



**City of Mercer Island  
Community Planning & Development  
Fire Code Review and Inspection**

9611 SE 36<sup>th</sup> Street • Mercer Island, WA 98040-3732  
PHONE (206) 275-7605 • FAX (206) 275-7726  
[www.mercerisland.gov](http://www.mercerisland.gov)

## ***Commercial Fire Alarm Standards***

### **FIRE ALARM SYSTEMS**

#### **GENERAL:**

This standard sets forth the requirements for the design, installation, testing, maintenance and monitoring of all fire alarm system installations in the City of Mercer Island, including those monitoring sprinkler systems. All such fire alarm systems shall conform to this Standard and the following documents:

The Mercer Island Building Code (Currently Adopted)

The Mercer Island Fire Code (Currently Adopted)

State of Washington Administrative Code 51-54

NFPA Standard 72, "National Fire Alarm Code", as adopted

Mercer Island Electrical Code, as adopted

Nationally recognized standards as accepted by the Fire Marshal.

The most specific and/or restrictive provision shall apply if conflicts occur between the requirements found in these documents, as determined by the Fire Code Official.

Mercer Island Fire Department Standards shall constitute the primary reference document for the installation of automatic fire alarm and detection systems.

Required submittals, reviews, approvals, and inspections by the Mercer Island Fire Department are based upon City of Mercer Island adopted codes and ordinances, Mercer Island Fire Standards, and nationally recognized standards.

All companies monitoring, installing, maintaining, or servicing fire alarm systems within the City of Mercer Island shall have a valid City of Mercer Island business license.

Any individual doing acceptance tests, confidence tests, modification, repair, remodel, or addition to a new or existing system shall also have Seattle Certification and/or a "LIMITED ENERGY SYSTEM CERTIFICATE (06)" per WAC 296-46B-920.

Where NFPA requires reporting to the AHJ, such reports are required to be sent in a timely manner. Reports identifying system deficiencies shall be submitted within 5 working days to the Mercer Island Fire Marshal's Office.

Such reports may be faxed to the Mercer Island Fire Department – Fire Marshal's Office at (206) 275-7970 or mailed to:

**City of Mercer Island  
Fire Department  
Fire Marshals Office  
9611 SE 36<sup>th</sup> Street  
Mercer Island, WA 98040**

#### **REQUIRED INSTALLATIONS:**

Approved addressable fire alarm systems shall be installed whenever required by the Mercer Island Municipal Code 17.07, or other adopted code.

#### **DEFINITIONS:**

**Dead Panel:** A condition of any fire alarm control panel where the panel has lost both its primary and secondary sources of power.

**Designer of Record:** A competent individual acceptable to, and in good standing with, the Mercer Island Fire Department who designs or directly supervises the design of all fire alarm system submittals, re-submittals, and field changes, until complete installation, testing, and final Fire Department acceptance. See section 9.2.2 for requirements.

**Device:** For Fee purposes. – The following definition of device is provided to assist in the determination of what constitutes a device for the purpose of calculating fees for fire alarm permits and the determination of which alarm permit is to be used.

One fire alarm system device shall be considered any one of the following:

1. a spot detector
2. a visual notification appliance
3. an audible notification appliance
4. a combination audible/visual appliance
5. each piece of a beam detector system
6. a remote power supply
7. a remote annunciator
8. a tamper switch
9. a valve closure switch
10. a low pressure indicator switch
11. a manual initiating appliance
12. a supervisory switch connected to the alarm system
13. a secondary control panel
14. a secondary address point
15. a line type detector, per continuous line
16. a magnetic hold open device
17. an air aspirating type detection system (each hole and control unit)
18. or similar individual piece of equipment or appliance

**NORCOM:** The current (or any subsequent) dispatch center used by the Redmond Fire Department.

**Fire Code Official** – The Chief of the Mercer Island Fire Department or representative authorized to administer, interpret, and enforce the Adopted Codes of the City of Mercer Island Fire Department, or their designees.

**Private Office** - A room or area used for the purpose of conducting business or professional administrative services for 1 or 2 named occupants. Offices for use by an employee of a designated type (such as “lab technician only”) are not considered private.

**Runner Service** Runner service shall be as required for Central Station Service as defined in NFPA 72.

**Third Party Verification:** Is conducted by an independent testing laboratory conducting testing on fire alarm systems, its components, reporting, record keeping, and may include a company’s services and personnel. Mercer Island Fire Department recognizes “Underwriters

Laboratories”, (UL), and “Factory Mutual”, (FM Global). **Other testing agencies or services may be approved by the Fire Marshal.**

### **PLANS AND PERMITS GENERAL:**

Permits shall be issued to the prime contractor, or approved sub-contractor, providing central station service according to NFPA 72.

A valid permit issued by the City of Mercer Island shall be required for all installations or modifications of any automatic fire alarm system including such systems monitoring automatic fire extinguishing or fire sprinkler systems.

**Maintenance or repair of existing components shall not require a permit unless over 3 devices.** This shall include regularly scheduled and emergency work that is being done to maintain the system in operable condition or repair of damage with the replacement of like equipment or devices so as to return the system to an operable condition.

- Replacing a FACP or transmitter requires a permit.
- System upgrades or system expansions require a permit.

A minimum of one permit is required for each building of a multi-building project. A permit is only valid for the work described and by the contractor designated by the permit.

Permits shall be good for 6 months from issuance. An extension may be granted by the Fire Marshal based on the review of a written request, submitted prior to permit expiration, outlining just cause for the requested extension. No permit may be extended after it has expired.

### **PERMITS, PLANS AND SPECIFICATIONS:**

New fire alarm systems shall be of the digital or addressable type and shall not be installed nor shall modifications be made to existing systems until a complete application has been submitted, and a permit has been issued, including a City of Mercer Island low-voltage electrical permit. **The permit inspection card and approved plans must be on site for reference by the Designer of Record, the installer or the fire inspector.**

**Standard Fire Alarm System Permit** shall be used for all FACP, transmitter, or new system installations; or the installation, replacement, or addition of 7 or more devices.

**Tenant Improvement Commercial Fire Alarm Permit** shall be used for the installation, replacement, or addition of a remote power supply, or 6 or fewer devices only on fire alarm systems that have approved existing Third Party Verification.

Work begun under the electrical permit only, proceeds at the installer's risk, and shall not include the placement of devices or equipment.

The only low voltage fire alarm work allowed under an electrical permit only is the stringing of wire and the placement of mounting plates or back boxes.

**Standard Permit Submittal:**

Plans may be uploaded to the CoMI permit center portal:

<https://www.mercerisland.gov/cpd/page/electronically-submit-fire-permit-applications-using-mieplan>

Plans shall include all pertinent information to the scope of work being done.

At a minimum the cover sheet shall include:

1. Prime Contractors name, address, telephone number, contractor's license number and their electrical license number
2. Designer of Record stamp and number
3. Job address
4. Name of tenant
5. General Contractor contact information.
6. Name and contact information for the property management if any
7. Name and contact information of the subscriber
8. Note on the face of the plans the ambient noise range for all the various spaces identified in the plans and the justification (i.e., national standard or previous test) for this ambient level. Also indicate the minimum audibility level (dBm) to be used for the acceptance test.
9. Note on the face of the plans who is contractually responsible for the following:
  - Installation of fire alarm transmitters
  - Alarm, supervisory, and trouble signal monitoring
  - Retransmission

- Associated record keeping and reporting
- Testing and maintenance
- Runner service

Plans shall be on standard drafting paper and shall be clearly legible regarding all pertinent information. The scale of the plans shall be 1/8" per foot.

If base plans are used that have additional but unnecessary information, then the additional information shall be deleted or shall not be copied at greater than half tone.

New systems shall include a labeled site plan of no smaller than 1":50' scale and indicating the location of the FACP and Sprinkler Riser Room(s)

Plans shall include exterior elevations to indicate the location of the exterior bell/strobe and/or annunciators; interior cross sections showing typical areas, concealed spaces or unusual construction characteristics; a riser diagram; and details showing structural and/or mechanical elements which might affect spacing requirements (including any obstruction over 80" A.F.F.).

Location of each and every system component shall be identified using an appropriate symbol as described with a key on each sheet of the plans that show such components.

All system components shall be identified on a component schedule identifying the amount of material, or number of devices to be installed, the temperature rating and power demands (if applicable), manufacturers name, and model number of each type of device, equipment, or material.

Provide a plan view schematic for each floor, showing all zones (including existing zones shown on an existing control panel, if applicable).

All zones must be labeled with a unique and individual letter or number, and identified clearly as to their respective areas of coverage. The schematic shall indicate which zones are to be transmitted individually and which zones are to be grouped for transmission to the central station. Fire alarm zones shall be in accordance with NFPA 72 Section 4.4.6.

Provide a draft of the required zone maps that will be posted on site, adjacent to the fire alarm control panel.

Calculations shall be included with plans that document any deviations from listed spacing, such as reductions for ceiling height or airflow, corridor spacing, or similar; or when otherwise called for in NFPA 72.

### **Tenant Improvement Permit Submittal:**

A qualifying Tenant Improvement Fire Protection Permit shall be submitted with the following items:

Copy of current UL Certificate, FM Placard or Approved Central Station Service alternative and:

- A full description and scope of work for the project.
- The location of the work within the building and space.

One set of manufacturers specification sheets on all equipment to be used, and clearly mark the specific model of equipment used.

**IMPORTANT!** You must include a statement attesting to the compatibility of all new and existing equipment and devices.

The applicant shall be the same as the company listed on the current UL Certificate, FM Placard or Approved Central Station Service alternative. The system certificate or placard shall be updated to reflect the modifications and be posted prior to the final alarm inspection.

### **DESIGNER OF RECORD:**

The designation “Designer of Record” shall refer to a competent individual acceptable to, and in good standing with, the Mercer Island Fire Department who designs or directly supervises the *design* of all alarm system submittals, re-submittals, and field changes, until complete installation, testing, and final Fire Department acceptance. This person shall be designated at the beginning of the job and follow it through to completion.

Any Designer of Record registered with the Mercer Island Fire Department who fails to follow the published process for review, installation, and inspection may jeopardize the designer’s standing with the Mercer Island Fire Department.

Proof of review and acceptance by the Designer of Record shall be provided on the cover sheet for standard permits and on the summary sheet for Tenant Improvement Permits, as follows:

## (Designer of Record Signature Block Example)

### **DESIGNER OF RECORD**

*John J. Designer, Lead Alarm System Designer*

John J. Designer Alarm Company

1234 West South Street

Seattle, WA, 99999

Phone: 425-555-5555

Fax: 425-555-0000

Designer #: 00-B-999

Acceptable proof of competence shall be any one of the following:

**“A”** - State of Washington Professional Electrical or a Fire Protection Engineer’s license is required. Documentation of certification shall be provided to the Building Official. Satisfactory documentation shall be accepted in writing by the Building Official and by the assignment of a designer number.

**“B”** - A valid NICET Level III or higher Certification for Fire Alarm Systems is required. Documentation of certification shall be provided to the Building Official. Satisfactory documentation shall be accepted in writing by the Building Official and by the assignment of a designer number. (Current Mercer Island fire alarm designers shall meet the minimum requirements of NICET III effective 7/1/2012.

Existing Designers of Record that are qualified with a NICET Level II may request an extension of the expiration date of their DOR, not to exceed July 1, 2012. After this date all Designers will need to qualify under either “A” or “B” above.

### **FEES:**

Fees for **“Tenant Improvement”** permits shall be due and payable at the time of permit application and issuance. The fee will be based upon the proposed number and type of devices, plan review time and inspection time. Fees paid on Tenant Improvement permits are non-refundable.

The fee for **Standard Permits** will be based upon the proposed number and type of devices. The projected permit, plan review and inspection fees, shall be due and payable at the time of permit issuance and plan pick up.



One submittal and one re-submittal will be processed under the initial permit, review, and inspection fees. The review will be performed during normal business hours in the established order. An hourly rate as noted in the adopted fee schedule shall be charged for additional review time for a second or subsequent re-submittal. Additional required devices identified during review may change the base fee amount. If adjustments are made they shall be reflected in a revised permit fee. Fee changes resulting from additional reviews or devices shall be added to the base permit fees and shall be payable prior to permit issuance.

The Designer of Record shall inform the Mercer Island Fire Marshals Office at 206-275-7966, if there are discrepancies between the permit description of work and the work as actually installed (field changes).

If more devices are installed than shown on the permit, then any additional fees shall be billed to the permit holder.

One inspection and two re-inspections are included in the initial permit fees. Additional inspection or re-inspection hours required to final the project shall be charged based upon the City of Mercer Island hourly fee minimum three hours.

Early morning, evening , weekend, or holiday inspections are a customer service option that may be available but not guaranteed. The inspection fee is chargeable to the requesting applicant at the City of Mercer Island hourly rate with a three-hour minimum. The requesting party must make the request in writing and include job, permit, and billing information.

## **SYSTEM DESIGN:**

### **GENERAL SYSTEM AND DESIGN REQUIREMENTS:**

**9.3.1.1;** All fire alarm systems and fire sprinkler systems located in the City of Mercer Island (unless specifically excluded by a provision of these standards) shall be monitored by a listed central station approved by the Mercer Island Fire Department. Any company providing listed central station service and which meets the requirements and performance standards for central station monitoring as listed in NFPA72 section 8.3.2 and shall be approved by the Mercer Island Building Official's Office.

All equipment, devices, and wiring shall be listed by Underwriters Laboratories, Factory Mutual, or another nationally recognized testing agency and shall be used in accordance with their listings.

No person shall perform any type of modification to any device or equipment which would void or be contrary to its listing.

The system shall be designed and installed in accordance with NFPA 72, Mercer Island Building Official's Office, and 2009 IFC for placement except where specifically noted in this standard.

All equipment shall be securely mounted to the structure. Back boxes and straps are required for installations on drop in tile and "t" bar ceilings or similar construction. All junction ("j") boxes used for low voltage fire alarm wiring shall have red painted cover plates.

There shall be a minimum 10" fire alarm bell (sprinkler water flow) and horn/clear strobe (fire alarm only) light located on the exterior of all buildings with a required fire alarm system, or a sprinkler system monitored by a fire alarm system. The bell and horn/strobe shall be located on the upper 25% of the building's exterior, facing the street or roadway off of which the building is addressed; or facing the roadway which serves as the main vehicle entrance from that street or roadway; or as directed by the Fire Marshal. A lower location shall be used when tall buildings are built close to a narrow right of way or to avoid obstructions.

#### **CONTROL PANEL REQUIREMENTS:**

Fire alarm control panels (FACPs) shall be digital (addressable), secondary control units shall be full function type and located in an approved location. Remote power supplies and remote annunciators shall be mounted no higher than 5' 6" above finish floor to the top of the viewing window or controls.

There shall be a smoke detector above the FACP, releasing panels, power supplies, and any other control panel. 72-4.4.5

If the FACP is located in a room that is not normally occupied, then a remote audible/visual trouble annunciator shall be located in a normally occupied room or area near a main entrance. Fire alarm annunciators shall be located in an approved location, no higher than 5' 6" above finish floor to the top of the viewing panel or controls. Owners or occupants shall not have access to the annunciator access code or keys for fire alarm control functions.

A pre-signal feature as found in NFPA 72 6.8.1.2 shall not be allowed.

In occupancies that require regular fire drills; such as but not limited to educational, daycare, institutional, nursing, or retirement occupancies; panels shall include an audible test feature. When activated the test switch shall energize all interior alarm indicating devices but shall not transmit an alarm to the central station

**When allowed by special permission,** analog fire alarm control panels shall have various zones of initiating devices grouped by type (water flow, smoke, heat, trouble, or supervisory), and by zone (1<sup>st</sup> floor, 2<sup>nd</sup> floor). Addressable systems shall have the initiation device descriptions as approved by the fire inspector. Special systems (FM-200, Pre-action, hood systems) shall be grouped separately from other signals or zones.

Signals sent from the fire alarm control panel to the central station, for fire department dispatch, shall be grouped by type (general fire, trouble or supervisory), and by zone (1<sup>st</sup> floor, 2<sup>nd</sup> floor).

All required alarm systems used for monitoring required fire protection systems of any type shall have an approved FACP and an approved transmitter. A transmitter shall not be used alone, where stand alone transmitters are no longer functional or adequate the replacement system shall meet current Code.

**Key pads with access codes shall not be used for control of a new FACP.**

Use of existing key pads for fire alarm panel control shall be discontinued upon system modification. Existing key pads shall use a Mercer Island Fire Marshal approved access code and have clear, easily visible, and readily accessible instructions for operation by Mercer Island Fire Department or alarm company authorized personnel. Owners or occupants shall not have access to the key pad access code for fire alarm control functions.

**Combination fire systems shall not be allowed (NFPA 72 – 6.8.4)**

**INITIATING DEVICES:**

All smoke detectors or other initiating devices shall be installed according to the Mercer Island Fire Marshal Standards and the manufacturer's specifications and instructions. SMOKE DETECTORS SHALL BE PHOTOELECTRIC UNLESS PERMISSION FOR OTHER TYPE HAS BEEN GRANTED BY THE MERCER ISLAND FIRE MARSHAL.

Full alarm system coverage for a building is required and shall consist of at least one heat detector, smoke detector or other approved device placed in all rooms, halls, storage areas, basements, attics, lofts, spaces above suspended ceilings, concealed spaces, enclosed storage lockers, closets, walk-in closets or storage containers, attached carports or canopies, booths, saunas, electrical rooms, machine or elevator equipment rooms, and any other rooms, areas as require by the Fire Marshal. Omission of deivces may be granted upon Code Alternative requests.

Pull stations that are subject to repeated false alarms shall be fitted with an approved, local-alarming, cover, or ,may be removed as NFPA 72 allows.

Duct detectors for the control of air handling equipment shall be reported as a supervisory zone and not as an alarm zone. For existing duct detectors they shall be switched from alarm signal to supervisory signal.

**NOTIFICATION DEVICES:** See IFC, Chapter 9 and NFPA 72.

**MONITORING:**

NFPA 72 SECTIONS 8.3, 8.4, 8.5 AND 8.6.

All required fire systems within the jurisdiction of the City of Mercer Island shall be monitored with approved Central Station Service per NFPA 72, or an approved alternate.

All fire system monitoring shall utilize only approved means of transmission of signals. Alarm transmission shall be by an approved active multiplex transmitter able to transmit and receive status changes, manually or automatically, from an approved alarm panel to an approved central station by one of the following methods:

- a) Direct wire, derived channel type 1
- b) Dedicated leased telephone lines,
- c) "Scan Alert",
- d) Digital Alarm Communicator Systems (DACs)
- f) Digital Alarm Communicator Transmitter over a "Scan Alert" supervised line using a listed internal or external STU
- g) By other means as approved by the Fire Marshal.

Fire alarm transmitters shall be located in the same room as the FACP. It shall be climate and temperature controlled to maintain the rated design limits of the equipment.

McCulloh or McCulloh loop are not approved.

All central stations serving protected sites in Mercer Island shall have a direct ring down line to NORCOM as the primary means of alarm transmission.

All central stations serving protected sites in Mercer Island shall have a local access telephone number for the purposes of communication to and from the Mercer Island Fire Department, and to and from NORCOM. This line shall constitute the secondary means of alarm transmission.

A local access telephone number shall be characterized by any number that can be dialed from the Mercer Island Fire Department without dialing long distance.

### **SIGNS AND SECURITY:**

Access to all fire alarm control panels shall be secured with a lock.

Alarm company representatives or subcontractors (with the central station, the installation company, the maintenance company, or emergency repair service company), sprinkler contractors, or representatives of the Mercer Island Fire Department shall be the only persons authorized to open or operate an alarm panel.

When control panels are located inside approved NEMA weatherproof enclosures, closets, or cabinets these enclosures shall be openable without the use of tools. Keys for locks on these doors shall be labeled and kept in the Knox Key Safe.

All buildings having required fire protection systems shall install an approved emergency key box. All entrance door keys, grand master keys, master keys, any special keys or access cards, and alarm panel keys shall be labeled and provided by the owner or occupants for installation into the key box. The only approved key box system for use within the jurisdiction or influence of the City of Mercer Island is "Knox" [www.knoxbox.com](http://www.knoxbox.com) . For specific information, or the acceptable installation location contact the Mercer Island Building Official's Office for the job.

When a control panel is located in a room, the outside of the door shall have a sign with minimum 1 ½" high letters with ½ " stroke which reads "Fire Alarm Control Panel". Signs shall be high-contrast, white lettering on red background. In some cases more than one door may be required to be marked in order to identify the panel location. Exterior signs shall be of metallic construction and weather resistant. Where the alarm panel room is also the sprinkler riser room both designations shall be used.

**ACCEPTANCE TESTING & CERTIFICATE OF COMPLETION:  
NFPA 72 SECTIONS 4.5, 4.6, CHAPTER 10  
ACCEPTANCE TESTING:**

**Prior to requesting a final system inspection and acceptance test the installer shall perform a satisfactory, 100% test of the system.**

The entire system shall be tested from devices to panel to central station unless a phasing plan has been approved by the Fire Marshal prior to the request for final inspection of the system. An NFPA 72 compliant "Certificate of Completion" form shall be completed up to the final inspection and testing portion, and submitted (or faxed) to, and received by the Mercer Island Fire Marshal's Office before a request for final inspection will be completed in the computer system or signed off by the permit.

Prior to requesting a final system inspection, the electrical supply system including alarm wiring methods and materials must be approved by the City of Mercer Island electrical inspector.

After the successful conclusion of the acceptance test the remainder of the Certificate of Completion shall be filled out and forwarded to the Mercer Island Building Official. All zones shall be defined by a written description not merely differentiated by number or letter. This may be done by use of a description key or zone schedule.

**NOTIFICATION:**

The Fire Marshal shall be notified when any required fire alarm system is placed temporarily out of service and upon restoration of normal service. Contact shall be to NORCOM at (425) 577-5700 Be prepared to Include the location, occupancy name, time the system is placed out of service, estimated time the system will be out of service, technician's name and company, and the name and phone number of the monitoring company.

Central Stations shall notify the Mercer Island Fire Department in writing *at* least 14 days prior to the termination of service from an expired contract.

This may be by letter, email [fire\\_marshal@mercerisland.gov](mailto:fire_marshal@mercerisland.gov)

Central Stations shall notify the Mercer Island Fire Department in writing at least 21 days prior to the discontinuance of service. This may be sent to [fire\\_marshal@mercerisland.gov](mailto:fire_marshal@mercerisland.gov).

### **SYSTEMS OUT OF SERVICE:**

In the event of temporary failure of the fire alarm system or an excessive number of accidental or non-fire alarm activations, the Fire Code Official or designee is authorized to require the building owner or occupant to provide standby personnel as set forth in "MERCER ISLAND FIRE WATCH" until the system is restored. While the system is out of service for maintenance or repair the technicians who have placed the system out of service shall be responsible for the duties of a fire watch.

While any system in an occupied building, or in an unoccupied building, building under construction or building undergoing demolition is shut down, disabled, disarmed, or placed on standby, the sprinkler or fire alarm contractor, installer, runner, or technician, shall be responsible for performing the duties of a fire watch, including maintaining alertness to a fire generated in any space covered by the inoperative system, notification of all occupants as to the status of the system, and maintaining at all times direct access to a reliable means of communication to the fire dispatch center for reporting of a fire incident.

While any system in an unoccupied building, building under construction or building undergoing demolition is shut down, disabled, disarmed, or placed on standby, and there are no workers in the structure the sprinkler or fire alarm contractor, installer, runner, or technician, shall be responsible for notification of the owner of the building as to the status of the system. The building shall be provided with an approved security plan in keeping with the value of the building and contents. This may range from the temporary boarding up or fencing off of the structure to a full fire watch. An informational help sheet for posting a fire watch as well as a log may be found here:

<https://www.mercerisland.gov/cpd/page/fire-permits-and-prevention-information>