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Canada

Fire Alarm & Sprinkler Systems Maintenance

2015/01/01

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SECTION 1 - GENERAL INFORMATION

1.1 Basic Requirements

a) The Inspection testing and maintenance shall be carried out by a company that has:

- Qualified staff (C.F.A.A. Or equivalent as determined by MOA RPS OSS),
- U.L.C. Listed Fire Alarm Company,
- U.L.C. Level III and IV competency unexpired.
- Five years' experience on same and similar systems.
- U.L.C. protected password.
- Proprietary, password protected access rights to site specific systems (fire alarm, addressable modules, sub systems including sprinkler, fire suppression).
- Access to material and parts.
- Unrestricted service bulletins.

1.2 Standards

a) All work performed as part of this scope shall comply with the latest edition of the applicable codes, standards, regulations that strictly meet the applicable provincial and federal requirements.

b) The Contractor shall, at all times, apply all regulatory based on the latest applicable edition of the referenced standards, codes, and regulation. The Contractor shall apply and notify the Museum should the referenced standard listed herein have been updated and superseded by a more recent version.

c) Should there be any discrepancies between the requirements listed herein and the applicable regulatory standard (ULC, NFPA, CSA or other), the most stringent requirement shall prevail and be applied. The contractor shall inform the Museum of any discrepancy.

d) WSIB and/or CCQ certificate to be supplied by the contractor upon request.

1.3 Scope

a) The Contractor shall furnish all services to execute the work required for the maintenance of any of the following applicable systems:

- Fire Alarm, including Smoke Detection System,
- Automatic Fire Suppression Systems,
- Wet Sprinkler System,
- Portable Fire Extinguishers,
- Kitchen Hood Fire Suppression systems,
- Fire Hydrant.

b) The fire alarm systems installed at 240 McLeod Street, Ottawa, Ontario is a microprocessor-based using a Life-Safety software program, which was specifically designed by SimplexGrinnell for its 4100U Fire Alarm Systems.

c) The Simplex 4100U system is solid-state technology and complies mainly of specially designed printed circuit boards.

d) The Contractor shall furnish all:

- Necessary tools, scissor lifts, ladders, to perform the work,
- Parts, components, equipment and labour for all inspections, testing, cleaning adjustments and preventive maintenance in keeping with the applicable referenced standard,
- Transportation and/or mileage costs.
- At the start of this contract, detailed updates of the systems and major components inventory,
- Detailed operational procedures of the complete system.

e) The Contractor shall immediately inform the Museum in writing within 10 days of necessary repairs not included herein as part of the work to be performed under this contract.

1.4 Emergency Call Centre

a) The contractor shall provide emergency call centre services on a 24/7/365, two (2) hour call back for the total period of the Contract, as specified herein at no extra cost to the Museum.

1.5 Work Hours

a) Perform all routine maintenance work during the regular working hours of the regular working days when permitted. Routine maintenance or alterations to the Fire Alarm System which could possibly inadvertently actuate the Fire Alarm System or disrupt regular Museum activities shall not be carried out during normal working hours, except for emergency service or repairs at the request of the Museum.

b) When emergency service or repairs are required, the Museum shall always be notified and the Fire Alarm System shall be shut off temporarily to prevent a possible false alarm.

c) The scheduled tests mentioned in the foregoing shall be carried out after normal working hours with the exception of those tests that may be done without any disruption to the Museum operations as deemed acceptable by the Museum. All auditory device tests or other test that may disrupt the Museum operations are to be completed in the morning by no later than 7:30am.

d) The Museum shall be notified a minimum of seven (7) working days and a maximum of fourteen (14) days prior to tentative tests to allow it sufficient time to make the necessary arrangements.

1.6 Operation

a) The Contractor shall maintain the equipment at its original performance level to provide a trouble free operation within the range required by the Museum.

1.7 Reporting

a) The Contractor shall:

- Submit to the Museum a detailed and complete typed computerized report (MS Office or similar) of the operational condition of all components in the systems including a list of parts replaced or to replace within fifteen (15) days of completion of said inspection,
- Where applicable, signature of personnel performing any of the identified tests as outlined in this maintenance specification shall be entered into the "Building Life Safety Compliance Manual",
- Provide all certificates of inspection upon completion.
- Life Safety Compliance Log to be filled out and signed by certified technician throughout the duration of the contract.
- One copy of field report to be left on site with the on-site Museum. Museum to receive copy of field reports, via fax or mail as well as on site with the Museum. The field report is to include all tasks that were completed, as well as the total duration of the tasks.

b) Reports shall:

- Separately list and identify each component and its condition,
- Identify all faults and/or recommendations noted during the inspection, testing and maintenance procedures shall be reported to the Museum. Immediate action shall be taken to have all faults noted during the inspection, testing and maintenance procedures corrected with the minimum possible delay (including a list of parts replaced).
- Be clearly signed and dated,
- Be received by the Museum as a condition of payment.

1.8 Sub-Contracting

a) No subcontracting to be allowed or permitted during the terms of this contract, without the prior and specific approval of the Museum.

SECTION 2 - FIRE ALARM SYSTEM

2.1 Monthly

2.1.1 Tasks

a) Testing and inspection of the Fire Alarm System shall be performed in accordance with CAN/ULC-S536-M2004 (or latest edition in use). Should there be any discrepancies between the requirements listed herein and the applicable standard, the most stringent requirement shall prevail.

b) Every month, the following inspections and test shall be conducted, under emergency power, to confirm the operability of the fire alarm system as per ULC. S536·M2004 (or latest edition in use):

- This emergency power shall consist of a battery and/or diesel generating system.
  - In all cases, a battery backup system shall be tested. Where fire alarm inspection coincides with a diesel generator test, the changeover to generated emergency power shall be confirmed. This test shall be coordinated with the Building Maintenance Service Provider (currently Black & McDonald)
- One (1) manual pull station shall be operated on a rotational basis, and the system checked for correct operation. Each succeeding test shall be carried out in a different zone and/or part of the applicable building.
  - The manual pull station shall be tested by following the operating instructions on the stations. A two-stage pull station, if applicable, shall be similarly tested, and first and second stage functions confirmed. During the period of system operation, the following shall be confirmed:
  - Verifying proper mechanical action of the lever mounted in the cover of the pull station, as well as ensuring proper reset at conclusion of test. Any parts that are subject to possible destructive testing shall be the liability of the contractor.
  - Verifying proper zone annunciation of operated pull station. If annunciation occurs at more than one location, all locations shall be confirmed. Operation of common audible and visual trouble signals shall be confirmed.
- All bells and other auditory devices and visual trouble signals (strobe lights etc.) of the tested area shall be individually inspected and verified for proper operation.
  - The verification of the bells or any other auditory device shall be restricted to the area in which the required one (1) pull station (initiating device) that is to be tested is located. This does not necessarily means the entire zone in which the designated pull station is located, but the immediate area (e.g. in the case of a general alarm in a ten story building where all the bells in every zone shall ring, only on the floor where the initiating device shall be located, shall the bells be verified),
  - Where, as a result of the rotational test of a pull station, causing a general alarm and more than one (1) zone is located in the immediate area (e.g. same floor), all bells and/or auditory devices in the two zones on that floor shall be verified,

- ❍ Where, as a result of the rotational test of a pull station causing a zone alarm and the zone is considered as local (same floor) all bells and/or auditory devices of that zone shall be verified, and
- ❍ Where, as a result of the rotational test of a pull station causing a zone alarm and the zone is not local (more than one floor) only the bells and/or auditory devices on the same floor as the initiating device shall be verified.
- ❍ All Bell/Strobe tests are to be completed by 7:30am.

□ Standby battery (if more than one (1) battery cell, each shall be individually inspected) for the following:

- ❍ Terminals are clean and lubricated.
- ❍ Terminal clamps are secure.
- ❍ Electrolyte level and specific gravity, where applicable, are as specified by the manufacturer.
- ❍ A test of battery voltage shall indicate full rated voltage of that battery.
- ❍ Excess heat, distortion and sulphation shall be investigated.
- ❍ Record on-site log, the results indicated in (c) (d).
- ❍ All deficiencies shall be corrected immediately

□ Auxiliary (ancillary) equipment subject to testing, inspection and/or verification. This auxiliary equipment includes but not limited to the following:

- ❍ Fan shutdown relays,
- ❍ Magnetic door closers,
- ❍ Dedicated smoke control fans,
- ❍ Elevator automatic recall,
- ❍ All fire dampers linked to the fire alarm system,
- ❍ Sprinkler and other extinguishing systems.

□ At the conclusion of the test, ensure the following:

- ❍ Ensure primary power indication lamp is on.
- ❍ Ensure system trouble signal and indicator is off.
- ❍ Ensure control panel is locked.
- ❍ Ensure AC power switch enclosure (where applicable) is locked.
- ❍ Ensure all components of the system are reset or returned to the normal standby mode.

2.2 Annual

2.2.1 General

a) Testing and inspection of the Fire Alarm System shall be performed in accordance with CAN/ULC-S536-M2004.

b) Upon written request from the Contractor, the Museum shall be responsible for making all arrangements with other stakeholders who may be required to provide assistance, such as elevator, Main Electrical Vault, sprinkler, monitoring, etc. so all devices can be inspected.

c) The Museum will also be responsible for notifying tenants in regards to the date, times, etc. when testing will be performed.

2.2.2 Control Unit

a) Control units shall be inspected, tested, and verified to confirm the operability of all functions in accordance with manufacturer's recommendations by:

- □ Verification of operation of all lamps installed on control unit, such as power-on, common trouble, ground detection, alarm signal silence, alarm operation, and all other trouble lamps.
- □ The operation of the alarm signals shall be checked, including the verification of all supervisory circuits.
- □ All modules or plug-in devices to be secure and properly aligned, with all exposed electrical contacts maintained in a clean condition. (E.g. no Oxidation, grime or dirt build up, dry, etc.).
- □ Ensure all reset functions are tested and verified as to proper operation and are in-the normal mode at conclusion of test.
- □ Exterior and interior surfaces (all types) are clean and free of dirt and dust and that the control cabinet is locked.
- □ All replaceable over-current devices are correctly rated for what they protect, are all the same make and manufacture, and replace, if required.

2.2.3 Battery and Battery Charging System

a) The battery and all related equipment shall be inspected as to proper operation, operating parameters, and cleanliness. Where the battery is mounted external to the control cabinet, it shall be provided with adequate physical protection from damage, abuse and tampering. *If there is more* than one (1) battery or cell, each shall be individually inspected and tested for the following: -

- □ Correct electrolyte level, (where applicable), specific gravity (where applicable), integrity of all connections, sulphation, corrosion and dryness between terminal posts. All leaking batteries shall be replaced.
- □ The operating parameters of the battery test of system shall include:
  - ❍ System operation for a minimum of two hours in the supervisory mode and ten minutes in the general alarm mode, or 24/30 or 24/120, as per CAN ULC 536/97,
  - ❍ At the end of the ten minute general alarm mode of operation and before restoration of normal power, the battery terminal voltage shall be measured and recorded in on-site log. Voltage must read a minimum of 90% of battery rated voltage,
  - ❍ At no time during this test shall the system be left unattended.

2.2.4 Pull Station (Manual)

a) All manual pull stations shall be tested.

b) Where applicable, both stages and sequence of operation shall be confirmed. The mechanical action of the lever mounted on the cover shall be verified as to proper

operation. Any parts that are subject to possible destructive testing shall be the responsibility of the contractor.

2.2.5 Audible and Visual Signal Appliances

a) All audible and visual signal appliances shall be tested for the following (where applicable):

- □ Operate simultaneously on emergency power for a period of thirty minutes. (If battery power, battery must maintain a minimum of 90% of rated (voltage after test).
- □ The audibility and visibility of all audible and visual alarm signals shall be confirmed as to strength of signal.
- □ Audible alarms shall be heard throughout the facility. Record and report sound levels (dB) for each room/area.
- □ Visual alarms shall be clearly seen throughout all points of designated visual alarm area.
- □ Check tightness of shell or housing (e.g. bells), and ensure there are no obstructions or tampering to any moving part or to light emitting properties (e.g. strobe lights).
- □ All Bell/Strobe tests are to be completed by 7:30am unless notified otherwise / approved by the Museum.

2.2.6 Ancillary Devices and Equipment

a) The following devices and equipment interlocked with relays that are controlled by the fire alarm control panel, shall have their operation in the event of an alarm as specified by the N.F.C., verified, and at the conclusion of such test, ensure that such devices and equipment are reset or returned to their normal mode. These tests are to be carried out in conjunction with the relevant service contractors or other personnel responsible for those systems, at no extra cost to Her Majesty.

b) The requirement for the assistance of on-site personnel or relevant service contractor assistance shall form no part of this contract. (Such ancillary devices and equipment may include but not restricted to the following:

- □ Fan shutdown relays (air handling units, non-smoke).
- □ All door closing devices (hold open devices).
- □ Elevator automatic recall.
- □ Dedicated Smoke Exhaust / Control Fans.
- □ Fire Dampers.
- □ Fire Doors.

2.2.7 Detectors

a) All heat and smoke detectors shall be tested and verified as to proper operation and sensitivity according to manufacturer's recommendations by:

- □ Ensuring that all such devices are in no way damaged or covered with paint.
- □ The testing of heat detectors shall utilize some form of radiant heat as recommended in CAN/ULC-S536/97.

b) All Smoke Detectors checked for proper operation using "Multi-Mist ™" "Smoke-up ™" dry aerosol only, or similar, as accepted by the Museum.

c) Non restorable heat detectors may be tested on a lot sampling basis when warranted by age or evidence of deterioration due to environmental conditions as recommended in CAN/ULC-536/97 and M-86.

d) The cost of replacement detectors, where applicable, shall be paid for by the Client.

e) Supervisory circuits are electrically (e.g. grounds, continuity etc.) and mechanically sound.

f) A cleaning schedule for smoke detectors, based on the environmental conditions prevailing and the results indicated in previous paragraph, shall be established and maintained.

2.2.8 Water Flow Alarm Devices

a) All water flow alarm devices are to be tested and verified (weather permitting, but at least once per year) for the following:

- □ Audible and/or visual signals are operating properly and according to manufacturer's specifications.
- □ Proper notification procedures are in place to avoid false alarms. (E.g. building owner, monitoring service, and fire department).
- □ All valves controlling water supply to alarm devices are locked or sealed in the open position.

2.2.9 Fire Sprinkler Valves

a) Fire sprinkler valves with electrically supervised tamper switches shall be tested to confirm the following:

- □ The movement of the valve operating mechanism from its normally open position results in an audible signal (distinct from alarm and alert signals) and a distinct visual indication at the required annunciator(s).
- □ Pressure supervisory switches shall be tested by increasing or decreasing' pressure beyond pre-set limits (test to be performed by those responsible for the Sprinkler System), and verifying audible signal.

2.2.10 Control Sequences (Life-Safety System Matrix)

a) The Fire Alarm System sequences shall be tested entirely on “Maintenance Relay by-pass” mode and sporadic verifications shall be demonstrated to the Museum. The Museum will assist the Contractor in the verifications and decide which zones to demonstrate proper operation of the system and its sequences.

b) See Appendix A.

SECTION 3 - WET SPRINKLER MAINTENANCE

3.1 Systems

a) Sprinklers, Automatic Wet System.

3.2 Fire Code Requirements

a) The Canada Labour Code, Part XVII, the National fire Code (NFC) and the N.F.P.A. and CAN ULC.

b) Sprinkler System per National fire Code (NFC) and N.F.P.A. Where applicable.

c) Fire Pumps National fire Code (NFC) 1995.

3.3 Monthly Sprinkler System Test And Inspection

a) Monthly Test and Inspection of Sprinkler System as per National Fire Code (NFC) 6.5.3.4.(2)

- □ Conduct an alarm test using the by-pass connection located at the Sprinkler valve.
- □ Open valves until alarms ring, then close valves and reset alarms.
- □ Check this operation with the Fire Alarm System to verify alarm condition on the panel.
- □ Confirm signals with off premises alarm services.
- □ Supply a complete set of documentation of the Test and Inspection.

3.4 Bimonthly Test and Inspection of Sprinkler System

3.4.1 Bimonthly Test and Inspection of Sprinkler System as per National Fire Code (NFC) 6.5.3.4.(2)

a) Transmitters and water flow actuated electrical supervisory signal devices to be tested by operating the supervisory signal devices.

b) Electrically supervised valves to be inspected in accordance with National Fire Code (NFC) 6.5.4.1.(3)

c) Test all signalling equipment, including water flow activated devices and wet pipe sprinkler systems.

d) Water flow activated devices will be activated by opening the "inspectors" test pipe.

e) Proper receipt of the signals will be verified at the fire alarm panel.

f) Supply a complete set of documentation of the Test and Inspection.

3.5 Semi-Annual Sprinkler System Inspection

3.5.1 Semi-annual Test and Inspection of Sprinkler System as per National Fire Code (NFC)

a) Test and inspect valve supervisory switches and devices and all other sprinkler system supervisory devices.

b) All supervisory devices will be tested, such as monitory sprinkler valves, high/low water pressure, etc.

c) Supply a complete set of documentation of the Test and Inspection.

3.6 Annual Sprinkler System Test And Inspection

a) A complete operational verification of each component within the total Sprinkler, Automatic Wet system shall be carried out once during each contract year as per the N.F.C. and NFPA 25.

b) Inspect and test Control Valves to ensure that they are in the appropriate open or closed position. Check valves that are in the normally opened position to ensure that they are locked, or equipped with a Tamper Switch.

c) Conduct Main Drain Flow Test of the sprinkler system water supply.

d) Inspect and test associated access pressure pumps and jockey pumps to ensure that they are in good condition and can perform intended function.

e) Inspect Fire Departments connections to ensure that they are in good condition (i.e., couplings free, caps in place, etc.)

f) Inspect and test that electric alarms and supervisory alarm test satisfactorily.

g) Check spare sprinkler heads and wrench.

h) Supply a complete set of documentation of the Test and Inspection.

i) Wet: (Alarm valves complete with pressure type flow switches and/or vein type flow switches)

j) Conduct a Sprinkler System Alarm test using the hydraulically most remote test valve.

k) Conduct a complete visual inspection of all exposed sprinkler heads, hangers and piping for proper installation.

l) Conduct testing on antifreeze system(s); where applicable.

SECTION 4 - HYDRANTS

4.1 Annual Hydrant Test and Maintenance

a) Perform all tests, including a flow test, and report on as per requirements of the National Fire Code (NFC) and NFPA 25.

b) Inspect and test the operation of the hydrant by flowing water with the main valve open.

c) Ensure the hydrant is free of obstructions and ready for use at all times.

d) Ensure the hydrant is free of snow and ice accumulations.

e) Remove caps and inspect for wear, rust or obstructions.

f) If caps are missing, replace caps, inspect for obstructions or accumulated refuse.

g) Inspect the hydrant barrel for water accumulation within the barrel when the main valve is in the closed position.

h) Should the barrel contain water, the drain valve shall be inspected.

i) Should the barrel contain water due to poor drainage, measures shall be taken to prevent freezing during winter conditions.

j) Confirm and report on gallons per minute and color coding of hydrant by flowing water and measuring flow.

k) Confirm proper threads on barrel of hydrant as per Ottawa Fire Department

SECTION 5 - PORTABLE FIRE EXTINGUISHERS

5.1 Fire Code Requirements

a) The Canada Labour Code, Part XVII, the National fire Code (NFC) and the N.F.P.A. and CAN ULC.

b) Extinguishers including portable fire extinguishers as per N.F.P.A. 10 Standards.

5.2 Monthly Inspections

a) Monthly inspections are performed by on-site Building Maintenance Technicians (not in Fire Alarm Maintenance Contract).

5.3 Annual Inspection

a) The Portable extinguishers shall be inspected to include as per the required monthly inspection, and:

- ☐ Maintenance of mechanical parts.
- ☐ Examination of extinguishing agent and expelling means.
- ☐ A visual inspection to ensure that all fire extinguishers are in their designated location and mounted at the proper height.
- ☐ Ensure that there are no obstructions to accessibility or visibility.
- ☐ Ensure that the operating instructions on the nameplate are legible and facing outward.
- ☐ Verify that all safety seals and tamper indicators are not broken or missing.
- ☐ Determine the fullness by weighing.
- ☐ Determine the pressure by weighing or observing gauge.
- ☐ Examine for any obvious physical damage, corrosion, leaks and/or clogged nozzles.
- ☐ Ensure that the extinguisher is the proper type and coverage.

5.4 Fire Extinguishers' List

5.4.1 See Appendix B

SECTION 6 - KITCHEN HOOD FIRE SUPPRESSION SYSTEMS

6.1 Fire Code Requirements

a) The Canada Labour Code, Part XVII, the National fire Code (NFC) and the N.F.P.A. and CAN ULC.

b) Kitchen Hood Fire Suppression Systems as per N.F.P.A. 17-A Standard.

6.2 Semi-Annual Inspections

a) The Kitchen Hood Fire Suppression Systems shall be inspected to include as per the required semi-annually inspection requirements, and:

- Check, Verify and record the operational readiness of all field devices (manual pull station, bells, control panel, etc).
- Check, Verify and record the operation of all shutdown functions.
- Check all fusible links and/or detectors for operational readiness.
- Check, measure and record condition of cylinder and agent.
- Change all fusible links if required.
- Leave system in operating condition.
- Supply a complete set of documentation and annual certificates of the test and inspection.

SECTION 7 - Summarized List Of Equipment

7.1.1 Following is a list showing an approximate number of components incorporated in this system:

Equipment	Description	Quantity
FCAP	Fire Alarm Control Panel	1
XPD	Fire Alarm Transponder	4
CRT	Computer Reporting Terminal	1
PRT	Printer	
ANN	Annunciator	1
S	Smoke Detector	488
DS	Duct Smoke Detector	66
AUD	Audible Device – Speaker/Horn/Bell	199
V	Visual Device	199
RHT/HT	Heat Detector – Fixed/Rate of Rise	26
M	Manual Pull Station	64
FS	Flow Switch	12
TS	Tamper switch	24
PS	Pressure Switch	1
R	Relay	45
AD	Ancillary Device	
AUX	Auxiliary Device	
PIV	Post Indicating Valve	
FE	Fire Extinguishers; See Appendix B for all the details	190
FHC	Fire Hose Cabinet	
KH	Kitchen Hood	2
SH	Special Hazard	
FP	Fire Pump	2
SP	Stand-by Pump	
ELBP	Emergency Light Battery Pack	
REL	Remote emergency Light	
FH	Fire Hydrant	
BFP	Backflow Preventer	
BEM	Beam Detection	2
EOL	End of Line	75
ISO	Isolator	64

□ All inventory in place as of March 31, 2015.