

ADVISORY**COMMISSIONING AND TESTING****INTEGRATED FIRE PROTECTION AND LIFE SAFETY SYSTEMS**

BUILDING CODE SERVICES

**COMMISSIONING AND TESTING
INTEGRATED FIRE PROTECTION AND LIFE SAFETY SYSTEMS****PURPOSE AND SCOPE**

The commissioning and testing of integrated fire protection and life safety systems within a building is governed by CAN/ULC – S1001. The complexity of these systems and their interaction is dependent on the size, occupancy classification, construction type, applicable requirements of the Ontario Building Code and installation and performance standards governing individual systems and proprietary products.

This advisory is also intended to outline the testing and commissioning requirements of individual fire and life safety systems (acceptance testing) in general terms.

CAN/ULC – S1001

CAN/ULC S1001 provides a methodology for verifying and documenting that required fire protection and life safety systems function in unison and are tested to confirm their interdependent operation. The standard addresses the requirement for integrated systems testing noted in the Ontario Building Code Division B, 3.2.10. and 9.10.18.10.

CAN/ULC – S1001-11 defines **Integrated Fire Protection and Life Safety Systems** as *A combination of two or more fire protection and life safety systems, which may or may not be physically connected with one another, but that are designed to operate together to achieve an overall fire protection and life safety objective.*

CAN/ULC – S1001 is not intended to assess individual fire protection and life safety systems. The installation, operation and function of individual systems are assessed in accordance with applicable referenced standards and proprietary installation requirements.

CAN/ULC S1001 provides a framework for the testing and review of integrated fire protection and life safety systems and is structured to address testing of these systems as they apply to 4 testing categories;

1. New Buildings - Integrated systems testing process of new systems
2. Addition to Existing Building - Integrated testing for modified systems – Upgraded or modified existing systems where previous Integrated systems testing has been performed.

3. Retro - Integrated systems testing –Testing of integrated systems that have not previously undergone initial integrated testing.
4. Maintenance - Periodic integrated systems testing - Testing of existing integrated systems that had previously undergone integrated testing and is essentially a maintenance program for existing systems and is governed under the authority of the Ontario Fire Code.

FIRE AND LIFE SAFETY SYSTEMS CONSIDERED

Fire alarm system	Freeze protection systems
Mass notification systems	Fixed fire suppression systems
Elevators	Cooking suppression systems
Emergency generators and power supply	Hold-open devices
Audio visual and lighting control systems	Electromagnetic locks
Notification systems	Smoke control systems
Sprinkler systems	Hazardous protection
Standpipe systems	Monitoring
Fire pumps	Smoke alarms
Water supply	Pre-action systems
Water supply control valve	On site water storage for fire fighting

The list of systems noted above is intended for reference and should not be considered exclusive or limited as systems integration may include other technologies, devices and equipment that are unique, highly specialized or proprietary in nature.

INTEGRATED TESTING PLAN

The development of an integrated testing plan and completion of testing is to be undertaken under the direction of an integrated testing coordinator and is defined in CAN/ULC – S1001-11 as *“The person, firm, corporation, or organization responsible for the development and implementation of the integrated testing plan”*.

An integrated testing plan shall be submitted to the municipality prior to issuance of a building permit.

CAN/ULC – S1001 outlines provisions for integrated testing and provides templates and sample forms to guide the preparation of an integrated testing plan, testing procedures and final integrated test report.

INTEGRATED TESTING COORDINATOR

The preparation of an integrated testing plan, the testing of integrated systems and preparation of a final testing report are required to be conducted by an integrated testing coordinator.

Persons undertaking responsibility for conducting the integrated systems testing shall be a professional engineer possessing a current certificate of authorization or a ULC certified Integrated Testing Coordinator.

Persons undertaking the role and responsibility for integrated testing shall be identified on the Confirmation of Commitment by Owner form (including their accreditation and professional designation) prior to building permit issuance.

Where applicable, the integrated testing coordinator is responsible for assessing existing systems and related previous testing of individual fire and life systems required for the integrated systems test in accordance with CAN/ULC S1001.

UNDERWRITER LABORATORIES - INTEGRATED TESTING COORDINATOR PROGRAM

Underwriter Laboratories of Canada (ULC) has established a program for qualification of integrated testing coordinators. Integrated systems testing service providers that have been assessed and qualified may undertake the role of integrated systems coordinator.

ULC recommends companies that perform verification of the fire alarm systems in accordance with CAN/ULC-S537 are not permitted to conduct integrated systems testing on the same building in accordance with CAN/ULC-S1001 under the ULC listing program.

COMMISSIONING, VERIFICATION AND TESTING OF INDIVIDUAL FIRE PROTECTION AND LIFE SAFETY SYSTEMS

Fire protection and life safety systems installed in a building may operate in isolation or function in concert with other safety systems to suppress fire, control smoke, maintain function of critical functions, facilitate egress and exiting or provide early warning to occupants that will assist in facilitating evacuation of the building.

CAN/ULC – S1001 requires all initial testing, commissioning and verification of individual fire protection and life safety systems to be completed prior to the integrated systems testing.

TESTING OF INDIVIDUAL SYSTEMS – ACCEPTANCE TESTING

Prior to the occupancy of a building or part of a building, all fire protection and life safety systems must be tested to ensure compliance with the requirements of the Ontario Building Code, CAN/ULC S1001, standards governing each specific system, proprietary installation requirements and regulations governed by other agencies such as the Electrical Safety Authority, Technical Standards and Safety Authority.

Building officials witness a demonstration of functioning fire protection and life safety system(s) following completion of acceptance testing and submission of accompanying reports confirming systems operation. The person(s) responsible for acceptance testing of each system(s) are required to submit verification and commissioning reports to the building official in advance of a scheduled inspection and system demonstration.

COMMISSIONING, VERIFICATION AND TESTING OF INTEGRATED FIRE PROTECTION AND LIFE SAFETY SYSTEMS

Fire protection and life safety systems can be either physically connected or linked to ensure activation of one system can cause the activation of another. Interconnection may include electrical, optical, wireless transmissions, or data transfer protocols.

TESTING OF INTEGRATED SYSTEMS

CAN/ULC S1001 outlines categories of testing for new and existing buildings including mandating a schedule for follow up testing (maintenance) of fire protection and life safety systems beyond the completion of the construction.

CAN /ULC S1001 states that tests required by Section 6, Integrated Systems Testing Requirements shall include a functional operation of the device or system.

RENOVATION AND EXTENSION OF EXISTING BUILDINGS

PREVIOUSLY TESTED SYSTEMS

Where a fire or life safety system is modified or extended and the system was previously tested under CAN/ULC-S1001, only the portions affected by the alteration will require testing. The report addressing the previous test is required to be provided as a condition for accepting prior testing of existing systems.

SYSTEMS NOT PREVIOUSLY TESTED

Where an existing building undergoes construction (addition, alteration or renovation), modified or extended fire or life safety systems that were not previously tested under CAN/ULC-S1001 are required to be tested in accordance with Section 5 of the standard. Provision for testing the existing system is required to be identified in the integrated testing plan.

MAINTENANCE OF EXISTING BUILDINGS

CAN/ULC – S1001 includes provisions for ongoing monitoring and maintenance of integrated fire protection and life safety systems. This provision is governed under the Fire Marshall’s Act and Ontario Fire Code. It is the owner’s responsibility to ensure the integrated systems are re-tested within intervals not exceeding 5 years in all categories listed in the standard.

PHASED OCCUPANCY

CAN/ULC S1001 provides for the phased occupancy of a building provided the integrated testing plan;

- a) Has been developed for the entire building and takes into consideration integrated tests that will be required for each of the occupancy phases within the overall integrated testing plan,
- b) Ensures that the integrated systems have been tested for proper operation for each of the areas to be occupied as part of the phased occupancy,
- c) Provisions for phased occupancy comply with Ontario Building Code conditions for occupancy including substantial completion.

EXCEPTIONS

CAN/ULC – S1001 does not provide any exceptions or exemptions for testing integrated life and fire safety systems.

CONSULTANTS REPORTS AND DOCUMENTATION

INDIVIDUAL SYSTEM REPORTS ACCEPTANCE TESTING AND COMMISSIONING

Each fire protection and life safety system is tested, verified and operational readiness confirmed by the respective authority prior to the integrated systems testing.

The commissioning reports for individual systems are submitted to the building official prior to occupancy inspection.

INTEGRATED SYSTEMS TESTING REPORT

A final integrated testing report is completed by the integrated testing coordinator. As specified by CAN/ULC – S1001, the report shall consist of the Integrated Testing Plan, documentation collected during integrated testing implementation phase, integrated testing forms for initial test, integrated testing forms for re-tests and schedules for life cycle and maintenance testing.

The final integrated test report may be submitted prior to occupancy or partial occupancy of a building or suite where phased construction is authorized. The final integrated test report is required to be submitted to the building official as a condition of final inspection.