

FIRE ALARM SYSTEM REQUIREMENTS

TFMO	
<p>2015 IFC:BC 105.2.5 / 2015 IBC:BC 105.7 - All required permits and work authorizations are posted (i.e. Building, EWA, HWA, PWA, Fire Alarm, Fire Protection Systems, etc.).</p>	<p>(IFC) Work requiring a permit/work authorization shall not commence until said permit/work authorization is posted in a conspicuous place on the job site and approved plans are available at this location. Where work is commenced prior to obtaining said permit/work authorization, the fees may be increased by 100% as determined by the AHJ, but payment of the increased fee shall not relieve any person from fully complying with the requirements to obtain a permit/work authorization, nor of any other penalties herein. (IBC) The reviewed building plans and building permit/work authorization or copy, shall be kept readily available, on the site of the work, always work is being performed until the completion of the project.</p>
<p>2015 IFC:BC 105.2.5 / 2015 IBC:BC 109.4 - Work commencing before permit issuance (Required permit fees are doubled for violation).</p>	<p>(IFC) Work requiring a permit/work authorization shall not commence until said permit/work authorization is posted in a conspicuous place on the job site and approved plans are available at this location. Where work is commenced prior to obtaining said permit/work authorization, the fees may be increased by 100% as determined by the AHJ, but payment of the increased fee shall not relieve any person from fully complying with the requirements to obtain a permit/work authorization, nor of any other penalties herein. (IBC) Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits or work authorizations shall be subject to a fee established by the building official that shall be in addition to the required permit fees. No work shall be started at a new construction site or an existing structure without a permit being issued or by approval to begin work by the Fire Marshal or his designee.</p>

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	<p>Both the individual contractor along with the site general contractor will be held liable for such actions. Where work is commenced prior to obtaining said permit, the permit fees shall be increased by twice the original permit fee amount, but payment of the increased fee shall not relieve any person from fully complying with the requirements to obtain a permit, nor of any other penalties herein.</p>
<p>2015 IFC:BC 105.4.7 / 2015 IBC:BC 105.7 - Reviewed and stamped set of plans are available on job site.</p>	<p>(IFC) When a permit/work authorization or approved plans are not available upon request by the Fire Marshal or the Fire Marshal's designee any further inspections shall not be scheduled or performed until the fee has been paid. (IBC) The reviewed building plans and building permit/work authorization or copy, shall be kept readily available, on the site of the work, always work is being performed until the completion of the project.</p>
<p>General / Status of System</p>	
<p>2015 IFC 901.5 - Witness of installation acceptance testing</p>	<p>In Unincorporated Bexar County, all acceptance tests must be witnessed by the BCFMO inspector. Fire detection and alarm systems, fire-extinguishing systems, fire hydrant systems, fire standpipe systems, fire pump systems, private fire service mains and all other fire protection systems and appurtenances thereto shall be subject to acceptance tests as contained in the installation standards and as approved by the fire code official. The fire code official shall be notified before any required acceptance testing.</p>
<p>2013 NFPA 72 10.4.4 - Areas that are not continuously occupied, properly protected</p>	<p>In areas that are not continuously occupied, automatic smoke detection shall be provided at the location of each fire alarm control unit(s), notification appliance circuit power extenders, and supervising station transmitting equipment to provide notification of fire at that location.</p>

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2013 NFPA 72 23.8.5.1.2 - Fire alarm box provided for initiating devices	Where connected to a supervising station, fire alarm systems employing automatic fire detectors or waterflow detection devices shall include a manual fire alarm box to initiate a signal to the supervising station.
2013 NFPA 72 14.2.4.1 - Notification prior to testing	Before proceeding with any testing, all persons and facilities receiving alarm, supervisory, or trouble signals and all building occupants, shall be notified of the testing to prevent unnecessary response.
2013 NFPA 72 10.3.1 - Equipment, listed for the purpose for which it is used	Equipment constructed and installed in conformity with this Code shall be listed for the purpose for which it is used.
Control Panel	
2013 NFPA 72 10.3.2 - Fire alarm system components installed, tested, and maintained	Fire Alarm system components shall be installed, tested, and maintained in accordance with the manufacturer's published instructions and this Code.
2013 NFPA 72 10.4.1 - Systems shall be installed in accordance with the authority having jurisdiction	All systems shall be installed in accordance with the specifications and standards approved by the authority having jurisdiction.
2013 NFPA 72 10.6.5.2.2 - System circuit disconnecting, permanently identified	System circuit disconnecting means shall be permanently identified as to its purpose in accordance with the following: FIRE ALARM for fire alarm systems EMERGENCY COMMUNICATIONS for emergency communications systems FIRE ALARM/ECS for combination fire alarm and emergency communications systems
2013 NFPA 72 10.6.5.2.3 - Circuit disconnecting, marked in red	For fire alarm and/or signaling systems, the circuit disconnecting means shall have a red marking.
2013 NFPA 72 24.5.2.5.5.2 - Secondary power source	The secondary power source shall consist of one of the following: (1) A storage battery dedicated to the system with at least 12 hours of 100 percent system operation capacity and

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	arranged in accordance with 10.6.10. (2) An automatic-starting, engine-driven generator serving the dedicated branch circuit or the system with at least 12 hours of 100 percent system operation capacity and storage batteries dedicated to the system with at least 2 hours of 100 percent system operation capacity and arranged in accordance with 10.6.11.3.
2013 NFPA 72 10.6.10.1.1 - Batteries marked with month and year	Batteries shall be marked with the month and year of manufacture using the month/year format.
2013 NFPA 72 - 10.6.10.1.2 - Obtain date code, properly mark batteries	Where the battery is not marked with the month/year by the manufacturer, the installer shall obtain the date code and mark the battery with the month/year of battery manufacture.
2013 NFPA 72 12.2.5.1 - Ground connections	All fire alarm systems shall test free of grounds. Exception: Parts of circuits or equipment that are intentionally and permanently grounded to provide ground-fault detection, noise suppression, emergency ground signaling, and circuit protection grounding shall be permitted.
2013 NFPA 72 10.18.1.1.1 - Visible notification of initiating device	Visible annunciation of the location of an operated initiating device shall be by an indicator lamp, alphanumeric display, printout, or other approved means.
2013 NFPA 72 10.18.1.1.2 - Visible notification of initiating device (canceled)	The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances.
Manual Stations	
2015 IFC:BC 907.4.2.1 - Located within 5 feet of exterior exit(s)	Manual fire alarm boxes shall be located not more than 5 feet from the entrance to each exit. In buildings not protected by an automatic sprinkler system, additional manual fire alarm boxes shall be so located that exit access travel distance to the nearest box does not exceed 200 feet. Exception: Where construction of the

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	building prohibits the proper installation of a pull station (e.g., glass walls) a pull station shall be allowed to be in the normal path of egress travel.
2015 IFC 907.4.2.6 / 2013 NFPA 72 17.14.8.2 - Manual fire alarm boxes (pull stations) shall be unobstructed and unobscured.	Manual fire alarm boxes shall be accessible, unobstructed, unobscured and visible, always. This section addresses the concern that manual fire alarm boxes be kept clear and unobstructed. It is recommended that a minimum of 3 feet be kept clear, but more may be needed. NFPA 72 addresses the need for manual fire alarm boxes to be unobstructed in Section 17.14.8.2 and states that manual fire alarm boxes be conspicuous, unobstructed and accessible. This requirement will assist during the design, construction, inspection and future maintenance of manual fire alarm boxes when they are located where they will be provided with enough space to access and will not be obstructed.
2015 IFC 907.4.2.2 - Height (42 - 48 inches)	The height of the manual fire alarm boxes shall be not less than 42 inches and not more than 48 inches measured vertically, from the floor level to the activating handle or lever of the box.
2013 NFPA 72 17.14.3 - Manually actuated alarm-initiating devices, securely mounted	Manually actuated alarm-initiating devices shall be securely mounted.
Area Smoke Detectors	
2013 NFPA 72 29.8.1.2 - Devices protected from jarring or vibration	All devices shall be so located and mounted that accidental operation is not caused by jarring or vibration.
2013 NFPA 72 17.6.3.1.3.1 - Location of spot-type detectors	Unless otherwise modified by 17.6.3.2.2, 17.6.3.3.2, or 17.6.3.7, spot-type heat-sensing fire detectors shall be located on the ceiling not less than 4 inches from the sidewall or on the sidewalls between 4 inches and 12 inches from the ceiling.

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<p>2013 NFPA 72 17.7.3.2.3.1 - Smoke detector spacing / requirements in the absence of specific performance-based design criteria</p>	<p>In the absence of specific performance-based design criteria, one of the following requirements shall apply: (1) The distance between smoke detectors shall not exceed a nominal spacing of 30 feet and there, shall be detectors within one-half the nominal spacing, measured at right angles from all walls or partitions extending upward to within the top 15 percent of the ceiling height. (2) All points on the ceiling shall have a detector within a distance equal to or less than 0.7 times the nominal 30 feet spacing.</p>
<p>2013 NFPA 72 17.7.4.1 - Spaces served by air-handling systems</p>	<p>In spaces served by air-handling systems, detectors shall not be located where airflow prevents operation of the detectors.</p>
Installation	
<p>2013 NFPA 72 12.2.4.3 - Fire alarm system wiring, and equipment installed properly</p>	<p>Fire alarm system wiring and equipment, including all circuits controlled and powered by the fire alarm system, shall be installed in accordance with the requirements of this Code and of NFPA 70, National Electrical Code, and Article 760.</p>
<p>2013 NFPA 72 12.2.4 - Pathway wiring installed properly</p>	<p>The installation of all pathway wiring, cable, and equipment shall be in accordance with NFPA 70, National Electrical Code, and the applicable requirements of 12.2.4.1 through 12.2.4.4.</p>
Duct Smoke Detectors	
<p>2015 IFC:BC 907.3.1 - Duct smoke detectors</p>	<p>Smoke detectors installed in ducts shall be listed for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit when a fire alarm system is required by Section 907.2. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location and shall perform the intended fire safety function in accordance with this code and the International Mechanical</p>

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	<p>Code. Duct smoke detectors shall not be used as a substitute for required open area detection. Exceptions: 1. The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the building's alarm notification appliances. 2. In occupancies not required to be equipped with a fire alarm system, actuation of a duct smoke detector shall activate a visible and an audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble. Where a duct smoke detector is installed, there shall also be installed a remote test switch that includes a visual signal, audible signal, and a key operated test/reset switch.</p>
2013 NFPA 72 17.4.7 - Concealed locations, provided with remote alarm or supervisory	<p>Where smoke detectors are installed in concealed locations more than 10 feet above the finished floor or in arrangements where the detector's alarm or supervisory indicator is not visible to responding personnel, the detectors shall be provided with remote alarm or supervisory indication in a location acceptable to the authority having jurisdiction.</p>
2013 NFPA 72 17.7.5.4.2.1 - Supply air system, required smoke detector	<p>Where the detection of smoke in the supply air system is required by other NFPA standards, a detector listed for the air velocity present and that is to be located in the supply air duct downstream of both the fan and the filters shall be installed.</p>
2013 NFPA 72 17.7.5.4.2.2 - Return air supply, required smoke detector	<p>Unless otherwise modified by 17.7.5.4.2.2(A) or 17.7.5.4.2.2(B), if the detection of smoke in the return air system is required by other NFPA standards, a detector listed for the air velocity present shall be located where the air leaves each smoke compartment, or in the duct system before the air enters the return air system common to more than one smoke compartment.</p> <p>(A) Additional smoke detectors shall not be required to be installed in ducts where the air</p>

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	<p>duct system passes through other smoke compartments not served by the duct.</p> <p>(B) Where total coverage smoke detection is installed in accordance with 17.5.3.1 in all areas of the smoke compartment served by the return air system, installation of additional detector listed for the air velocity present where the air leaves each smoke compartment, or in the duct system before the air enters in the return air system shall not be required, provided that their function is accomplished by the design of the total coverage smoke detection system.</p>
Audible	
2013 NFPA 72 18.4.8.1 - Ceiling heights (appliance location)	If ceiling heights allow, and unless otherwise permitted by 18.4.8.2 through 18.4.8.5, wall-mounted appliances shall have their tops above the finished floors at heights of not less than 90 inches and below the finished ceilings at distances of not less than 6 inches.
2013 NFPA 72 24.3.1 - Intelligible voice messages (Voice Evac systems)	Emergency communications systems shall be capable of the reproduction of prerecorded, synthesized, or live (e.g., microphone, telephone handset, and radio) messages with voice intelligibility in accordance with Chapter 18.
2013 NFPA 72 A.18.4.3.1 - Audio levels / sound system shunts.	A shunt trip is required in occupancies to reduce or eliminate the background noise from sound systems and other entertainment systems that may have audio that is louder than the fire alarm. Since NFPA 72 requires that the fire alarm produce a minimum decibel level that is at least 15 db above average ambient sound or 5 db above maximum sound level, an audio shunt is required to reduce/eliminate the ambient sound produced by sound systems and other entertainment systems so that the fire alarm can be heard without interference by these systems.

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Strobes	
2013 NFPA 72 18.5.5.1 - Wall mounted devices (height)	Wall-mounted appliances shall be mounted such that the entire lens is not less than 80 inches and not greater than 96 inches above the finished floor or at the mounting height specified using the performance-based alternative of 18.5.5.6.
2013 NFPA 72 18.5.5.4.1 - Spacing of devices (rooms)	Spacing shall be in accordance with either Table 18.5.5.4.1(a) and Figure 18.5.5.4.1 or Table 18.5.5.4.1(b). Table 18.5.5.4.1(a) Room Spacing for Wall-Mounted Visible Appliances Table 18.5.5.4.1(b) Room Spacing for Ceiling-Mounted Visible Appliances
2013 NFPA 72 18.5.5.5.5 - Spacing of devices (corridors)	Visible notification appliances shall be located not more than 15 feet from the end of the corridor with a separation not greater than 100 feet between appliances.
2013 NFPA 72 18.5.5.4.2 - Visual devices (strobes) synchronized	Visible notification appliances shall be installed in accordance with Table 18.5.5.4.1(a) or Table 18.5.5.4.1(b) using one of the following: (1) A single visible notification appliance. (2) Two groups of visible notification appliances, where visual appliances of each group are synchronized, in the same room or adjacent space within the field of view. This shall include synchronization of strobes operated by separate systems. (3) More than two visible notification appliances or groups of synchronized appliances in the same room or adjacent space within the field of view that flash in synchronization.
2013 NFPA 72 18.5.5.7.3 - Sleeping areas within 16 feet of the pillow	For rooms with a linear dimension greater than 16 feet, the visible notification appliance shall be located within 16 feet of the pillow.
Monitoring	
2013 NFPA 72 24.5.2.5.5.2 - Secondary power source	The secondary power source shall consist of one of the following: (1) A storage battery

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	<p>dedicated to the system with at least 12 hours of 100 percent system operation capacity and arranged in accordance with 10.6.10. (2) An automatic-starting, engine-driven generator serving the dedicated branch circuit or the system with at least 12 hours of 100 percent system operation capacity and storage batteries dedicated to the system with at least 2 hours of 100 percent system operation capacity and arranged in accordance with 10.6.11.3</p>
<p>2013 NFPA 72 26.3.6.6 - Two independent means to retransmit.</p>	<p>Two independent means shall be provided to retransmit an alarm signal to the designated communications center.</p>
<p>2015 IFC 903.4.1 - Monitoring provided</p>	<p>Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved supervising station or, where approved by the fire code official, shall sound an audible signal at a constantly attended location.</p>
<p>2013 NFPA 72 26.6.3.3.2.2 - Verification of alarm monitoring / maximum operating time.</p>	<p>Alarm monitoring and notification should be verified by placing the system in LIVE status and notifying Fire Alarm Dispatch that a test is being performed. An alarm initiating device shall be activated and Bexar County Fire Alarm dispatch should receive the notification from the alarm monitoring company within 210 seconds (3 1/2 minutes) of activation. If the time exceeds this by greater than 15 seconds, the inspection will fail unless the installer can fix it on site and perform the test again.</p>
<p>Tagging & Paperwork</p>	
<p>SFMO 34.620 - Installation Label-White</p>	<p>If tag is current, this item should be marked No Violation. If tag is expired or a red or yellow tag is present, this item should be marked Violation. (a) After the completion of an installation of new fire alarm equipment or a new system, or the extension, alteration, or modification to a fire alarm system already in place, an installation label must be affixed to</p>

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	<p>the inside of the control panel cover or, if the system has no panel, in a permanent location. Yellow or red labels must not be attached for the installation of a new system or new equipment used in the extension, alteration, or modification to an existing fire alarm system. (b) Installation labels must be white with black lettering. (c) Installation labels must be approximately three inches in height and approximately three inches in width and must have an adhesive on the back. (d) Installation labels must contain the following information in the format of the label as indicated in subsection (e) of this section: (1) DO NOT REMOVE BY ORDER OF TEXAS STATE FIRE MARSHAL (all capital letters in at least 10-point bold face type); (2) INSTALLATION RECORD (all capital letters in at least 10-point bold face type); (3) the registered firm's name, address, and telephone number and the certificate of registration number (either main office or branch office) of the firm performing the installation; (4) the installation date, the licensee's signature (a stamped signature is prohibited) and license number; and (5) the name and license number of the fire alarm planning superintendent or residential fire alarm planning superintendent (as applicable) or professional engineer's name and license number who planned the system.</p>
<p>SFMO 34.622 - State inspection tag on system is current and signed by licensed installer.</p>	<p>If tag is current, this item should be marked No Violation. If tag is expired or a red or yellow tag is present, this item should be marked Violation. (a) After the inspection and testing of a fire alarm system, a fire alarm inspection/test label must be completed in detail and affixed to either the inside or outside of the control panel cover or, if the system has no panel, in a permanent location. The signature of the licensee on the inspection/test label certifies that the inspection and tests performed complies with requirements of the adopted standards. (b) If any service or maintenance is</p>

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performed pursuant to the inspection or test, a service label, in addition to the inspection/test label, shall be completed and attached according to the procedures in this section. (c) If during any inspection or test it is observed that the system does not comply with applicable standards adopted at the time the system was installed, has a fault condition, or is impaired from normal operation, the owner or the owner's representative and the local authority having jurisdiction must be notified of the condition and the licensee must attach, in addition to the inspection/test label, the appropriate yellow or red label, in accordance with the procedures in this section. (d) Inspection/test labels shall remain in place for at least five years, after which time they may be removed by a licensed employee or agent of a registered firm. An employee of the State Fire Marshal's Office or an authorized representative of a governmental agency with appropriate regulatory authority may remove excess labels at any time. (e) The inspection/test label must be blue in color with printed black lettering. (f) The inspection/test label must be approximately three inches in height and three inches in width and must have an adhesive on the back that allows for label removal. (g) Approximately 1/2 inch of the adhesive on the top back of the label should be used to attach the label.