

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.
- .2 National Fire Protection Association (NFPA)
 - .1 NFPA 13-2016, Standard for the Installation of Sprinkler Systems.
 - .2 NFPA 25-2011, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.
- .3 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN4 S543-M1984, Standard for Internal Lug Quick Connect Coupling for Fire Hose.

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 for equipment and systems, applicable series designation or style 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 Newfoundland and Labrador, Canada.
 - .4 Samples:
 - .1 Submit samples of following:
 - .1 Each type of sprinkler head.
 - .2 Signs and valve tags.
 - .5 Test reports:
 - .1 Submit certified test reports for packaged fire pumps from approved independent testing laboratories, indicating compliance
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1.2 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .5 Test reports: (Cont'd)
 - .1 (Cont'd)
with specifications for specified performance characteristics and physical properties.
 - .2 Test each pump/driver package at factory to provide detailed performance data and to demonstrate compliance with NFPA and specification. Submit certified test curves for approval of Departmental Representative.
 - .3 Test hydrostatically to meet requirements of fire protection system to which it will be connected.
- .6 Certificates:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .7 Manufacturers' Instructions:
 - .1 Instructions: provide manufacturer's installation instructions.
- .8 Field Quality Control Submittals:
 - .1 Manufacturer's Field Reports: submit manufacturer's field reports specified.
- .9 Sustainable Design Submittals:
 - .1 LEED Canada-NC-2009 Submittals: in accordance with Section 01 35 21 - LEED Requirements.

1.3 CLOSEOUT
SUBMITTALS

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

1.4 QUALITY
ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in dry sprinkler systems with documented experience and approved by manufacturer.
- .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.

1.5 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.

1.6 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements:
 - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .3 Packaging Waste Management: remove for reuse or return of pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 ENGINEERING
DESIGN CRITERIA

- .1 Design system in accordance with NFPA 13, using following parameters:
 - .1 Hazard:
 - .1 To suit light occupancy.
 - .2 Pipe size and layout:
 - .1 Hydraulic design calculations and sprinkler drawings must be stamped and signed by a Professional Engineer licensed to practice in Newfoundland and Labrador.
 - .2 Sprinkler head layout: to NFPA 13 or as directed by authority having jurisdiction.
 - .3 Water supply:
 - .1 Sprinkler contractor to conduct flow and pressure test of water in vicinity of project to obtain criteria for basis of design in accordance with NFPA 13.
 - .2 Hydraulic flow tests were conducted on May 18, 2017 on a hydrant in close proximity to the building site. The results indicate a static pressure of 413 kPa (60 psi). The results of the two flow tests are included in Appendix A - Flow Tests.
 - .3 Contractor to verify flow test results.
 - .4 Locate sprinkler heads in consistent pattern with ceiling grid, lights and air supply diffusers. Sprinkler heads to be centred in ceiling tiles wherever possible.
 - .4 Zoning:
 - .1 System zoning as indicated.

2.2 SUSTAINABLE
REQUIREMENTS

- .1 Materials and products in accordance with Section 01 35 21 - LEED Requirements.
- .2 Grooved couplings and fittings made from minimum 90% recycled metal.

- 2.3 PIPE, FITTINGS AND VALVES
- .1 Pipe:
 - .1 Ferrous: to NFPA 13.
 - .2 Fittings and joints to NFPA 13:
 - .1 Ferrous: screwed, or roll 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.
 - .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 ULC listed for fire protection services.
- 2.4 SPRINKLER HEADS
- .1 General: to NFPA 13 and ULC listed for fire services.
 - .2 Sprinkler head types:
 - .1 Type A: Upright bronze.
 - .2 Type C: Pendant chrome glass bulb type
 - .3 Type D: Recessed polished chrome glass bulb type with ring and cup.
- 2.5 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.
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| 2.5 AUXILIARY
SUPERVISORY
SWITCHES
(Cont'd) | .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. |
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| 2.6 FIRE
DEPARTMENT
CONNECTION | .1 | See Section 21 13 13 for more details. |
| | .2 | To NFPA 13 and ULC listed, Siamese type,
location as indicated. Thread specifications
to be compatible with local fire department. |
| | .3 | Polished bronze exposed with identifying sign
cast on plate. Threaded metal caps and chains. |
| | .4 | Install a 90-degree elbow with drain
connection at low-point near each fire
department connection to allow for system
drainage to prevent freezing. |
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| 2.7 PRE-ACTION
SYSTEM | .1 | Design drawings are based on a packaged
system which provides components as per the
sections which follow (Viking Total PAC3 or
approved equal). Components can also be
provided seperately but at no extra cost to
the project and with no impact on schedule. |
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| 2.8 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 Accelerator and anit-flooding device.
.2 Air maintenance device with low pressure
alarm.
.3 Alarm pressure switch with supervisory
capability.
.4 Test valve and associated piping.
.5 Drain valve.
.6 Electrical tripping device. |
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- 2.8 PRE-ACTION ALARM VALVE (Cont'd)
- .3 Components: (Cont'd)
 - .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.
- 2.9 COMPRESSED AIR SUPPLY
- .1 Automatic Air Compressor complete with air dryer.
 - .2 ULC listed.
 - .3 Capacity:
 - .1 To restore normal air pressure in system within 30 minutes.
 - .2 To provide air pressure of 140 kPa in excess of calculated trip pressure of dry pipe valve in accordance with instruction sheet furnished with dry pipe valve.
 - .4 Piping: ferrous, NPS 3/4 screwed joints and fittings, to NFPA 13.
- 2.10 PRESSURE GAUGES
- .1 ULC listed and to Section 23 05 19.01 - Thermometers and Pressure Gauges - Piping Systems.
 - .2 Maximum limit of not less than twice normal working pressure at point where installed.
- 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.

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 Testing to be witnessed by Fire Commissioner of Canada or authority having jurisdiction.
- .3 Install exterior fire alarm as indicated.
- .4 Install fire department connections as indicated.
- .5 Install spare parts cabinet as indicated.
- .6 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.
- .7 Valve identification:
 - .1 Identify drain valve, by-pass valves and main shut-off valve and all auxiliary valves.

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 - ACTION AND INFORMATIONAL SUBMITTALS.

- 3.3 FIELD QUALITY CONTROL
(Cont'd)
- .1 (Cont'd)
- .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.
- .2 Verification requirements in accordance with Section 01 35 21 - LEED Requirements, include:
- .1 Materials and resources.
- .2 Storage and collection of recyclables.
- .3 Construction waste management.
- .4 Resource reuse.
- .5 Recycled content.
- .6 Local/regional materials.
- .7 Low-emitting materials.
- 3.4 CLEANING
- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.