



Sequencing For Modified Fire Alarm Systems

The Building Standards Department issues Builder Tips as part of our customer service program. They are designed to provide an improved understanding of the Building Code and to reduce the costs associated with correcting infractions. Please contact your area building inspector for further information or call the Building Standards Department at 905.475.4848 extension 2189

3.2.4.3. Types of Fire Alarm Systems

(1) A fire alarm system shall be

- (a) a single-stage system in a Group F, Division 1 occupancy,
- (b) except as permitted in Clause (c), a 2-stage system in a Group B occupancy,
- (c) a single- or 2-stage system in a Group B, Division 3 occupancy where the building is 3 storeys or less in building height,
- (d) a single-stage system in elementary and secondary schools, except for special needs facility, and
- (e) a single- or 2-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 station, waterflow detecting device, or fire detector, cause an alarm signal to sound on all audible signal devices in the system. (See Note A-3.2.4.4.(1))

(2) A 2-stage fire alarm system shall

- (a) cause an alert signal to sound upon the operation of any manual station, waterflow detecting device 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 manual stations, each of which is equipped so that the use of a key or other similar device causes an alarm signal to sound and continues to sound upon removal of the key or similar device from the manual station, and (See Note A-3.2.4.4.(2)(c))
- (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.

(See Note A-3.2.4.4.(2))

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 2-stage system. Single-stage fire alarm systems require the full evacuation of a building upon alarm. 2-stage fire alarm systems require an alert signal to sound before full evacuation.

Designers have traditionally used either a signal-stage or a 2-stage fire alarm system and modified them when the building design is a complex layout. Modified single-stage and modified 2-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 2-stage fire alarm system is to provide notification to all occupants of a potential threat of fire. When modifying a single-stage or a 2-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).

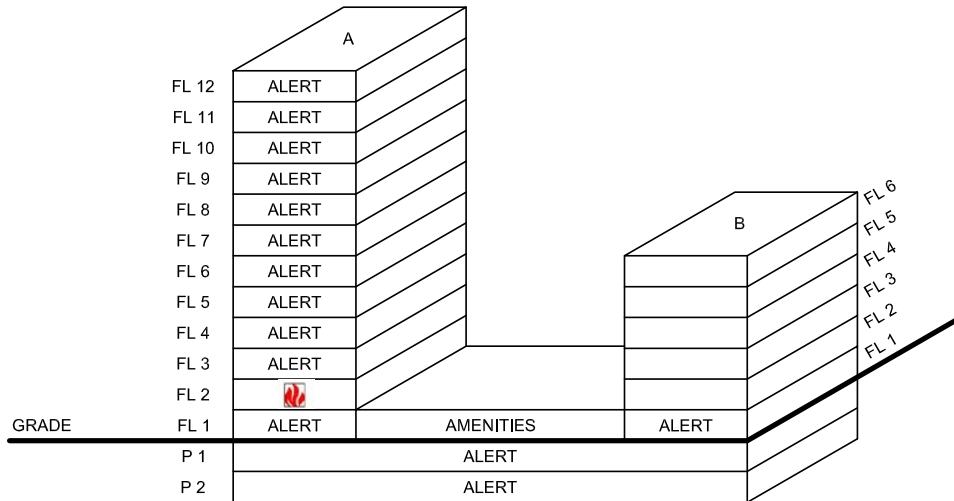
However, in addition, the occupants of all other tower(s) must be alerted of a fire condition within the complex. In a 2-stage system this is accomplished with an alert signal and in a single-stage system this may be accomplished using a pre-programmed voice announcement. For example:

- “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.”

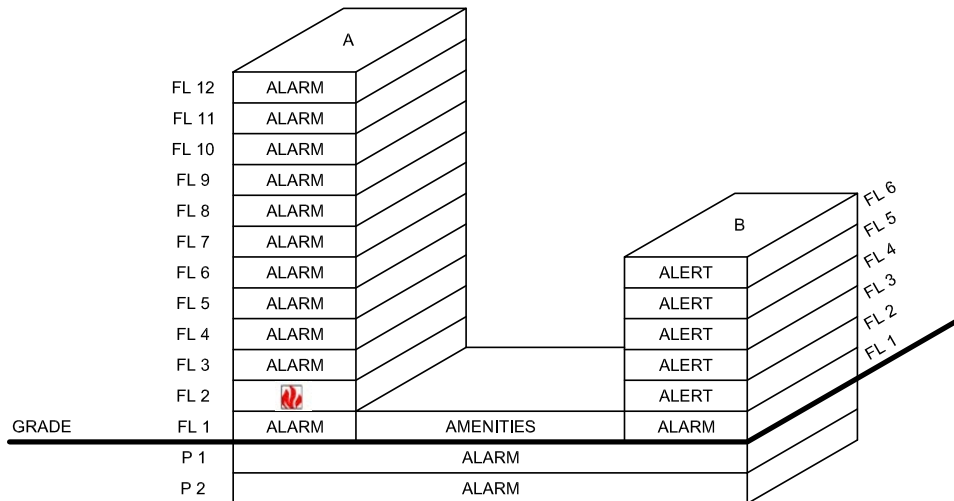


The diagram and chart offers an example of how a modified two stage fire alarm system can meet the requirements and intent of the Building Code.

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



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 2 nd stage 5 min.	SOUND ALARM 2 stage	SOUND ALARM 1 stage		
Activate device in P1 to P2 1 st stage	A and B	P1/P2/ FL1/ Amenities		Entire complex	Manual emergency recall shall be provided for all elevators serving storeys above the first storey for sprinklered building Automatic emergency recall shall be provided for all elevators serving storeys above the first storey for non sprinklered building	Note: 1 st stage shall initiate all required fan functions.
Activate device in P1 to P2 2 nd stage			P1/P2/FL1/ Amenities	FL2 and up in all Towers (A/B)		
Activate device in FL1 1 st stage	A and B	Entire complex		Entire complex		
Activate device in FL1 2 nd stage			Entire complex			
Activate typical floor device, FL2 and above Tower 1 st stage	Entire affected tower	Entire affected tower, FL1 and below inc. parking		Entire affected tower P1, P2, FL1, Amenities		
Activate typical floor device, FL2 and above Tower 2 nd stage			Entire affected tower P1, P2, FL1, Amenities	Floors in the unaffected tower(s)		
Elevator shafts 1 st stage	A and B	Entire complex		Entire complex		
Elevator shafts 2 nd stage			Entire complex			



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Affected tower means the location of fire alarm zone of initiation.

Entire complex mean 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.