

CHAPTER 16.40
FIRE ALARM SYSTEMS

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16.40.010 Required

An automatic fire alarm system shall be installed in all new structures. Exceptions are noted in TMC Section 16.40.140.

(Ord. 2437 §2, 2014)

16.40.020 References

The following references shall be used in the design, installation and maintenance of fire alarm systems within the City of Tukwila; if there is a conflict between the codes, the code that provides the greatest degree of fire protection shall apply. References are to the current editions, unless otherwise noted.

- NFPA 70..... National Electrical Code
- NFPA 72..... Protective Signaling Systems
- NFPA 88a..... Parking Structures
- IFC International Fire Code
- IBC International Building Code
- WAC 51-34..... Washington Fire Code
- RCW 19.27..... State Building Code Act
- RCW 19.28..... Electrical Code and Ordinances

(Ord. 2437 §3, 2014)

16.40.030 Definitions

A. **“Addressable device”** means a fire alarm system component with discreet identification that can have its status individually identified or that is used to individually control other functions.

B. **“Alarm indicating device”** is any listed bell, buzzer, visual or audible device that produces an alarm signal for fire.

C. **“Alarm initiating device”** is any listed device which, when activated, initiates an alarm by manual or automatic operation of an electrical contact through an alarm indicating device.

D. **“Alarm signal”** is any listed audible or visual signal, or both, indicating the existence of an emergency fire condition.

E. **“Analog initiating device”** (sensor) is an initiating device that transmits a signal indicating varying degrees of condition, as contrasted with a conventional initiating device that can only indicate an on/off condition.

F. **“Annunciator”** is any listed equipment that indicates the zone or area of the building from which an alarm has been initiated, the location of an alarm actuating device, or the operation condition of alarm circuits or the system.

G. **“Approved”** refers to the approval of the Tukwila Fire Department.

H. **“Authority having jurisdiction”** refers to the Tukwila Fire Department.

I. **“Automatic fire alarm system”** is a combination of listed compatible devices, control panels, audible and visual devices and other equipment, together with the necessary electrical energy, designed and wired to produce an alarm in the event of fire or special system activation.

J. **“Alarm/control panel”** is comprised of the controls, relays, switches and associated circuits necessary to furnish power to a fire alarm system, receive signals from fire alarm devices and transmit them to indicating devices and accessory equipment.

K. **“Compatibility listed”** means a specific listing process that applies only to two-wire devices (such as smoke detectors) designed to operate with certain control equipment.

L. **“Compatible”** means equipment that interfaces mechanically or electrically together as manufactured, without field modification.

M. **“Fire alarm control panel”** is a system component that receives input from automatic and manual fire alarm devices and may supply power to detection devices and transponder(s) or off-premises transmitter(s). The control unit may also provide transfer of power to the notification appliances and transfer of condition to relays or devices connected to the control unit. The fire alarm control unit can be a local fire alarm control unit or master control unit.

N. **“Listed”** means equipment or materials indicated in a list published by an organization acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials, and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

O. **“Line-type detector”** is a device in which detection is continuous along a path. Typical examples are rate-of-rise pneumatic tubing detectors, projected beam smoke detectors, and heat-sensitive detectors.

P. **“Maintenance”** refers to repair service, including periodic recurrent inspections and tests per manufacturer’s specifications and NFPA 72, required to keep the protective signaling system (automatic fire alarm system) and its component parts in an operative condition at all times, together with the replacement of the system or its components when—for any reason—they become undependable or inoperative.

Q. **“Shall”** indicates a mandatory requirement.

R. **“Should”** indicates a recommendation or that which is advised but not required.

S. **“Spacing”** means a horizontally measured dimension relating to the allowable coverage of fire detectors.

T. **“Transmitter”** refers to any listed transmitter able to transmit and/or receive status changes automatically or manually from a listed alarm panel to an approved central station via approved method.

U. **“UL central station”** refers to a UL-listed central station approved to monitor automatic fire alarm systems with the City of Tukwila.

V. **“Zone”** means each building or portion of building, as determined by the authority having jurisdiction.

W. **“Resubmittal”** means any set of plans that requires subsequent review.

(Ord. 2437 §4, 2014)

16.40.040 Approval and Design Plans

A. At least three complete sets of construction drawings with information regarding the fire alarm system, including detailed specifications, wiring, diagrams, elevation diagram (showing false ceiling areas), and floor plans, shall be submitted to the Tukwila Fire Marshal for approval prior to installation of any equipment or wiring. (One set of approved plans shall be located at the construction site.)

B. Drawings submitted for approval must include the following:

1. A completed Fire Protection System Permit Application.
2. Floor layout showing all rooms and spaces, including a cross section of the space being protected, with accurate measurements drawn to a scale no smaller than 1/8-inch scale.
3. Identification of each room or space, i.e. guest rooms, mechanical room, attic, etc.
4. Location of each system component using the appropriate symbol.
5. Explanatory notes and legend to lend clarity to the plan and identify the manufacturer and model number of each alarm component used.
6. A wiring schematic clarifying type and size of wiring (must comply with NFPA 70), and a point-to-point wiring diagram.
7. Zoning, if applicable.
8. A copy of the technical specifications for each component used in the makeup of the automatic fire alarm

system. If the components are not all from the same manufacturer, UL cross listing compatibility cards are required.

9. The current used by each of the initiating and indication devices and current rating of the power supply.

10. Battery and voltage drop calculations for compatibility.

11. Building permit number.

12. Total number of devices being installed.

C. After the fire alarm plans have been approved by the Tukwila Fire Marshal, a job number will be issued to begin work. The plan review fees shall be in accordance with the Fire Department Fee Schedule adopted by resolution of the City Council.

(Ord. 2505 §1, 2016; Ord. 2437 §5, 2014)

16.40.050 General Requirements

A. All companies installing automatic fire alarm systems shall have a State electrical contractor’s license.

B. All persons installing automatic fire alarm systems shall hold a State low voltage installer’s certificate or journeyman electrician certificate per RCW 19.28.041. An apprentice certificate is acceptable for installers when supervised by a certified journeyman per RCW 19.28.4.

C. A City of Tukwila electrical permit shall be posted at all automatic fire alarm system installations per TMC Section 16.04.020.

D. All equipment, devices, and wiring shall be listed by Underwriters Laboratories or Factory Mutual and shall be approved for the purpose for which they are intended. No one shall perform any type of modification to any device that would void its UL/FM listing.

E. If determined necessary by the authority having jurisdiction, control panels shall have sufficient auxiliary power outlets for automatic door closures, relay boards for elevator control, HVAC detectors, air pressurization, and all other auxiliary devices. They shall also have sufficient power for four-wire smoke detectors, remote LED indicating lights and duct detectors with relays.

F. Remote alarm annunciation/indication is required at the main entrance if the control panel is not visible from the main entrance. The height of the annunciator/control panel shall be 48 to 60 inches above grade/floor.

G. When the control panel is located inside a room, the outside of the door shall have a sign in one-inch letters that reads “Fire Alarm” or “Fire Alarm Control.”

H. A rechargeable battery backup is required on any automatic fire alarm system installation. There shall be enough battery capacity at all times to run the alarm system in standby for 24 hours and, after that time, sound all alerting devices for at least five minutes. A 15% safety factor shall be provided in all voltage drop calculations. At the end of the battery life cycle, batteries shall be replaced.

I. Audible devices shall be placed in buildings and be so located that, with all intervening doors closed, the alarm device shall be heard at not less than 15 decibels above the ambient noise levels; sleeping areas shall be a minimum of 75 decibels. Visible alarms shall be placed throughout the building in all assembly areas; common use areas, including toilet rooms and bathing facilities; hallways and lobbies; hotel guest rooms and rooms 130 square feet or larger regardless of use.

J. Whenever possible, the control panel shall be located in a heated main corridor or a heated main lobby. When the control panel is located inside a room, the room shall be heated, and kept at an ambient temperature between 40° and 100°F. **AT NO TIME SHALL THE CONTROL PANEL BE LOCATED IN AN EXTERIOR LOCATION.**

K. All new alarm systems shall be addressable. Each device shall have its own address and shall annunciate individual addresses at a UL central station.

L. When requested by the Fire Marshal, the owner of a building equipped with a fire alarm system shall provide as-built fire alarm drawings to ensure adequate fire alarm system power is available.

(Ord. 2437 §6, 2014)

16.40.060 Alarm/Control Panel Requirements

A. A light shall indicate that the system is receiving normal power. A failure of normal power shall cause the light to go out and an audible signal to sound.

B. All batteries shall have an automatic rate charger to maintain standby batteries in a fully charged condition.

C. A power transfer circuit shall be installed that will switch to standby power automatically and instantaneously if normal power fails.

D. All alarm signals shall be automatically “locked in” at the alarm panel until their operated devices are returned to normal condition, and the alarm panel is manually reset.

E. The fire alarm panel shall be reset only by authorized personnel of the Tukwila Fire Department.

F. The reset code for the fire alarm panel or keypad shall be 1-2-3-4-5. The reset code shall not be changed without the approval of the Fire Marshal. The reset code should be permanently posted at the keypad.

G. The supervised relay boards that control elevator recall, air pressurization and all other auxiliary functions shall stay “locked in,” even though the audible signaling circuits have been silenced, until the panel has been reset and returned to normal.

H. For systems employing water flow detection devices, manual pull stations shall be distributed throughout the building. Audible and visible alarms shall be placed in all common-use areas.

I. All trouble and supervisory indication for Post Indicating Valves, Wall Indicating Valves, and Outside Stem and Yoke Valves shall be addressed as individual address points, for trouble/supervisory only.

(Ord. 2437 §7, 2014)

16.40.070 Placement and Type of Detector

A. All detectors shall be installed and spaced according to the manufacturer’s instructions and NFPA 72. The Tukwila Fire Marshal may require additional detectors or decreased spacing.

B. At least one of the following types of detectors shall be placed in all rooms, halls, storage areas, basements, attics, lofts, spaces above suspended ceilings, storage lockers, closets, electrical rooms, machine equipment rooms, shafts, crawl spaces and stairwells: smoke, rate-of-rise, fixed-temperature, photobeam, flame, rate-compensation, or line-type. Access shall be provided to the attics and crawl spaces for maintenance of the detectors.

C. All detectors placed above the ceiling shall have remote indicating lights in the ceiling directly below the device or other means of indication as approved by the Tukwila Fire Marshal.

D. All rate-of-rise and fixed-temperature heat detectors shall have replacement links or be self-restoring for testing purposes.

E. Smoke detectors shall be the preferred detector type in all areas. When conditions are such that smoke detectors are not practical, other type(s) of detectors shall be installed as approved by the Tukwila Fire Marshal.

F. Non-sprinklered multi-family dwelling units that exit through a common interior exit corridor shall have a system heat detector installed within 25 feet of the interior exit door from the unit.

(Ord. 2437 §8, 2014)

16.40.080 Acceptance Testing

A. Upon completion of a system installation, a satisfactory test of the entire installation shall be made by the contractor’s representative in the presence of a member of the Tukwila Fire Marshal’s Office and shall comply with the procedures contained in NFPA 72 and the manufacturer’s specifications. The use of a decibel meter will be employed to determine minimum sound levels during acceptance testing. Final approval is contingent upon a successful performance test.

B. A condition of final acceptance of the fire alarm system shall be the receipt of a completed contractor’s Material and Test Certificate—Fire Alarm and Automatic Detection Systems, to the effect that the system has been installed in accordance with approved plans and tested in accordance with the manufacturer’s specifications and appropriate NFPA requirements. The completed installation certificate shall be returned to the Tukwila Fire Marshal, prior to the acceptance test.

C. As-builts shall be provided prior to system acceptance and final approval if any modifications not shown on the original plans have been done to the system.

(Ord. 2505 §2, 2016; Ord. 2437 §9, 2014)

16.40.090 Maintenance

A. A satisfactory contract covering the maintenance, operation and efficiency of the system shall be provided by the building/property owner or his agent. The contract shall provide for inspections, tests and maintenance as specified in NFPA 72 and manufacturer’s instructions. The building/property owner or his agent shall be responsible for the maintenance of the automatic fire alarm system with the following provisions:

1. The renter or lessee shall notify the building/property owner or his agent of the need of any suspected maintenance or malfunction of the system.

2. The building/property owner or his agent shall assume no liability in the event any unauthorized person, renter or lessee tampers with, attempts to repair or damages any part of the automatic fire alarm system so as to render it inoperative. Provided, however, the building/property owner and his agent shall be liable in the event either of them become aware of tampering or efforts to repair or damage the system, and they thereafter fail to restore the system within a reasonable period of time so that it functions in accord with the standards provided for in TMC Chapter 16.40.

B. A copy of inspection, test, and maintenance records shall be forwarded to the Tukwila Fire Marshal.

C. The automatic fire alarm system shall be maintained in operative condition at all times.

D. Battery-powered detectors in existing buildings shall have new batteries installed in accordance with the manufacturer’s specifications, and shall be tested at least annually by the building owner or the building owner’s representative. Documentation of the testing and applicable repairs shall be sent to the fire department.

E. Inspections, maintenance and testing of fire alarm systems shall be performed by personnel with qualifications acceptable to the Tukwila Fire Marshal.

F. If attic heat detectors are activated by excessive heat buildup during hot weather, additional attic ventilation shall be installed in the attic to correct the heat build-up condition in compliance with the International Building Code.

(Ord. 2437 §10, 2014)

16.40.100 Applicability

A. Automatic fire alarm systems shall be installed in the following occupancies:

1. Hotels.
2. Motels.
3. Multi-family dwellings (with more than 4 units): See TMC Section 16.40.120.B, “Special Requirements.”

4. All other new commercial/industrial buildings under 500 square feet unless fully protected by an automatic sprinkler system.

5. When sold, existing commercial and industrial buildings that are not protected by an automatic sprinkler system.

Exceptions:

a. Any structure 400 square feet or less in total usable floor area.

b. Single-family residential structures.

6. When sold, existing commercial/industrial buildings equipped with an existing fire alarm system shall upgrade to current fire alarm ordinance requirements.

7. When sold, commercial/industrial buildings that are protected by an automatic sprinkler system shall install a manual fire alarm system.

8. When sold, existing hotel/motel occupancies that are not protected by an automatic sprinkler system shall install a fire alarm system throughout. The guest rooms shall comply with TMC Section 16.40.120.A.

9. When sold, multi-family dwellings that are protected by an automatic sprinkler system shall install a fire alarm system complying with TMC Section 16.40.120.B.

Exception: Multi-family dwellings of four units or less.

10. When sold, multi-family dwellings that are not protected by an automatic sprinkler system shall install smoke detectors in sleeping areas, in accordance with the International Building Code. Common areas and exit corridors shall be protected by detectors and manual pull stations monitored by a UL central station. Audibility shall meet the requirements of NFPA 72.

Exception: Multi-family dwellings of four units or less.

11. Any building or portion of a building which, due to the nature of its occupancy, is required by the International Fire Code or other nationally-recognized standard to have an automatic fire alarm system.

12. Any building or portion of a building which, due to the nature of its occupancy, is determined by the Fire Marshal to be a special hazard or have a high life safety need.

13. A manual fire alarm system shall be installed in all new sprinklered buildings. Visual and audible devices shall be installed per TMC Section 16.40.050.I.

B. For items 5, 6, 7, 8, 9 and 10 of TMC Section 16.40.100, the installation of an automatic fire alarm system shall be completed within 120 days from the date of notification by the Tukwila Fire Department.

(Ord. 2505 §3, 2016; Ord. 2437 §11, 2014)

16.40.110 Monitoring

The following fire alarm systems are required to be monitored by a City of Tukwila-approved UL central station.

1. All new automatic and manual systems as required by TMC Section 16.40.100, or required by any other code or standard.

2. All existing fire alarm systems.

3. All fire alarm systems installed by the occupant/owner that are optional in commercial, industrial and multi-family occupancies.

4. Smoke detectors that are installed in lieu of a one-hour corridor requirement.

5. HVAC units that are required to have duct detectors and that serve more than one occupancy or serve an area open to the public.

6. City of Tukwila-approved UL central stations that fail to maintain their UL listing shall be prohibited from monitoring fire alarm systems within the City of Tukwila.

(Ord. 2437 §12, 2014)

16.40.120 Special Requirements

A. The guest room smoke detectors and bathroom heat detectors of hotel/motel occupancies shall announce at a panel located at or near the front desk. These detectors will not transmit an alarm to the UL central station. The alarm panel, located at or near the front desk, shall be monitored 24 hours a day by the hotel/motel staff.

B. Multi-family dwellings and lodging houses fully protected by an automatic sprinkler system shall have detectors installed in accordance with the International Building Code. Common areas and exit corridors shall be protected by detectors and manual pull stations, monitored by a UL central station.

C. Multi-family dwellings and lodging houses shall have audible/visual devices throughout the unit. Bedrooms shall have a 110 candela wall-mounted horn/strobe within 16 feet of the pillow or a 177 candela ceiling-mounted horn/strobe. Audibility shall be a minimum of 75 decibels at the pillow. The bathroom shall have an appropriately rated strobe only.

D. When monitoring of an existing system is lost for any reason, a fire watch must be posted during non-business hours. The fire watch person shall call the recorded fire prevention phone line at two-hour intervals confirming the all-clear status of the building. In the event of a fire emergency the fire watch shall call 911 immediately to report the fire emergency.

E. Duct detectors shall send a supervisory signal only and shall not cause an alarm.

F. Approved Knox key boxes shall be provided for access to alarm panels and sprinkler risers.

G. An exterior horn or bell/strobe shall be installed outside all buildings/tenant spaces that have a fire alarm system.

H. A 110 candela horn/strobe shall be installed above the kitchen suppression system's manual pull station.

(Ord. 2437 §13, 2014)

16.40.130 Re-inspection Fees for New Construction, Tenant Improvements, and Spot Inspections

When an inspection is requested for new construction, tenant improvements or spot inspections and then, upon arrival, the Fire Inspector finds that the work is not complete, not ready for inspection, or does not comply with fire code requirements, a follow-up inspection will be required, and a re-inspection fee in accordance with the Fire Department Fee Schedule adopted by resolution of the City Council will be assessed.

(Ord. 2505 §4, 2016; Ord. 2437 §14, 2014)

16.40.140 Exceptions

Any exception to the items covered by TMC Chapter 16.40 shall be made by the Fire Marshal. Request for exception must be made in writing; exceptions granted or denied shall be in writing.

(Ord. 2505 §5, 2016; Ord. 2437 §15, 2014)

16.40.150 Penalties

Any person violating the provisions of TMC Chapter 16.40, the International Fire Code or appendices adopted by TMC Chapter 16.16, or who shall fail to comply therewith, or who shall violate or fail to comply with any order made thereunder, or who shall build in violation of any detailed statement of specifications or plans submitted and approved thereunder or any certificate or permit issued thereunder and from which no appeal has been taken, or who shall fail to comply with such an order as affirmed or modified by the Fire Marshal or by a court of competent jurisdiction within the time fixed therein, shall be guilty of a gross misdemeanor, and upon conviction thereof, shall be punished by a fine in an amount not to exceed \$5,000.00, as outlined in TMC Section 16.16.080, or imprisonment for a term not to exceed one year or by both such fine and imprisonment. The imposition of one penalty for any violation shall not excuse the violation or permit it to continue. Each day or portion thereof during which any violation of the provisions of this section is caused, permitted or continued shall constitute a separate offense and shall be punishable as such. Application of the penalty specified in this section shall not be held to prevent the enforced removal of prohibited conditions.

(Ord. 2437 §16, 2014)

16.40.160 Permit Expiration

Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. The Fire Marshal is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

(Ord. 2437 §17, 2014)

16.40.170 Appeals

A. Whenever the Fire Marshal disapproves an application or refuses to grant a permit applied for, the applicant may appeal the decision to the City's Hearing Examiner. A written notice of appeal shall be filed with the City Clerk within 14 days of the date of final decision by the Fire Marshal. The notice of appeal must be accompanied by an appeal fee in accordance with the Fire Department Fee Schedule adopted by resolution of the City Council.

B. The Notice of Appeal shall contain the following information:

1. The name of the appealing party.
2. The address and phone number of the appealing party; and if the appealing party is a corporation, association or other group, the address and phone number of a contact person authorized to receive notices on the appealing party's behalf.
3. A statement identifying the decision being appealed and the alleged errors in that decision.
4. The Notice of Appeal shall state specific errors of fact or errors in application of the law in the decision being appealed, the harm suffered or anticipated by the appellant, and the relief sought. The scope of an appeal shall be limited to matters or issues raised in the Notice of Appeal.

C. Upon timely filing of a Notice of Appeal, the Fire Marshal shall set a date for hearing the appeal before the City's Hearing Examiner. Notice of the hearing will be mailed to the applicant.

D. Deference shall be given to the decision being appealed. The standard on review shall be based upon a preponderance of evidence. The Hearing Examiner may affirm, reverse or modify the Fire Marshal, or his/her designee's, decision.

E. The decision of the Hearing Examiner shall be final.

(Ord. 2505 §6, 2016; Ord. 2437 §18, 2014)