

## 5.22 Life Safety Systems

### 5.22.1 Codes, Regulations and Standards

Comply with all applicable codes, regulations and standards. This list is not meant to restrict the use of additional codes, regulations or standards.

#### 1. National Fire Protection Association (NFPA) Standards:

- a) NFPA 10: Standard for Portable Fire Extinguishers
- b) NFPA 13: Standard for the Installation of Sprinkler Systems
- c) NFPA 13A: Inspection, Testing and Maintenance of Sprinkler Systems
- d) NFPA 13R: Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies
- e) NFPA 14: Standard for the Installation of Standpipe and Hose Systems
- f) NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection
- g) NFPA 25: Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
- h) NFPA 71: Installation, Maintenance, and use of Central Station Signalling Systems
- i) NFPA 72D: Installation, Maintenance, and use of Proprietary Protective Signalling Systems
- j) NFPA 72E: Automatic Fire Detectors
- k) NFPA 70E: Standard for Electrical Safety in the Workplace

#### 2. CAN-ULC Standards:

- a) CAN-ULC-S524: Standard for the Installation of Fire Alarm Systems
- b) CAN-ULC-S525: Audible Signal Devices for Fire Alarm Systems, Including Accessories
- c) CAN-ULC-S526: Visible Signal Devices for Fire Alarm Systems, Including Accessories
- d) ULC-S527: Standard for Control Units for Fire Alarm Systems
- e) CAN-ULC-S528: Manual Stations for Fire Alarm Systems, Including Accessories
- f) CAN-ULC-S529: Smoke Detectors for Fire Alarm Systems
- g) CAN-ULC-S530: Heat Actuated Fire Detectors for Fire Alarm Systems
- h) CAN-ULC-S531: Standard for Smoke-Alarms



- i) ULC-S533: Standard for Egress Door Securing and Releasing Devices
  - j) CAN-ULC-S536: Inspection and Testing of Fire Alarm Systems
  - k) CAN-ULC-S537: Verification of Fire Alarm Systems
  - l) CAN-ULC-S541: Speakers for Fire Alarm Systems, Including Accessories
  - m) ULC-S548: Alarm Initiating and Supervisory Devices for Water Type Extinguishing Systems
  - n) CAN-ULC-S552: Standard for Maintenance and Testing of Smoke-Alarms
  - o) CAN-ULC-S553: Standard for Installation of Smoke-Alarms
  - p) CAN-ULC-S576: Mass Notification Standard
  - q) CAN-ULC-S575: Commissioning of Life Safety and Fire Protection Systems.
  - r) CAN-ULC- S573: Installation of Ancillary Services
  - s) CAN-ULC-S571: Flame Detectors
  - t) CAN-ULC-S567: Door Closers and Electromagnetic Door Holders
- 3. The Uniform Building and Accessibility Standards Act (Alberta)
  - 4. The Occupational Health and Safety Act and Regulations (Alberta)
  - 5. Alberta Building Code
  - 6. Alberta Fire Code
  - 7. University Of Calgary Standards

#### **5.22.2 General**

- 1. All sprinkler systems designs, new construction or renovation must be reviewed by the University of Calgary's underwriter prior construction.

#### **5.22.3 Suppression Standpipe and Hose System**

- 1. Piping preferred to be black steel Schedule 40 threaded or grooved. Grooved mechanical joints shall be Victaulic or Grinnell Gruv-lok only. Copper piping permitted only in areas susceptible to magnetic fields.
- 2. Provide adequate drainage locations to outside of buildings for testing and draining all portions of sprinkler systems. Coordinate suitable locations for exterior drains that accommodate full flow without damaging building or landscaping.
- 3. The U of C fire protection systems shall meet the latest applicable NFPA codes as modified by the U of C authority or the City of Calgary Fire Department policy in effect at the U of C.

4. Sprinkler system shall be hydraulically designed by the sprinkler engineer with shop drawings (sealed and signed by a professional engineer practicing in the Province of Alberta and assuming full responsibility for the installed system) submitted showing all piping and sprinkler head locations. Submit detailed installation drawings and design calculations for approval to the Consultant and the University of Calgary to review, prior to commencing work. No work shall commence prior to obtaining approved drawings from this authority. The sprinkler professional engineer shall supply all building code scheduling and submit to the Project Manager for its distribution to the interested parties.
5. Information on water supply available for firefighting must be obtained from University of Calgary Utilities.
6. All piping and system components must be fully accessible for maintenance purposes.
7. Alarm only emergency conditions-do not alarm test conditions.
8. All buildings shall be fully sprinklered. In general, where a renovation occurs in a building not currently sprinklered, the renovated area is to be brought up to current code. Confirm requirements with project manager prior to design.
9. The sprinkler piping layout shall generally follow the tree system. Crossmains shall be continuous in size from the connection at the standpipe to the end of the run. Crossmains shall be a minimum of 50 mm (2"NPS) in light hazard areas and 80 mm (3"NPS) in ordinary hazard areas.
10. Design mechanical rooms as Ordinary Hazard Group I. Design library spaces and laboratories as Ordinary Hazard Group II.
11. Pressure gauges to have dual scales; PSI and kPa.

**5.22.4 Fire Suppression Sprinkler Equipment**

1. Provide dry sprinkler systems/heads in areas subject to freezing temperature and where leads from a wet system would result in an unacceptable level of damage to records, equipment or research (e.g. Main electrical rooms and main IT rooms).
2. Pre-action type sprinkler system shall be installed in high voltage electrical room, main electrical room and main telecommunication rooms complete with metal pan shielding electrical equipment. Coordinate with Owner if a pre-action type sprinkler system is required in any other area in doubt as early as at Schematic Design phase.
3. Provide quick response heads in all locations except mechanical rooms. Sprinkler heads in mechanical rooms shall be high temperature (140 degrees C / 284°F).
4. Standpipe system to have a common flow switch.
5. Sprinkler system to have a common flow switch.
6. Standpipe and sprinkler systems to have a low pressure monitor switch.
7. Standalone pre-action control panels aren't acceptable. All pre-action and special extinguishing systems shall be connected to a dedicated networkable Simplex suppression release control panel (4100ES) or shall be connected directly to the building fire alarm system. Either connection shall be in accordance with the requirements of NAPA 72.
8. Pre-action and special system panels shall have 24 hours (min) of battery backup capacity.

**5.22.5 Fire Alarm**

1. Fire Alarm must be equipped for two stage but operate as single stage
2. Fire alarm must have one way communication via speakers
3. Fire alarm must have synchronized strobes
4. Fire alarm must have addressable detection devices
5. Fire alarm must have bypass switches for Fans, Elevator, doors, audio/visual, city connection, smoke evacuation and any other custom shut down
6. Fire alarm panel to be installed in a room if building is classed as a high rise
7. Fire alarm must have university approved custom alarm tones and messages
8. Audio riser must be wired in class "A"
9. Visual riser must be wired in class "A"
10. Detection riser must be wired in class "A"
11. Audio branch runs can be in the same conduit if not longer than 10' if longer than 10' they must be run as class "A"
12. Audio wiring on floors must be class "A" and use A & B circuits
13. Visual wiring on floors must be class "A"
14. Detection wiring on floors can be class "B" but class "A" are preferred
15. Refer to Section 5.17.7 for information on detector locations.
16. New elevator code to be used. Smoke detectors in all elevator vestibules, top of shaft, elevator machine room
17. Strobe to be installed outside building at fire department response point
18. Fiber network to be connected from main telecom room (it connects after node box to existing network) to fire alarm head end
19. Copper monitor to be connected from tunnel to fire alarm
20. One pair of wires to run from head end panel to all nodes for door monitoring-
21. Monitoring of emergency generator run and fail
22. Monitoring of fire pump run and fail

23. Monitor sprinkler low pressure.
24. Common flow monitor on standpipe system
25. Common flow monitor in sprinkler risers.
26. Monitor hazardous gas detection systems in the building.
27. VESDA smoke detection systems are preferred in building atriums and raised floor applications where access for maintenance is difficult.

#### **5.22.6 Portable Fire Extinguishers**

1. In general, mounting height for fire extinguishers in cabinets is 900 mm (3 ft) above floor. Design shall incorporate the requirements of NFPA 10 1-6.10 (latest edition) for each project application. Note: Extinguisher mounting height varies depending on the weight of the fire extinguisher. Mounting height is governed by NFPA 10 1-6.10

#### **5.22.7 Approved Manufactures**

1. Fire Alarm: Simplex Grinnell
2. Sprinkler Heads: Central, Reliable, Tyco, Viking
3. Hand Held Fire Extinguishers: NFE, Pyro-Chem/Flag Fire
4. Fire Pumps: Darling, Aurora, Peerless, Leitch, Armstrong

#### **5.22.8 Spare parts list.**

<b>Service</b>	<b>Part</b>	<b>Quantity</b>
Fire alarm system	Smoke detectors of each type.	Two (2)
	Heat detector of each type.	One (1)
	Speakers.	Two (2)
	Visual signal appliance.	One (1)
	Control modules.	Two (2)
	Monitor modules.	Two (2)
	Manual stations.	Two (2)
	Speaker/strobe appliances.	Two (2)
Sprinkler system	0 to 299 heads	Six (6)
	300 to 1000 heads	Twelve (12)
	Over 1000 heads	Twenty four (24)

**Revision History**

<b>Revision Date</b>	<b>Version</b>	<b>Description</b>
July 2018	1.1	Baseline version
August 10, 2023	1.0	Added Revision History table to end of document and reset to Version 1.0.