

SEQUENCING FOR MODIFIED FIRE ALARM SYSTEMS

ONTARIO BUILDING CODE

3.2.4.3. Types of Fire Alarm Systems

- (1) A fire alarm system shall be,
 - (a) a single stage systems in a Group F, Division 1 occupancy,
 - (b) a two stage system in a Group B occupancy other than those described in Clause (c),
 - (c) a single or two stage system in a building 3 storeys or less in building height that contains a Group B, Division 3 occupancy,
 - (d) a single stage system in elementary and secondary schools, except for special needs facility, and
 - (e) a single or two stage system in all other cases.

3.2.4.4. Description of Fire Alarm Systems

- (1) A single stage fire alarm system shall, upon the operation of any manual pull station or fire detector, cause an alarm signal to sound on all audible signal devices in the system.
- (2) A two stage fire alarm system shall,
 - (a) cause an alert signal to sound upon the operation of any manual pull station or fire detector,
 - (b) except for a Group B, Division 2 occupancy, automatically cause an alarm signal to sound if the alert signal is not acknowledged within 5 min of its initiation,
 - (c) have each manual pull station equipped so that the use of a key or other similar device causes an alarm signal to sound and continue to sound upon the removal of the key or similar device from the manual pull station, and
 - (d) in a building containing a hotel,
 - I. cause an alarm signal to sound in the initiating fire zone in the hotel, and
 - II. cause an alert signal to sound throughout the hotel and such parts of the building as is necessary to alert hotel staff.

OBJECTIVE

The Building Code requires certain buildings to be constructed with a fire alarm system. Depending on the type of occupancy or building height, the fire alarm system will be a single stage or two stage system. Single stage fire alarm systems require the full evacuation of a building upon alarm. Two stage fire alarm systems require an alert signal to sound before full evacuation.

Designers have traditionally used either a signal stage or a two stage fire alarm system and modified them when the building design is a complex layout. Modified single stage and modified two stage fire alarm systems are not provided for in the Building Code, but may be used as an alternative solution under Division C – Part 2 of the Building Code. The sequencing of a modified fire alarm system must be submitted to the building department for review and approval prior to implementation.

The intent of an alert signal in a two stage fire alarm system is to provide notification to all occupants of a potential threat of fire. When modifying a single stage or a two stage fire alarm system in a complex with more than one tower, the design must include a provision to alert all occupants of the building where the alert was initiated and all floors and amenities shared with the other tower(s), such as parking levels, lobbies, etc.

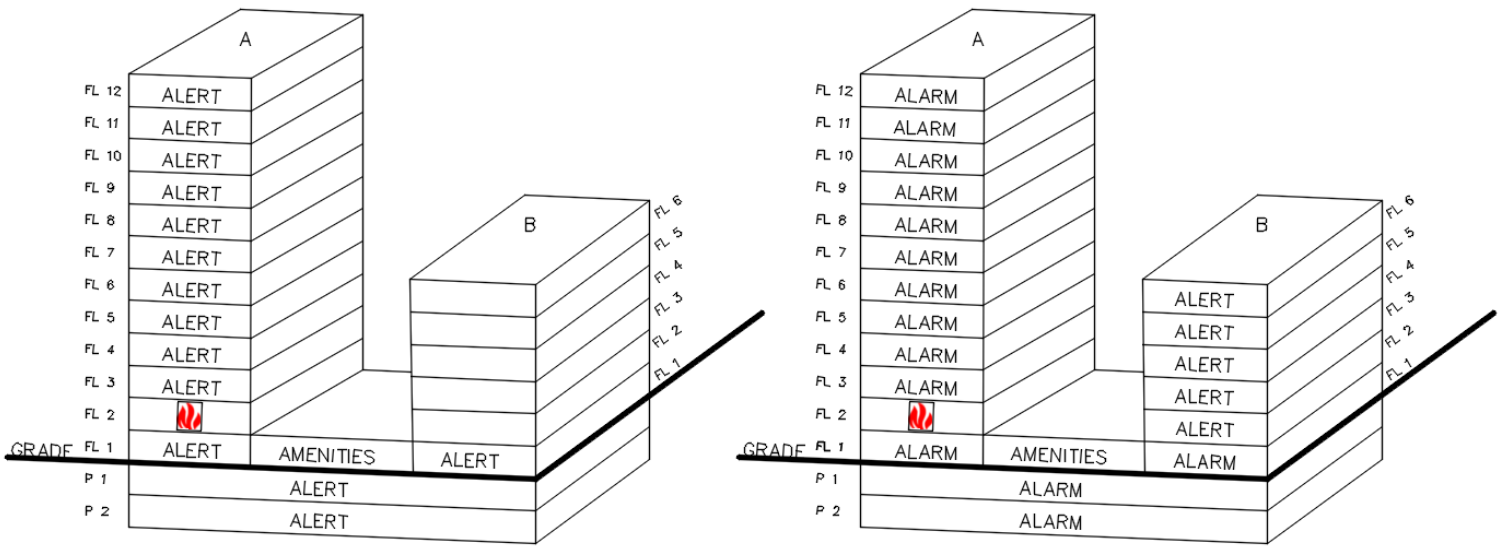
Similarly, once the alert signal becomes an alarm signal, the design must include a provision to alarm or evacuate all occupants of the building where the alarm has sounded and all common floor and amenities share with the other tower(s).

However, in addition, the occupants of all other tower(s) must be alerted of a fire condition within the complex. In a two stage system this is accomplished with an alert signal and in a single stage system this may be accomplished using a pre-programmed voice announcement. For example:

- “Attention, Attention. The fire alarm has been activated in the parking garage. The fire department has been notified. Please do not go to the parking garage.”
- “Attention, Attention. The fire alarm has been activated in a building. The fire department has been notified. Please do not go to the tower in alarm.”

The diagram and chart offers an example of how a modified two stage fire alarm system can meet the requirements and intent of the Building Code.

ONE BUILDING COMPLEX WITH TWO TOWERS A AND B, SHARED AMENITIES AND PARKING FACILITIES AND A MODIFIED 2 STAGE FIRE ALARM SYSTEM



1ST STAGE-ALERT SIGNAL

2ND STAGE-ALERT AND ALARM SIGNAL

Note: Buildings fully sprinklered
 [Fire Icon] Denotes Fire Alarm zone of initiation

FIRE ALARM ACTION	SYSTEM ACTION					
	GENERAL FUNCTIONS		SIGNALING FUNCTIONS		ELEVATOR RECALL	FAN FUNCTIONS
	Visual indication of device on fire alarm panel (CACF) and remote annunciator(s)	Start time for 2nd stage 5 min.	SOUND ALARM 2 stage	SOUND ALERT 1 stage		
Activate device in P1 to P2 1st stage	A and B	P1/P2/FL 1/ Amenities		Entire complex	Manual emergency recall shall be provided for all elevators serving storeys above the the first storey for sprinklered building	Note: 1st stage shall initiate all required fan functions
Activate device in P1 to P2 2nd stage			P1/P2/FL1/ Amenities	FL 2 and up in all towers (A/B)		
Activate device in FL 1 1st stage	A and B	Entire complex		Entire complex	Automatic emergency recall shall be provided for all elevators serving storeys above the the first storey for non sprinklered building	
Activate device in FL 1 2nd stage			Entire complex			
Activate typical floor device, FL2 and above Tower 1st stage	Entire affected tower	Entire affected tower, FL 1 and below inc. parking		Entire affected tower P1, P2, FL 1, Amenities		
Activate typical floor device, FL2 and above Tower 2nd stage			Entire affected tower P1, P2, FL 1 and Amenities	Floors in the unaffected tower(s)		
Elevator shafts 1st stage	A and B	Entire complex		Entire complex		
Elevator shafts 2nd stage			Entire complex			

Affected tower means the location of fire alarm zone of initiation
 Entire complex means towers A and B, Amenities and Parking levels
 Tower A is FL 1 to FL 12 and Tower B is FL 1 to FL 6