
ANNEX A

STATEMENT OF WORK

**CANADIAN METEOROLOGICAL CENTRE
ENVIRONMENT CANADA**

**2121 North Service Road
Trans-Canada Highway
Dorval, Quebec
H9P 1J3**

INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS

SPECIFICATIONS

Project: K4C20-158708

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**INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS
Project Specifications**

Project K4C20-158708

April 2014

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1. DRAWINGS

1. No drawings are attached to these specifications.

**2. TERMS AND
CONDITIONS**

1. The Contractor shall provide emergency service at all times to cover any possible power outages. The Contractor shall ensure that the necessary staffs are on site within three (3) hours. Only the Building Technical Authority or the Technical Authority's representative can authorize service calls and work orders.
2. The Contractor shall provide all necessary parts for the maintenance or repair work for which the Contractor is responsible.

**3. HOURLY-RATE WORK
(REPAIRS AND
SERVICE CALLS)**

1. All hourly-rate repairs and service calls shall be authorized in advance by the Departmental Representative or delegate.
2. For emergency calls only, a total of one (1) hour will be allowed for travel to and from the work site (half an hour each way).

**4. DEFECTS AND
ABNORMAL
CONDITIONS**

1. Defects or abnormal conditions in systems, devices or equipment discovered during an inspection shall be promptly reported to the Department, which will then be responsible for taking corrective action. If the services of a licensed electrician are needed to install wiring or conduit, for example, the Department may choose to hire the Contractor holding this contract or any other contractor to carry out the work. In either case, the Contractor shall

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advise the Department or the Departmental Representative in order to help correct the defect or anomaly.

2. The Contractor is responsible for maintenance, repair and adjustment of equipment or systems carried out by a subcontractor. However, the Contractor is not responsible for work done by another contractor selected by the Department unless the Contractor subsequently inspects the equipment or systems repaired or adjusted by the other contractor.
3. When the Contractor does repairs, the Contractor shall leave on site for inspection any defective parts that were replaced and make a notation to that effect in the report.

5. PARTS AND TOOLS

1. The Contractor shall repair worn parts or, where necessary, replace them with new parts.
2. The Contractor shall supply all instruments, tools and materials (or parts) required for the maintenance, repair and replacement of the parts covered by the contract.
3. Replacement parts shall be genuine and come from the equipment manufacturers. Where it is impossible to obtain genuine replacement parts or equipment, the Contractor shall use equivalents, the quality of which is equal to or greater than the quality of the original parts or equipment; the equivalents shall be approved by the Departmental Representative or a delegate.
4. The Department reserves the right to decide on the quality of replacement parts; this decision will be final and cannot be appealed.
5. Any parts installed without the Department's approval or deemed by the Department not to be in compliance shall be replaced within eight (8) days, failing which the Contractor will be deemed to be in default.
6. Any change of parts shall be authorized in advance by the Departmental Representative or a delegate.

6. LABOUR

1. Labour will be provided by the Contractor and shall be fully qualified.

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2. The Department reserves the right to reject and request the replacement of any individual it deems to be unacceptable.
3. The Contractor shall supervise its employees and ensure that their conduct and attire are appropriate and that their movement within the buildings is limited to the specific requirements of the work to be performed.
4. The Department shall make available to the Contractor an individual who will guide the Contractor as needed during the work period.

7. WORK PERIOD

1. The work period and schedule shall be established and coordinated with the timetable previously agreed to by the Contractor and the Technical Authority and/or the Authority's authorized representative.

8. POWERING OFF

1. None of the Department's equipment is to be powered off unless the Contractor is given official notice by the Departmental Representative or a delegate.

9. SITE SECURITY

1. The Contractor and the Contractor's representatives shall abide by building security regulations.
2. The Contractor shall provide the instructions, notices and signage necessary to inform the Building Manager and building occupants about any work in progress.
3. Equipment shall be delivered to the location stipulated by the Building Manager. The Contractor's representatives shall clear that space upon receiving the equipment unless otherwise authorized by the Departmental Representative or a delegate.
4. The Contractor or the Contractor's representatives shall sign in and out at the place designated by the Building Manager. They shall indicate the time in and time out and state the reasons for the visit.

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**10. DEPARTMENTAL
REQUIREMENTS**

1. The Contractor will be fully responsible for any omissions, breakage or incompetence and the consequences of the actions of its personnel.

**11. FAMILIARITY WITH
SITES AND SYSTEMS**

1. The Department will not consider any additional demands for special equipment due to a lack of information.

**12. PERSONAL
PROTECTION AND
PROTECTION OF
PROPERTY**

1. The Contractor shall take such safety measures and precautions as are needed to protect individuals and property against accidents or damage while maintenance and repairs are being carried out.
2. The Contractor shall be expressly and fully liable for accidents or damage to individuals or property resulting from its activities on the premises.
3. Special care shall be taken to avoid soiling, scratching, damaging or hitting finished surfaces with equipment parts, ladders, scaffolding or any other equipment that may be used in the course of the work.

13. FIRE PROTECTION

1. All work must be performed in accordance with the Fire Protection Engineering Standards of the Federal Fire Commissioner, Human Resources Development, Labour Directorate, Fire Safety Division.

These standards are available from the Labour Directorate, Fire Safety Engineering, Guy Favreau Complex, 200 René Lévesque Blvd. West, 4th floor, West Tower, Montreal, Quebec H2Z 1X4. Telephone: 514-982-2553

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2. Copies of these standards can be obtained by contacting Human Resources Development, Labour Directorate, Fire Safety Division, Ottawa K1A 0J2.

14. CLEAN PREMISES

1. Debris will not be allowed to accumulate. After each work period, the Contractor shall remove from the premises any waste and debris generated by its work. The Contractor shall leave the premises clean to the Departmental Representative's satisfaction.

15. DIRECTIONS

1. The Contractor shall comply with any instructions or directives it receives from the Departmental Representative or a delegate of ENVIRONMENT CANADA'S CANADIAN METEOROLOGICAL CENTRE, located at 2121 North Service Road, Trans-Canada Highway, Dorval, Montreal, Quebec, H9P 1J3. The Contractor shall submit, in electronic format to the Technical Authority, its reports and any other communications relevant to the execution of the contract.

16. COMMUNICATIONS

1. The list of telephone numbers where the Contractor or its supervisor or manager can be reached at any time of the day or night shall be placed on a list prepared and updated as needed by the Contractor and submitted to the Building Manager prior to the start of work.

**17. REPORTS,
CERTIFICATES AND
WORKSHEETS**

1. After every repair or service, the Contractor shall produce three (3) copies of a worksheet, along with detailed certificates of replacement parts. The worksheet shall identify the work performed, the parts replaced and/or repaired and the number of hours each employee spent on the job. The Contractor shall submit separate worksheets

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for maintenance work and repairs. Worksheets for emergency calls shall contain, in addition to the information indicated above, the date and exact time of the call, the name of the person who made the call, the Contractor's arrival time at the premises and the time the Contractor left.

2. The Building Technical Authority or authorized representative will keep a copy signed by the Contractor and will promptly send a copy to the client department. The third copy will remain the property of the Contractor.
3. Where there is no authorized representative on site, the Contractor shall forward to the manager two (2) copies of the worksheet duly signed by the mechanic on duty.

**18. MANUFACTURERS'
INSTRUCTIONS**

- 1 Maintaining servicing of systems, devices and equipment shall be performed by the Contractor in strict compliance with the instructions and directives of the manufacturers and suppliers concerned.

**19. ISOLATION AND
ELECTRICAL
TRANSFER
REQUEST**

1. The Contractor shall complete the "Request for Electrical Isolation" forms in the instances of electrical isolation or interruption described below, in accordance with Part II, Section VIII, of the *Canada Labour Code*.
 1. Main building power supply lines
 2. Power supply line panels and sub-panels
 3. Bus bars
 4. Motor control centres
 5. Back-up power circuits
 6. Fire alarm system and fire protection devices
 7. Mechanical protection devices (sump pump, etc.)
 8. Building services alarm circuit, including heating, ventilation and air conditioning

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9. Circuits powering more than one device
10. Circuits connected to a single device incorporated into a cooling or heating system
2. The Contractor shall complete the form and have it countersigned by the Technical Authority before carrying out the work.

21 ADDITIONS/CHANGES

1. The Department reserves the right to move, modify or add devices and connected equipment. The Contractor shall maintain such devices and equipment at no additional cost, provided the amount of equipment added does not exceed 3% of the existing amount.

SCOPE OF WORK

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1. GENERAL

1. The Contractor shall provide the labour, materials, tools and equipment needed to carry out the maintenance work described in this section on any equipment that is part of the systems described under the various modules, including any components, and the inspections described in the checklists and logs. The Contractor shall follow the description of work and omit irrelevant items.
2. The purpose of these specifications is to keep the equipment in very good working condition. However, these specifications shall be regarded as a minimum standard under which the Contractor shall work and in no way represent the full extent of the Contractor's responsibilities and obligations.
3. All work shall be performed in accordance with the manufacturer's instructions, the latest editions of the National Building Code of Canada and the National Fire Code of Canada (NFC) and any other applicable standards (NFPA, ULC, CSA, etc.).
4. The Contractor shall co-ordinate all specialized areas of work from the various modules so that the components are maintained at the same time in accordance with the frequencies and requirements set by standards and manufacturers.

2. REPORTS

1. At the end of the periodic inspections and tests for each module, the Contractor shall submit to the Departmental Representative a complete report in French (electronic version) of the audits, inspections and tests, including the list of equipment that certifies the equipment is working properly (this report must be submitted before the end of the month in which the inspection is performed).
2. The form and the information to be included in each report shall, where required, be based on the models prescribed for information by each of the standards governing the module in question and shall be submitted before the contract is carried out, for approval by the Technical Authority. The Technical Authority reserves the right to amend these reports or to require additional reports.
3. Each report shall be verified and countersigned by the Building Technical Authority or another designated by the Building Technical Authority.

FIRE ALARM SYSTEM (FAS) MODULE

**FIRE ALARM SYSTEM MODULE
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1. GENERAL

1. System maintenance work shall be performed every year of the contract at a rate of eleven (11) monthly visits and one annual overall visit.
2. All tests and inspections of the fire alarm system shall conform to the latest editions of the National Fire Code of Canada (NFC) and standard CSA/ULC-S536.
3. The content and form of inspection and test sheets shall be similar to those prescribed in standard CSA/ULC-S536.
4. The Contractor shall visually monitor the fire alarm system at all times while tests are being conducted. If a real fire is detected and indicated on the panel, the Contractor shall notify building security officials and/or call the fire department.
5. The Contractor shall not sound the bells when the building is occupied, i.e. between the hours of 7 am and 6 pm. Maintenance work, tests or inspections that could accidentally set off the bells while the building is occupied are prohibited unless authorized in writing by the Technical Authority.
6. The checklists below were established in part based on the requirements for inspections and testing set out in standard CSA/ULC-S536-04 from the Underwriters' Laboratories of Canada. In the event of a discrepancy between the lists below and the standard, the requirements set out in the standard shall prevail.
7. No drawings are attached to these specifications.
8. Any anomalies shall be reviewed with the Technical Authority in charge of the system and noted, and possible changes shall be discussed.
9. Check and, if necessary, correct the equipment list (inventory) with model and serial numbers.
10. Check the labelling on the identified equipment; if no labelling is found, label the inventory parts of the alarm system.
11. Report any unrectified anomalies.
12. After each inspection, ensure that the systems are turned back on and that the building zones are properly protected.

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2. PLANNING

1. Whenever maintenance is to be performed, the Contractor shall notify the Building Technical Authority, in the prescribed manner, that the fire protection system has to be inspected, tested, checked, repaired or otherwise worked on.

3. INSPECTION LOG

1. The Contractor shall establish a log of all testing of the fire alarm system that includes the inspection and test sheets required by standard CSA/ULC-S536 and shall ensure that the sheets are retained for consultation by the competent authority for the required time between any two inspections, maintenance jobs or tests but not less than two years.
2. The date on which the inspection was conducted and the initials of the person conducting the inspection shall be recorded in the log monthly.

4. DAILY INSPECTIONS

1. Check the status of the main fault detector and the remote fault detectors.
2. Check the status of the main power on indicator or any equivalent indicator.
3. **The Contractor is not required to conduct daily inspections under this contract. These inspections will be performed by others.**

5. MONTHLY INSPECTIONS

The Contractor shall submit its proposed inspection rotation program plan in writing to the Technical Authority for approval. With the fire alarm system connected to the emergency power supply, the Contractor shall inspect and test and check the following functions to ensure that the system is in working order.

1. Activate in rotation a trigger or manual signal in order to check:
 1. Operation confirmed by a warning signal and alarm in at least one zone or according to the requirements of the building fire safety plan, and

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2. The main annunciator to ensure that the devices tested were properly annunciated.
2. Check the operation of the common audible and visual fault signals.
3. Inspect the power supply batteries:
 1. Clean and lubricate the terminals.
 2. Ensure that the terminal clips are properly attached.
 3. Check the level and density of battery fluid based on the manufacturer's specifications.
4. If required, test the emergency telephone to ensure two-way communication and the appropriate signal at the monitoring station or responder.
5. If required, check the phone search function for people in a given zone.

6. ANNUAL INSPECTIONS

With the fire alarm system connected to the emergency power supply, the Contractor shall inspect, test and check the following functions to ensure that the system is in working order. In the event of a discrepancy between the list below and the standard, the requirements set out in the standard shall prevail.

1. During the annual test, all manual fire alarms shall be inspected. A rotation program should not be introduced (see article 5.7.2 of standard CAN/ULC-S536-04).
2. Check the zone annunciator to ensure that the test devices provide the appropriate indications.
3. Check the operation of the common audible and visual fault signals.
4. **Control panel**
 1. Visually and physically inspect the wiring, connections, plug-in components, light bulbs and other parts to ensure that their mechanical and electrical assembly and connection are operational.

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2. Clean all panel components with a dry cloth.
3. Check the emergency batteries to ensure that:
 1. the terminals are clean and lubricated;
 2. the tightening lugs are properly adjusted.
4. Check the operation and brightness of the light bulbs and replace any defective bulbs.
5. Check each zone to make sure it is identified by a clear, legible label.
6. Activate the various controls to ensure that they work properly.
7. Simulate on the panel a ground, a short circuit and an open circuit in each detection and alarm zone to ensure that the internal and external circuits are being properly monitored.
8. Ensure that the power supply circuits are appropriate and clearly identified and that they meet the system requirements; ensure that they have proper fuses or breakers and that they are not vulnerable to accidental disconnection or any other form of interruption.
9. Check the batteries and test the bells annually:
 1. Ensure that the batteries are not damaged and that the recharging system is operating normally and protects the batteries from overcharging. Testing the batteries shall entail running the system with the emergency batteries for a minimum of 24 hours in monitor mode and then conducting a test to show that the batteries are providing the full amount of current required.
 2. Once this test is complete and before switching back to normal power, the Contractor shall record in a typed report the voltage at the battery terminals and the audibility and intelligibility of the signals and phone messages.

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If the bell module has to be turned off to conduct any inspections, the Contractor shall follow the directives set out in clause 1.4 of this module.

- 10 Check the transmission of alarm signals to the fire department or designated monitoring station (if applicable).
- 11 Ensure that the equipment is properly grounded and that ground leakage detection is in place.
- 12 Check the vital function and loss of main power indicator circuits.
- 13 Check the anti-tampering function if it is used and its identification relative to the established system.
14. Check all in/out tests and their identification relative to the established system.
15. Draw up a complete list of equipment used and the model and serial numbers of all equipment used on the premises.
16. Ensure that the operating voltage of the equipment is correct and that the fuses used are of the correct rating.
17. Check the supply voltage of the equipment.
18. Submit a complete, typed report on voltage levels and current.
- 19 Check the battery overcharge protection circuit.
20. Ensure that the batteries used are gel or acid batteries with the same voltage and capacity.
21. Submit a typed report on any anomalies found.

5. Annunciator panel

1. Check the operation and brightness of the light bulbs. Replace any defective bulbs.
2. Check each zone to make sure it is identified by a clear, legible and current label.

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3. Activate the various controls to ensure that they work properly.
4. Activate each trip circuit and ensure that the indicator lights up and identifies the corresponding zone.
5. Test the emergency power supply to ensure that the equipment is working properly.
6. Ensure that a manual station lights the indicator and identifies the corresponding zone.
7. Check the operation of the common audible and visual fault signals.
8. Check the emergency batteries to ensure that:
 1. the terminals are clean and lubricated;
 2. the terminal clamps are secure.

6. **Manual stations**

1. During the annual test, all manual fire alarms shall be inspected. A rotation program should not be introduced (see article 5.7.2 of CAN/ULC-S536-04 standard).
2. A manual fire alarm that comprises glass to be broken or a similar replaceable part shall be tested with the glass or part in place.
3. Remove any dust from the outside and inside of the boxes.

7. **Heat detectors**

1. All detectors shall be inspected and tested to ensure that they work properly according to the manufacturer's standards.
2. The Contractor shall identify in the report any sensors that are painted over or damaged and state whether they need to be replaced.

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3. Check and test all restorable heat detectors by applying a heat source with no open flame in order to trip the detector.
4. Check and test all non-restorable heat detectors by checking the continuity of the sensor trip circuit. This is done by bypassing a resistance equal to the resistance of the sensor when it is in operation.

8. Smoke detectors

1. Clean the base, locking ring, indicator light and grille with a dry cloth.
2. Take apart the detector and clean the sensor and the radioactive component using the method recommended by the manufacturer (water is not acceptable).
3. Do a sensitivity test and adjust the ionization source for maximum effectiveness in the area where the detector is installed. Enter the value in the record.
4. Check and replace the warning light on the base.
5. The operation of each smoke detector must be checked by introducing smoke or simulated smoke into the detection chamber according to the manufacturer's instructions (see s. 5.7.4.1.2 of standard CAN/ULC-S536-04).

9. Duct smoke detectors

1. Clean the base, locking ring, indicator light and grille with a dry cloth.
2. Clean all smoke sampling tubes.
3. Take apart the detector and clean the sensor and the radioactive component using the method recommended by the manufacturer (water is not acceptable).
4. Do a sensitivity test and adjust the ionization source for maximum effectiveness in the area where the detector is installed. Enter the value in the record.

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4. Check and replace the warning light on the base.

6. Each smoke detector installed in a duct must be inspected and tested to confirm that it is in working condition (see s. 5.7.4.4.1 of standard CAN/ULC-S536-04).

10. **Other types of automatic sensors**

1. Check and calibrate if necessary according to the manufacturer's recommendations.
Test the sensors in accordance with standard CAN/ULC-S536.

11. **Alarm signals**

Audible signals

1. Check the operation of all horns and bells by sounding the advance warning first and then the general alarm.
2. Ensure that the installation and assembly do not hinder performance.

Visual signals

1. Check the operation of all visual signals and replace the bulbs if necessary. Ensure that there is nothing obstructing the signal.

12. **Auxiliary equipment**

1. Trigger an alarm by simulating a mechanical operation at the connection point of a piece of auxiliary equipment, such as a flow switch, a valve monitored by the circulation current of the fire protection systems or any other signal from any other auxiliary equipment.

13. **Auxiliary functions**

1. Check all auxiliary system functions, such as ventilation system shutoff, automatic closing of fire or smoke doors or shutters, operation of smoke control systems, pressurization of stairwells or elevator recall.

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2. Ensure that the normal operation of the fire alarm system is not hindered by a fault in an auxiliary function.

14. **Electric locks**

1. Activate the auxiliary control relay to open doors with electric (security) locks to ensure that all doors can be unlocked.
2. Check each door that has an electric lock to make sure it is unlocked.
3. Check each door that has an electric lock to make sure it is unlocked while the fire alarm bells are being sounded and after they are turned off.
4. During these tests, open the door from the outside of the electric lock so as not to be detected by a mechanical opener or motion sensor. The Contractor shall check to make sure the electric lock is still deactivated after the bells stop.
5. Make sure the electric lock on each door is turned on again.
6. The Contractor shall inform the Building Technical Authority in writing of any anomaly that does not conform to the provisions of the National Building Code.

7. **EQUIPEMENT LIST**

1: COMPUTER ROOM: (N S I)

QUANTITY	DESCRIPTION
1	MXL control panel
7	DI-3 ionization detectors (smoke detectors)
17	High velocity smoke detectors
4	MH-51 manual stations
4	FM-200 manual stations
6	Horns
5	Blue strobe lights
8	Strobe lights
4	Abort buttons

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39	Interfaces
15	Sprinkler pressure switches
1	Sprinkler flow switch

2: CONTROL ROOM and GENERATOR ROOM:

QUANTITY	DESCRIPTION
1	MXL-IQ panel
3	Cerberus Pyrotronics MH-517C manual stations
2	FM-200 manual stations
7	Fenwal 140 F rate-of-rise heat detectors
21	DI-3 smoke detection products
4	FM-200 solenoid valve
2	Cerberus Pyrotronics S122 IR flame detectors
13	Remote addressable interfaces
4	Horns
4	Strobe lights
5	Blue strobe lights

3: BUILDING:

1	MXL panel
1	Network command centre (Siemens models NCCXP-G, NCCXP-GL and NCCXP-WAN with NCCXP software)
25+1 ext.	Cerberus Pyrotronics MSI-51 manual stations
61+2 ext.	Horns
45	Restorable heat detectors
301	Smoke detectors
2	Duct smoke detectors
30	Remote addressable interfaces
2	Cerberus Pyrotronics AD-3XR1 duct detectors
26+2 ext.	Strobes

PORTABLE FIRE EXTINGUISHER (PFE) MODULE

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1. GENERAL

1. All tests and inspections of portable fire extinguishers shall be compliant with the latest editions of the National Fire Code of Canada (NFC) and standard NFPA 2001.
2. All tests and inspections of the range hood system shall conform to standard ULC-1254.6.

2. PLANNING

1. Whenever maintenance is to be performed, the Contractor shall notify the Building Technical Authority, in the prescribed manner, that the fire protection systems have to be inspected, tested, checked, repaired or otherwise worked on (see NFC 6.1.1.3.1).

3. INSPECTION LOG

1. The Contractor shall keep a log of all tests carried out on the extinguishers and have it available for consultation by the competent authority.
These logs must be available for consultation for the required time between any two inspections, maintenance jobs or tests but not less than two years (see NFPA-10)
2. The date on which the inspection was conducted and the initials of the person conducting the inspection shall be recorded in the log monthly.
3. The data shall be recorded at all times on a label attached to each of the portable fire extinguishers, as well as in a log kept in a binder or a computer application designed to keep record of permanent information.

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INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

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4. MONTHLY INSPECTIONS

1. Portable fire extinguishers shall be inspected immediately when put into service and approximately every 30 days after that.
2. Periodic inspections of portable fire extinguishers shall include at least the following checks:
 1. Check that extinguishers are located in the designated areas.
 2. Make sure there is nothing obstructing access to or visibility of the portable fire extinguishers.
 3. Ensure that operating instructions on nameplates are visible and that they face outward.
 4. Make sure that anti-tampering seals and indicators are not broken or missing.
 5. Weigh the portable fire extinguishers to verify that they are full.
 6. Examine fire extinguishers for physical damage, corrosion or leakage and ensure that the hoses are not blocked.
 7. Check that pressure sensors and gauges are in the proper operating position or range.
 8. For mobile units, check the condition of wheels, tires, cart, hoses and nozzles.
 9. Check that the SIMDUT or WHMIS labels are in place.

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3. When the inspection of any portable fire extinguisher reveals a deficiency in the conditions listed in section 3.2 above, immediate corrective action must be taken.

5. ANNUAL MAINTENANCE

1. Portable fire extinguishers shall be serviced at least once a year, during hydrostatic testing or as required following an inspection.
2. Periodic inspections of portable fire extinguishers shall include at least the following checks:
 - (1) Visually examine the extinguisher for damage by removing the extinguisher from the hanger, bracket, or cabinet, and visually examine the extinguisher for damage, including pressure gauge, cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers.
 - (2) Verify that the hanger, bracket, or cabinet is the proper one for the extinguisher.
 - (3) Verify that the hanger, bracket, or cabinet is secure, undamaged, and properly mounted.
 - (4) Verify that the nameplate operating instructions are legible and facing outward.
 - (5) Confirm that the extinguisher model is not subject to recall and is not obsolete.
 - (6) Verify the extinguisher records to determine internal examination and hydrostatic test intervals. Thoroughly examine the cylinder for dents, damage, repairs, or corrosion.
 - (7) Verify the pull pin functions properly and examine for damage or corrosion by removing the pull pin.
 - (8) Verify that the handle and levers are undamaged and operable.
 - (9) Verify that the valve stem is correctly extended and not corroded or damaged.

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- (10) Verify that the pressure gauge or indicator is in the operable range.
 - (11) Verify that the gauge operating pressure corresponds with the nameplate instructions.
 - (12) Verify that the gauge face corresponds with the proper agent type.
 - (13) Verify that the gauge threads are compatible with the valve body material.
 - (14) Verify that the nozzle or hose assembly, or both, is unobstructed, by removing and examining the nozzle.
 - (15) Confirm that the nozzle and hose assembly are correct for the model of extinguisher.
 - (16) Verify that the hose and couplings are not cut, cracked, damaged, or deformed.
 - (17) Examine internal valve port surfaces and threads for signs of leakage or corrosion by removing the nozzle or hose assembly and reinstalling the nozzle and hose assembly securely after examination.
 - (18) Verify that the hose retention band is secure and properly adjusted.
 - (19) Weigh the extinguisher and verify that it corresponds to the weight listed on the nameplate.
 - (20) Reinstall the ring pin and install a new tamper seal.
 - (21) Clean exposed extinguisher surfaces to remove any foreign material.
 - (22) Record the maintenance on the extinguisher tag or label.
3. A portable fire extinguisher taken out of service for maintenance must be replaced by a similar extinguisher with the same capacity and designed for the same application.

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4. During the maintenance of portable fire extinguishers, seals must be removed by activating the safety pin. Once the maintenance work is done, a new seal must be affixed.

5. SIX-YEAR INSPECTIONS

1. Every six years, portable fire extinguishers that require a 12-year hydrostatic test shall be emptied and serviced. A recovery system must be used for Halon extinguishers.
2. All extinguishers must have a tag indicating the month and year that the six-year maintenance was performed, as well as the name of the person who performed the work.

These tags must be made of metal or another material of equal durability and must be 5.1 cm X 8.9 cm in size. The old label must be removed and the new one affixed to the outside surface of the extinguisher by a method that does not require heat.

The following information must be included on the label:

- a) the month and year that the six-year maintenance was performed, and
 - b) the name of the company responsible for the maintenance and the name or initials of the person who performed the work.
3. All portable fire extinguishers that have undergone internal testing or that have been recharged shall be equipped with an "verification of service" collar around the neck of the extinguisher. This circular collar must be designed as a single continuous piece of material that cannot be removed unless the extinguisher valve is completely removed.
 4. The Contractor shall provide a unit price including parts and labour for the six-year inspections.
 5. During six-year maintenance work, the Contractor shall take inventory of the fire extinguishers that have to be

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emptied and notify the Building Technical Authority in order to obtain approval before performing the work.

6. HYDROSTATIC TESTS

1. Hydrostatic tests shall be conducted at least once every 12 years on dry chemical and Halon extinguishers (see Table 8.3.1 of standard NFPA 10, 2010 edition).
2. The Contractor shall provide a unit price including parts and labour for hydrostatic testing.
3. During 12-year maintenance work, the Contractor shall take inventory of the fire extinguishers that have to be emptied and notify the Building Technical Authority in order to obtain approval before performing the work.
4. Hydrostatic testing of **CO₂** extinguishers must be conducted every five years (see Table 8.3.1 of standard NFPA, 2010 edition).

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7. EQUIPMENT LIST

QUANTITY	DESCRIPTION OF PORTABLE FIRE EXTINGUISHERS
20	ABC Dry Chemical, 5 lbs
48	ABC Dry Chemical, 10 lbs
6	ABC Dry Chemical, 20 lbs
4	CO ₂ , 5 lbs
12	CO ₂ , 10 lbs
6	CO ₂ , 15 lbs
4	CO ₂ , 20 lbs
10	Water Mist
1	Class K system (restaurant)
1	Range hood system (restaurant)

STANDPIPE AND FIRE HOSE SYSTEM (FH) MODULE

**STANDPIPE AND FIRE HOSE SYSTEM MODULE
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1. GENERAL

1. All tests and inspections of the standpipe and hose systems shall conform to the latest editions of the National Fire Code of Canada (NFC) and NFPA-10, 14, 25 and 1962.
2. The Contractor shall visually monitor the fire alarm system at all times while tests are being conducted. If a real fire is detected and indicated on the panel, the Contractor shall notify building security officials and/or call the fire department.
3. The Contractor shall not sound the bells when the building is occupied. Maintenance work, tests or inspections that could accidentally set off the bells while the building is occupied are prohibited unless authorized in writing by the Technical Authority.

2. PLANNING

1. Whenever maintenance is to be performed, the Contractor shall notify the Building Technical Authority, in the prescribed manner, that the fire protection systems have to be inspected, tested, checked, repaired or otherwise worked on (see NFC 6.1.1.3.1).

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3. INSPECTION LOG

1. The Contractor shall establish a log of all tests carried out on fire hose systems and retain the log for consultation by the competent authority. These logs shall be retained for at least five years in order to identify when the five-year flow test required by NFPA 25, 2011 Edition (see section 6.3.1.1) should be performed.
2. The date on which the inspection was conducted and the initials of the person performing the inspection shall be recorded in the log monthly.

4. WEEKLY INSPECTIONS

1. Inspect the sealed control valves.
2. Check the hose cabinets and standpipes to ensure that they are clearly identified and unobstructed.
3. **The Contractor is not required to conduct weekly inspections under this contract. These inspections will be performed by others.**

5. MONTHLY INSPECTIONS

1. Inspect locked-out control valves.
2. Inspect control valves with an anti-tampering switch.
3. Check the hose cabinets and standpipes to ensure that they are clearly identified and unobstructed.
4. Check to make sure the hose is in the right place and the equipment is in place and in good working order.

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**6. THREE-MONTH
INSPECTIONS**

1. Inspect piping.
2. Inspect hose connections.
3. Test alarm devices.

7. ANNUAL INSPECTIONS

1. Test the main drain.
2. Check the water supply control valves. The valves shall be kept open.
3. Check the pressure in the main control valves and the upper parts of the standpipes to make sure it is adequate (residual pressure of at least 65 psi at the highest point) .
4. Check the operation of alarm devices such as the flow sensors and valve position switches. Make sure that the signals will be sent to the fire alarm panel and that the pump will start (if necessary).
5. Check the condition of the hoses. The hoses shall be removed from the rack and re-installed with the folds in different positions so as to prevent damage.
6. Check the fire department connections to ensure that the connection valves are working, are not obstructed and are protected by an appropriate threaded plug.
7. Check to ensure that an inspection card is properly attached to the main valve and contains the pressure readings referred to in clause 2 and the results of the inspection of the valves and fire department connections. The name, address and telephone number of the Contractor, the date of the inspection and the initials of the technician who did the work shall also appear on the card.

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8. THREE-YEAR FIRE HOSE INSPECTIONS

1. Every three (3) years, the Contractor shall conduct a hydrostatic test of the fire hoses as specified in Table 6.1.1.2 of standard NFPA 25, 2011 edition.

9. FIVE-YEAR INSPECTIONS

1. Every five (5) years, the Contractor shall test the flow through the fire hose system to ensure that the design flow can be delivered. The Contractor shall submit a typed report containing the test results. The five-year inspection shall be included in Year 1 of the contract.
2. Notwithstanding what may be stated elsewhere in these specifications, if, during a water flow test, the water contains dirt, the Contractor shall flush the entire system until it is free of all foreign matter.

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10. EQUIPMENT LIST

#	QUANTITY	DESCRIPTION OF FIRE HOSE CABINETS
1.	1	Network
2.	1	Flow switch
3.	11	Fire hose 1½ x 75, NPS Thermoplastic all fog nozzles

SPRINKLER SYSTEM (SS) MODULE

SPRINKLER SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS

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1. GENERAL

1. All tests and inspections of wet sprinkler systems shall conform to the latest editions of the National Fire Code of Canada (NFC) and the NFPA-13 and 25.
2. The Contractor shall visually monitor the fire alarm system at all times while tests are being conducted. If a real fire is detected and indicated on the panel, the Contractor shall notify building security officials and/or call the fire department.
3. The Contractor shall not sound the bells when the building is occupied. Maintenance work, tests or inspections that could accidentally set off the bells while the building is occupied are prohibited unless authorized in writing by the Technical Authority.

2. PLANNING

1. Whenever maintenance is to be performed, the Contractor shall notify the Building Technical Authority, in the prescribed manner, that the fire protection systems have to be inspected, tested, checked, repaired or otherwise worked on (see NFC 6.1.1.3.1).

3. INSPECTION LOG

1. The Contractor shall establish a log of all testing of the water sprinkler system and retain the log for consultation by the competent authority.
These logs shall be retained for at least five years in order to identify when the five-year inspections of the pressure gauges as required by NFPA 25, 2011 Edition (see section 5.3.2.1) should be performed.
2. The date on which the inspection was conducted and the initials of the person performing the inspection shall be recorded in the log monthly.

SPRINKLER SYSTEM MODULE
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4. WEEKLY INSPECTIONS

1. Valves that have no locks and/or are not electrically monitored shall be inspected at intervals not exceeding seven (7) days.
2. Valves that are locked in the open position shall be inspected at intervals of not more than one (1) month.
3. **The Contractor is not required to conduct weekly inspections under this contract. These inspections will be performed by others.**

5. MONTHLY INSPECTIONS

1. Valves that are locked in the open position shall be inspected at intervals not exceeding one (1) month.
2. Except where there is a risk of the test faucet freezing, tests shall be conducted at intervals of not more than one (1) month on the flow sensors in the sprinkler systems using the test faucet beside the sprinkler valve.

6. TWO-MONTH INSPECTIONS

1. Transmitters and devices activated by water flow shall be tested at intervals of not more than two (2) months.

7. SIX-MONTH INSPECTIONS

1. Switches with pilot lights on gate valves, water tank gauges, water tank and building temperature sensors and other sprinkler system monitoring devices shall be tested at intervals of not more than six (6) months.

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8. ANNUAL INSPECTIONS

1. Check the system water supply valves (including valves outside the building, such as PIVs) to ensure that they are fully open.
2. Check to ensure that the automatic water extinguisher control valves are open, accessible at all times and in proper working condition.

After manipulating a control valve, the Contractor shall conduct a drain faucet flow test to ensure that the control valve is in the fully open position.
3. Check the troughs housing the automatic sprinkler control valves to make sure they do not contain any water and are protected from freezing.

In unheated spaces, the Contractor shall make sure that the temperature is always above 4°C.
4. Inspect the differential valve and its components. Inspect the seals, the alarms, the flow indicator, the reaction time, the supply, the drain faucet, the check valve, the water level, the air supply, the pressure gauge, etc. Inspect the warning signals on the central panel.
5. Check the air pressure and the water pressure to ensure that the required pressure is maintained in the system.
6. Check the automatic extinguisher alarms (electrical warning bells) using the system's test hose.
7. Check the control valve position switches to make sure they are working properly.
8. Check the alarm signals and any other signals from the building fire alarm system to ensure that they are transmitted properly.
9. Conduct a drain test using the 50 mm main drain hose to ensure that the main control valve and the water intake system are able to deliver the required rate of flow.

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10. Activate the differential valves using the system's test pipes to ensure that they and the quick-opening devices are working properly.
11. If necessary, make sure the booster pump (water system) or the air compressor and automatic air pressure retention device (air system) are working properly.
12. For systems that use antifreeze, the Contractor shall check to make sure that the solution is sufficiently dense not to freeze if the temperature drops at least 8°C below the minimum outdoor air temperature. Check the solutions and replace them if they are diluted. Record the action in the typed report.
13. Check the condition and operation of all components of the automatic extinguisher system, whether or not they are specifically described, and report any deficiencies or instances of non-compliance with the installation and inspection standards.
14. Check the fire department connections to ensure that the connection valves are working, are not obstructed and are protected by an appropriate threaded plug.

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9. EQUIPMENT LIST

QUANTITY	DESCRIPTION OF SPRINKLER SYSTEM
1	Post indicator valve (PIV)
1	Main manual valve (tamper switch)
1	Main flow valve and sensor
1	Low-pressure control
8	Field shut-off valves
8	Field flow sensors
930	Wet sprinkler heads
8	Dry sprinkler heads

PREACTION AND/OR DELUGE SYSTEM MODULE (FF)

**PREACTION AND/OR DELUGE SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

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1. GENERAL

1. All tests and inspections of preaction and/or deluge systems shall be compliant with the National Fire Code of Canada (NFC), the latest editions of the NFPA 13 and 25 standards, and the manufacturer's requirements and recommendations.
2. During testing, the Contractor shall visually monitor the fire alarm system on a continuous basis. If a real fire is detected and indicated on the panel, the Contractor shall notify building security officials and/or call the fire department.
3. The Contractor shall not sound the bells when the building is occupied. Any maintenance work, tests or inspections that could accidentally set off the bells while the building is occupied are prohibited unless authorized in writing by the Technical Authority.
4. Inspections and checks of the preaction and/or deluge systems shall be carried out at the same time as fire alarm system inspections (see FAS module). The Contractor is solely responsible for coordinating these activities.
5. A label or tag shall be affixed to each wet and dry system valve indicating the name of the person and organization that performed the inspection.

2. PLANNING

1. Whenever maintenance is to be performed, the Contractor shall notify the Building Technical Authority, in the prescribed manner, that the fire protection systems have to be inspected, tested, checked, repaired or otherwise worked on (see NFC 6.1.1.3.1).

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3. INSPECTION LOG

1. The Contractor shall keep a log of all tests carried out on the preaction and/or deluge systems and have it available for consultation by the competent authority. These logs must be available for consultation for the required time between any two inspections, maintenance jobs or tests but not less than two years (see NFPA 25, 2011 edition).
2. This log must show the date and time of the trip test as well as the name of the person and company that performed the test. The initial air and water pressure, trip pressure and operating conditions of the dry and wet system valves must also be recorded for comparison between past or future inspections. This log must also include the tripping time required during full-flow tests.

**4. DAILY INSPECTIONS
(WINTER ONLY)**

1. Inspect the heating equipment that maintains the temperature of the rooms or cabinets where the preaction and dry system valves are located to ensure the temperature is maintained at 4°C, except for cabinets equipped with a low temperature alarm, which must be inspected monthly.
2. **The Contractor is not required to conduct daily inspections under this contract. These inspections will be performed by others.**

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5. WEEKLY INSPECTIONS

1. Open the cabinet door. Turn the alarm line test valve to the "TEST" position. The electric horns and hydraulic bell should sound. The red common alarm and water flow lights should come on.
2. Turn the alarm line test valve to the "ALARM" position. The hydraulic bell should be disabled. Close the cabinet door.
3. Open the door of the electric section. Press and hold the reset switch. The electric horns should be disabled. The fault buzzer should sound. All panel lights should be on, indicating that everything is working. Release the reset button. Close the door of the electric section.
4. Check the FireFlex system during normal conditions.
5. **The Contractor is not required to conduct weekly inspections under this contract. These inspections will be performed by others.**

6. MONTHLY INSPECTIONS

1. Perform a weekly test.
2. Record the static water pressure indicated by the pressure gauge.
3. Open the cabinet door. Fully open the drain check valve. When maximum flow develops, record the residual water supply pressure (discharge) indicated by the pressure gauge.
4. Close the drain check valve. Close the cabinet door.
5. Compare the residual pressure from step 3 with previous tests. A sharp drop in residual pressure compared to

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previous tests may indicate that a valve is partially closed or that the water supply pipe is obstructed. If so, take the necessary steps to correct the situation.

7. THREE MONTHS INSPECTIONS

1. Check and test the low air pressure alarm, if installed, according to the manufacturer's recommendations.
2. Check the dry system valves by tripping the system, with the control valve fully open and the quick release valve, if installed, on. This is also to be done every time there is a modification to the system.
3. Inspect the quick release valves.
4. Check the low air pressure alarm, if installed, according to the manufacturer's recommendations.
5. Check the water inlet level.

8. ANNUAL INSPECTIONS

1. During annual trip tests, inspect the inside of the preaction and dry system valves and the condition of detection equipment.
2. Check the preaction valve trip at full flow. During these tests, adequately protect equipment that might sustain damage. These inspections should be performed during the summer according to the manufacturer's recommendations.
3. Check the water spray pattern from the nozzles to ensure they are not blocked and are positioned correctly. Clean clogged nozzles and their piping, then test the system again.

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4. Take pressure readings from the hydraulically farthest nozzle to ensure that the piping is not blocked or that none of the valves are partially closed. These readings should be compared to the original design pressures.
5. Test the maximum number of systems that must operate simultaneously in case of fire to ensure adequate water supply.
6. Check all devices that must be activated manually.
7. At the end of the full-flow tests, restart the system according to the manufacturer's instructions.
8. No grease or lubricant is to be applied to the surface of the preaction or dry system valve seats.
9. At the beginning of the heating season, check the low temperature alarm (if installed) inside the valve housing.
10. If installed, the automatic air pressure control devices must be inspected according to the manufacturer's recommendations at the same time as the trip test for the preaction system and/or dry system valves.
11. Check the entire system to locate and repair any leaks that are large enough to produce droplets that could set off an alarm or cause electrical components to malfunction.
12. During the annual trip test, thoroughly clean and if necessary repair and/or replace parts inside the preaction and dry system valves.
13. After each operation and before the start of winter every year, drain both the water and the air from low sections of the preaction systems.
14. Repair air leaks in the dry systems if they result in pressure loss of over 10 psi per week.
15. Trip test each dry pipe valve.

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9. EQUIPMENT LIST

1: COMPUTER ROOM: (N S I)

QUANTITY	DESCRIPTION
1	FireFlex preaction system
27	Fenwal 140 F heat detectors
1	ASCO solenoid valve
1	ASCO 24V solenoid valve
1	Flow switch
1	Sensor

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2: BUILDINGS:

	A	<u>LIST OF COMPONENTS FOR THE 7 UNITS, INCLUDING TOTALPAC®:</u>
	FLOOR SYSTEM:	
a1.	7	FireFlex Viking floor systems
a2.	7	4" main valves
a3.	7	Water pressure controls
a4.	21	Pressure indicators
a5.	54	Various valves
a6.	7	Electric horns
a7.	28	Pressure gauges
a8.	7	Test drains
a9.	7	Flow switches
a10.	21	Air pressure indicators
	B	
	4" WET PIPE FLOOR SYSTEM (LEAN-TO)	<u>LIST OF COMPONENTS FOR UNIT:</u>
b1.	1	4" main valve (floor)
b2.	1	Open/shut indicator
b3.	3	Pressure indicators
b4.	2	Bells
b5.	4	Pressure gauges
b6.	1	Alarm valve
b7.	1	Flow switch
	C	
	DRY PIPE SYSTEM (LEAN-TO, VENTILATION)	<u>LIST OF COMPONENTS FOR UNIT:</u>
c1.	1	4" main valve (system)
c2.	1	Open/shut indicator
c3.	1	Excess pressure pump
c4.	1	Air pressure regulator

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c5.	3	Pressure indicators
c6.	1	Electric horn
c7.	5	Pressure gauges
	D 6" MAIN SYSTEM (BASEMENT)	<u>LIST OF COMPONENTS FOR UNIT:</u>
d1.	1	6" main supply valve (water inlet)
d2.	1	Open/shut indicator
d3.	1	Excess pressure pump
d4.	3	Pressure indicators (alarm)
d5.	1	Electric horn
d6.	4	Pressure gauges
d7.	1	6" alarm valve
d8.	1	Flow switch

3: BASEMENT:

1.	1	TOTALPAC®, Viking
2.	1 36	ASCO 24V solenoid valve Fenwal 140 F heat detectors
3.	1	Victualic 708 sensor
4.	1	Potter PSS-10 sensor
5.	1	Potter WFS-5 waterflow switch

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4: GROUND FLOOR:

a1.	2	FireFlex
a2.		<u>SYSTEM: A</u>
a3.	30	Fenwal 140 F fixed heat detectors
a4.	1	ASCO 24V solenoid valve
a5.	1	ASCO solenoid valve (82106107)
a6.	1	United Electric pressure switch (J7X-5835)
a7.	1	NIBCO butterfly valve (WD3510-8)
a8.	1	Potter WFS-5 waterflow switch
b1.		<u>SYSTEM: B</u>
b2.	33	Firecycle 140 F fixed heat detectors
b3.	1	Auxiliary Function: Common Fault
b4.	1	Auxiliary Function: Flow
b5.	1	Auxiliary Function: Common Alarm
b6.	1	Auxiliary Function: Low Pressure
b7.	1	ASCO solenoid valve (HV2647571)
b8.	1	ASCO solenoid valve (82106107)
b9.	1	United Electric pressure switch (J7X-5835)
b10.	1	NIBCO butterfly valve (WD3510-4)
b11.	1	Potter WFS-5 waterflow switch

5: SYSTEM – 2nd FLOOR:

1.	1	FireFlex, Viking
2.	57	Firecycle 140 F fixed heat detectors
3.	1	ASCO solenoid valve (HV2647571)
4.	1	ASCO solenoid valve (82106107)
5.	1	United Electric pressure switch (J7X-5835)
6.	1	NIBCO butterfly valve (WD3510-8)
7.	1	Potter WFS-5 waterflow switch

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INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

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6: SYSTEM – 3rd FLOOR:

1.	1	FireFlex, Viking
2.	61	Firecycle 140 F fixed heat detectors
3.	1	ASCO solenoid valve (HV2647571)
4.	1	ASCO solenoid valve (82106107)
5.	1	United Electric pressure switch (J7X-5835)
6.	1	NIBCO butterfly valve (WD3510-4)
7.	1	Potter WFS-5 waterflow switch

7: SYSTEM – 4th FLOOR:

1.	1	FireFlex, Viking
2.	66	Firecycle 140 F fixed heat detectors
3.	1	ASCO solenoid valve (HV2647571)
4.	1	ASCO solenoid valve (82106107)
5.	1	United Electric pressure switch (J7X-5835)
6.	1	NIBCO butterfly valve (WD3510-4)
7.	1	Potter WFS-5 waterflow switch

8: SYSTEM – 5th FLOOR:

1.	1	FireFlex, Viking
2.	60	Firecycle 140 F fixed heat detectors
3.	1	ASCO solenoid valve (HV2647571)
4.	1	ASCO solenoid valve (82106107)
5.	1	United Electric pressure switch (J7X-5835)
6.	1	NIBCO butterfly valve (WD3510-4)
7.	1	Potter WFS-5 waterflow switch
8.	1	Cerberus Pyrotronics ILI-1 smoke detection products

FM-200 EXTINGUISHING SYSTEM MODULE (FM)

**FM-200 EXTINGUISHING SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

Project # K4C20-15-8708

1. GENERAL

- a. All tests and inspections of FM-200 extinguishing systems shall be compliant with the National Fire Code of Canada (NFC) and the latest editions of the NFPA 2001 standard.
- b. All handling, installation, inspection and checks of FM-200 extinguishing systems shall be performed by trained and qualified staff in accordance with the requirements of the most recent NFPA 2001 standard.
- c. During testing, the Contractor shall visually monitor the fire alarm system on a continuous basis. If a real fire is detected and indicated on the panel, the Contractor shall notify building security officials and/or call the fire department.
- d. The Contractor shall not sound the bells when the building is occupied. Moreover, any maintenance work, tests or inspections that could accidentally set off the bells while the building is occupied are prohibited unless authorized in writing by the Technical Authority.
- e. Before testing or inspecting the FM-200 extinguishing systems, the Contractor shall:
 - 1. Check that there are no ambient or operational conditions, such as a short-circuit or grounding issue with components, that could lead to the malfunction or accidental discharge of the system's extinguishing agent;
 - 2. Disarm the system security by switching off all AC or DC power to the control unit;
 - 3. Wait at least 40 seconds after disarming the system to allow the capacitor to discharge;

**FM-200 EXTINGUISHING SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

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4. Check the system components or field wiring using a ballistic galvanometer with an output current of no more than 50 mA;
 5. Check that the safety cap protecting the discharge valve is secure before handling or moving a cylinder;
 6. Handle cylinders carefully to prevent any damage to the gauge and other fittings;
 7. Ensure that the ambient temperature does not rise above 54°C.
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6. If the inspection turns up signs of rust on any of the system surfaces, immediately clean and repaint the surface in question. Then, conduct a pressure test as described below as well as an inspection as described in 5.1 to 5.7 above.

2. PLANNING

1. Whenever maintenance is to be performed, the Contractor shall notify the Building Technical Authority, in the prescribed manner, that the fire protection systems have to be inspected, tested, checked, repaired or otherwise worked on (see NFC 6.1.1.3.1).

**FM-200 EXTINGUISHING SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

Project # K4C20-15-8708

3. INSPECTION LOG

1. The Contractor shall keep a log of all tests carried out on the FM-200 systems and have it available for consultation by the competent authority.
These logs must be available for consultation for the required time between any two inspections, maintenance jobs or tests but not less than two years (see NFPA 25, 2011 edition).
2. This log must show the date and time of the trip test as well as the name of the person and company that performed the test. The pressure, trip pressure and operating conditions of the system valves must also be recorded for comparison between past or future inspections. This log must also include the tripping time required during full-flow tests.

4. DAILY INSPECTIONS

1. Check the cylinder pressure gauge to ensure it reads the correct operating pressure.
2. Check the pressure gauge on the cylinder's nitrogen actuator to ensure it reads the correct operating pressure.
3. **The Contractor is not required to conduct daily inspections under this contract. These inspections will be performed by others.**

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INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

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5. MONTHLY INSPECTIONS

1. Perform a general inspection of the cylinders and other equipment to check for any damage or missing parts.
2. Ensure that access to hazard areas, manual pull stations, nozzles and cylinders is clear and that nothing prevents the correct operation of equipment and distribution of inhibiting gas.
3. Inspect the pressure operated control heads on the cylinders for physical damage, deterioration, corrosion, distortion, cracks, dirt or loose couplings. Tighten loose couplings. Replace any damaged caps. Replace the pressure operated control head if damaged. Clean the pressure operated control head on the cylinder.
4. Inspect the electric control head on the cylinders for damage, corrosion and dirt. Check the flexible electrical line on the control head for damage and wear. Check the control head coupling and tighten if necessary. Check that the indicator is in the "SET" position, the pull pin is properly installed in the manual lever and the seal wire is intact. Replace the electric control head if damaged. Clean the electric control head on the cylinder.
5. Inspect the cylinders and valve assembly for leaks and physical damage, such as cracks, dents, distortion or worn parts. Check the burst disk and pressure gauge for any damage and replace them if necessary. If the pressure gauge reading is abnormal, remove and recharge the cylinder according to the manufacturer's instructions. Replace any damaged components. Clean the cylinder and components.
6. Inspect the brackets, straps and other mounting hardware and ensure that they are tightened properly and that none of the

FM-200 EXTINGUISHING SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS

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- components are damaged, broken, corroded or coated with oil, grease or grime. Clean thoroughly if necessary. Tighten all loose components and replace damaged ones.
7. Inspect the inhibiting gas actuation line (if required) to ensure that the support brackets are secure and that there is no physical damage, loose fittings, distortion, cracks or cuts. Clean thoroughly if necessary. Tighten all loose components and replace damaged ones.
 8. Inspect the nozzles to ensure they are not clogged with dirt or distorted. Clean clogged nozzles and their piping, then test the system again.
 9. Inspect the manual pull stations for damage, cracks, broken or cracked glass plates, dirt or distortion. Clean thoroughly if necessary. Replace any damaged glass plates and/or manual stations.
 10. Inspect the pressure switches for deformations, cracks, dirt or any other damage. Clean thoroughly if necessary. Replace any damaged switches.
 11. Weigh the cylinders according to the manufacturer's instructions. Carefully remove and replace the cylinders. Record the weight and date on a record card and attach it to the cylinder for inspection. If the net weight of the extinguishing agent is less than 95% of the original net weight, replace the cylinder with a new fully charged cylinder.
 12. If the cylinder is equipped with a flexible tape indicating the level of inhibiting gas, weighing is not necessary; however, the Contractor shall follow all the steps recommended by the manufacturer.

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6. SIX-MONTH INSPECTIONS

1. The electric control heads must be inspected every six (6) months to ensure proper operation. The amount of agent and the pressure in the cylinders must also be checked (see s. 7.1.3 of standard NFPA 2001, 2012 edition).
2. Remove all electric control heads for the hazard areas before proceeding with the inspection to avoid accidental discharge of the extinguishing agent. Let the electric control heads hang freely from the flexible electric conduit connections. Leave all the pressure operated control heads and pilot actuation hoses attached to the cylinders.
3. Operate the systems electrically from the control panel or by activating an electric manual pull station.
4. Ensure that all the electric control heads have operated, that is, the indicator on each electric control head has moved to the "RELEASED" position, or in the case of a control head (P/N 486500-01), that the actuating pin has moved to the fully actuated position. If any control heads have not operated, check the circuit for electric continuity to these particular heads and repeat the test. Replace all damaged heads. Repeat the test if any control heads have been replaced.
5. Follow the instructions on the label attached to each electric control head. Replace any damaged heads that failed to reset before reconnecting to cylinders. Control heads must be reset manually before being reconnected to the cylinder valves. Reattach all electric control heads to the threaded port on the cylinder valve or pressure operated control head. Tighten the swivel nut securely. Make certain each electric control head is in the "SET" position before reconnecting to cylinders in order to

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avoid accidental discharge of the
extinguishing agent.

7. TWO-YEAR INSPECTIONS

1. Purge the system according to the manufacturer's recommendations.
2. Remove any nozzles from the piping to allow foreign matter to blow clear.
3. Remove all pressure operated control heads from the cylinders.
4. Do not disconnect the flexible hose from the pressure operated control head while purging, as the system may accidentally discharge and severely damage equipment and/or cause serious bodily injury.
5. Open the distributing valves and keep them open long enough for thorough cleaning.
6. Blow out all piping with air or nitrogen to ensure it is not obstructed. Do not use water or oxygen to purge the system.
7. Reconnect all the control heads.

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8. FIVE-YEAR INSPECTIONS

1. Inspect the cylinders and perform a hydrostatic pressure test according to the manufacturer's recommendations. Hydrostatic tests **are not**
2. **required** for FM-200 cylinders. These tests are required only if the cylinders must be transported (see s. 7.2.1 of standard NFPA 2001, 2012 edition).
3. Inspect the flexible hose and perform a hydrostatic pressure test.
4. Perform a complete visual inspection of the outside of a cylinder that has been in continuous operation and that has never discharged. If the visual inspection identifies damage or corrosion, the cylinder will need to be emptied, retested and restamped in accordance with standard NFPA 2001.
5. Ensure that cylinders are not recharged and transported if more than five (5) years have elapsed from the date of the last test date stamped on the cylinder.
6. **Changes: five-year inspections are not required. Disregard this section.**

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9. TWELVE-YEAR INSPECTIONS

1. Perform a hydrostatic pressure test on the cylinders according to the manufacturer's recommendations. Hydrostatic tests **are not required** for FM-200 cylinders. These tests are required only if the cylinders must be transported (see s. 7.2.1 of standard NFPA 2001, 2012 edition).

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10. EQUIPMENT LIST

1: COMPUTER ROOM: (N S I)

#	QUANTITY	DESCRIPTION
1.	1	FM-200 system
2	15	Cylinders weighing a total of 6,223 lbs

2: GENERATOR ROOM:

#	QUANTITY	DESCRIPTION
1.	1	FM-200 system
2.	4	Cylinders weighing a total of 774 lbs

3: GENERATOR CONTROL ROOM:

#	QUANTITY	DESCRIPTION
1.	1	FM-200 system
2.	4	Cylinders weighing a total of 462 lbs

K CLASS EXTINGUISHING SYSTEM MODULE (K)

**“K” CLASS EXTINGUISHING SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

Project # K4C20-15-8708

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1. GENERAL

1. All tests and inspections of the “K” class extinguishing systems shall be compliant with the National Fire Code of Canada (NFC), or NFPA 17A-2013 or ULC 1254.6. The most restrictive code shall be apply
2. All handling, installation, inspection and checks of the “K” class extinguishing systems shall be performed by trained and qualified staff in accordance with the requirements of the most recent NFPA 2001 standard.
3. During testing, the Contractor shall visually monitor the fire alarm system on a continuous basis. If a real fire is detected and indicated on the panel, the Contractor shall notify building security officials and/or call the fire department.
4. The Contractor shall not sound the bells when the building is occupied. Moreover, any maintenance work, tests or inspections that could accidentally set off the bells while the building is occupied are prohibited unless authorized in writing by the Technical Authority.
5. Before testing or inspecting the K class extinguishing systems, the Contractor shall:
 1. Check that there are no ambient or operational conditions, such as a short-circuit or grounding issue with components, that could lead to the malfunction or accidental discharge of the system's extinguishing agent;
 2. Disarm the system security by switching off all AC or DC power to the control unit;
 3. Wait at least 40 seconds after disarming the system to allow the capacitor to discharge;
 4. Check the system components or field wiring using a ballistic galvanometer with an output current of no more than 50 mA;

**“K” CLASS EXTINGUISHING SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

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5. Check that the safety cap protecting the discharge valve is secure before handling or moving a cylinder;
 6. Handle cylinders carefully to prevent any damage to the gauge and other fittings;
 7. Ensure that the ambient temperature does not rise above 54°C.
6. If the inspection turns up signs of rust on any of the system surfaces, immediately clean and repaint the surface in question. Then, conduct a pressure test as described below as well as an inspection as described in 5.1 to 5.7 above.
 7. The refill shall be done according to ULC 1254.6 or NFPA 17A, section 7.4. The most restrictive code shall be use.
 8. Hydrostatic tests shall be done according to ULC 1254.6 or NFPA 17A, section 7.5. The most restrictive code shall be use.

2. PLANNING

1. Whenever maintenance is to be performed, the Contractor shall notify the Building Technical Authority, in the prescribed manner, that the fire protection systems have to be inspected, tested, checked, repaired or otherwise worked on (see NFC 6.1.1.3.1).

**“K” CLASS EXTINGUISHING SYSTEM MODULE
INSPECTION AND MAINTENANCE OF FIRE PROTECTION SYSTEMS**

Project # K4C20-15-8708

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3. INSPECTION LOG

1. The Contractor shall keep a log of all tests carried out on the K class system and have it available for consultation by the competent authority. These logs must be available for consultation for the required time between any two inspections, maintenance jobs or tests but not less than two years.
3. This log must show the date and time of the trip test as well as the name of the person and company that performed the test. The pressure, trip pressure and operating conditions of the system valves must also be recorded for comparison between past or future inspections. This log must also include the tripping time required during full-flow tests.

4. SIX-MONTH INSPECTIONS

1. Six-month maintenance shall be done according to ULC 1254.6 or NFPA 17A, section 7.3. The most restrictive code shall be use.
2. This log must show the date and time of the trip test as well as the name of the person and company that performed the test. The pressure, trip pressure and operating conditions of the system valves must also be recorded for comparison between past or future inspections. This log must also include the tripping time required during full-flow tests.

5. EQUIPEMENT LIST:

One K class extinguishing system with its piping and nozzle system. The system can be considerate as a “low usage” system.