeves or core-drilled holes with ULC listed fill, void, or cavity material.
- .5 Sleeves in masonry and concrete walls, floors, and roofs:
- .1 Provide hot-dip galvanized steel, ductile-iron, cast-iron sleeves.
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|-------------------------------------|----|---|
| <u>2.5 PIPE SLEEVES</u><br>(Cont'd) | .5 | (Cont'd)  |
|                                     | .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.   |
| <br>                                |    |   |
| <u>2.6 ESCUTCHEON PLATES</u>        | .1 | Provide one piece split hinge type metal plates for piping passing through walls, floors, and ceilings in exposed spaces.                       |
|                                     | .2 | Provide polished stainless steel plates chromium-plated finish on copper alloy plates in finished spaces.                                       |
|                                     | .3 | Provide paint finish on metal plates in unfinished spaces.  |

PART 3 Execution

- |  |    |  |
|--|----|--|
| <u>3.1 MANUFACTURER'S INSTRUCTIONS</u> | .1 | Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet. |
| <br>                                   |    |  |
| <u>3.2 INSTALLATION</u>                | .1 | Install, inspect and test to acceptance in accordance with ANSI/NFPA 13 and ANSI/NFPA 25.  |
| <br>                                   |    |  |
| <u>3.3 PIPE INSTALLATION</u>           | .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.   |
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3.3 PIPE  
INSTALLATION  
(Cont'd)

- .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 - Electrical General Requirements.
- .2 Provide control and fire alarm wiring, including connections to fire alarm systems, in accordance with Canadian Electrical Code.
- .3 Provide wiring in rigid metal conduit or intermediate metal conduit.

3.5 CONNECTIONS TO  
EXISTING WATER  
SUPPLY SYSTEMS

- .1 Notify the Departmental Representative and Halifax Water 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, pre-treat, 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.

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- 3.6 FIELD PAINTING  
(Cont'd)
- .3 Clean surfaces to remove dust, dirt, rust, and loose mill scale.
  - .4 Immediately after cleaning, provide metal surfaces with one (1) coat of pre-treatment primer applied to minimum dry film thickness of 0.3 mil, and one coat of zinc chromate primer applied to minimum dry film thickness of 1.0 mil.
  - .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:
      - .1 Provide primed surfaces with two (2) coats of paint to match adjacent surfaces.
      - .2 Provide valves and operating accessories with one (1) coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil.
      - .3 Provide piping with 2" wide red enamel bands or self-adhering red plastic bands spaced at maximum of 20 feet intervals throughout piping systems.
    - .2 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 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 piping with 2" wide red enamel bands or self-adhering red plastic bands spaced at maximum of 20 feet intervals.
- 3.7 FIELD QUALITY  
CONTROL
- .1 Site Test, Inspection:
    - .1 Perform test to determine compliance with specified requirements in presence of the Departmental Representative.
    - .2 Test, inspect, and approve piping before covering or concealing.
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- 3.7 FIELD QUALITY CONTROL  
(Cont'd)
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- .1 (Cont'd)
- .3 Preliminary Tests:
- .1 Hydrostatically test each system at 1400 kPa for a two (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 Authority of Jurisdiction, will witness formal tests and approve systems before they are accepted.
- .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.
- .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.
- .3 Site Tests:
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- 3.7 FIELD QUALITY CONTROL  
(Cont'd)
- .3 (Cont'd)
- .1 Field test each fire pump, driver and controllers in accordance with ANSI/NFPA 20. Testing to include:
- .1 Verification of proper installation, system initiation, adjustment and fine tuning.
- .2 Verification of the sequence of operations and alarm systems.
- .2 Have testing witnessed by the authority having jurisdiction.
- .3 Develop, with the Departmental Representative assistance, detailed instructions for O & M of this installation.
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- 3.8 CLEANING
- .1 Proceed in accordance with Section 01 74 00 - Cleaning.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.