

# City of Mercer Island

## Fire Department Development Standards Guide



## **New Construction Fire Code Applications Guide for One- and Two-Family Residential Development**

**This guide is intended to provide assistance in the application of the fire code  
within the City of Mercer Island**

**Mercer Island Fire Department**

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**Mercer Island CPD**

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## **AUTHORITY AND SCOPE**

These rules are adopted under the authority of Chapter 19.27 RCW and WAC 51-54A-002. The purpose of these rules is to implement the provisions of Chapter 19.27 RCW, which provides that the State Building Code Council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the Council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by Council. Construction code amendments have been adopted under Mercer Island Municipal Code section 17.07.

The information in this document is intended to assist applicants in attaining compliance and to ensure that privately owned roadways identified for emergency response will be available for use at all times.

## **LOCAL DEVELOPMENT CODES**

*City of Mercer Island Development Codes may be located at:*  
<https://mercerisland.municipal.codes/>

## **HELPFUL LINKS:**

*Washington Fire Code:*  
<https://up.codes/viewer/washington/ifc-2015>

*City of Mercer Island Web Page:*  
[www.mercerisland.gov](http://www.mercerisland.gov)

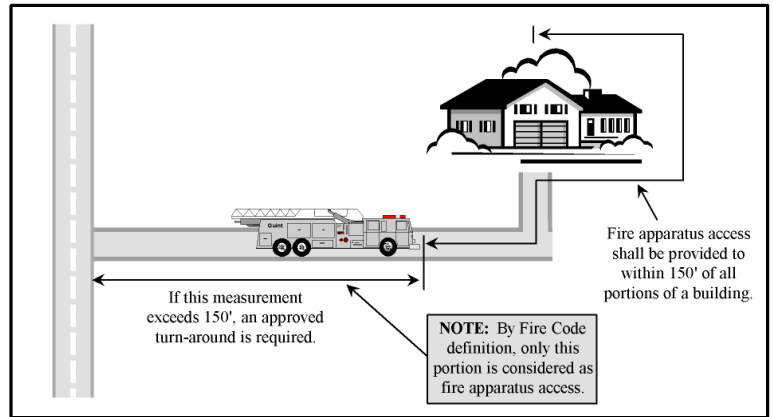
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# Fire Apparatus Access

**FIRE APPARATUS ACCESS ROAD DISTANCE FROM BUILDINGS AND FACILITIES:** Access roads shall be within 150 feet of all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building or facility. An approved turnaround is required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet. (MIMC 17.07.020)

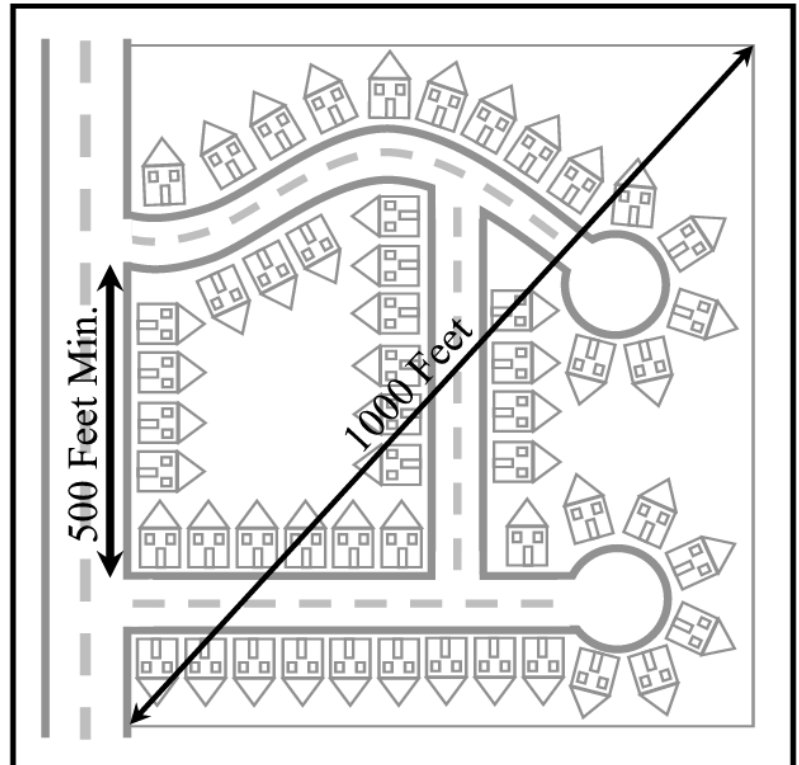


**FIRE APPARATUS ACCESS ROAD WIDTH AND VERTICAL CLEARANCE:** Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants (MICC 17.07.020) and an unobstructed vertical clearance of not less than 13 feet 6 inches. (IFC503.2.1)

**FIRE APPARATUS ACCESS ROADS FOR INDIVIDUAL ONE AND TWO FAMILY DWELLINGS AND ACCESSORY STRUCTURES:** The Fire Marshal may approve access roads of less than 20ft with the installation of additional fire protection systems as approved by the Fire Marshal. (IFC 503.2.2)

**ADDITIONAL ACCESS ROADS – ONE- AND TWO-FAMILY RESIDENTIAL DEVELOPMENTS:** Developments of one- and two-family dwellings, where the number of dwelling units exceeds 30 shall be provided with separate and approved fire apparatus access roads and shall meet the requirements of Section D104.3. Exception: Where there are more than 100 dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with section 903.3.1.1, 903.3.1.2, or 903.3.1.3 of the International Fire Code, access from two directions shall not be required.

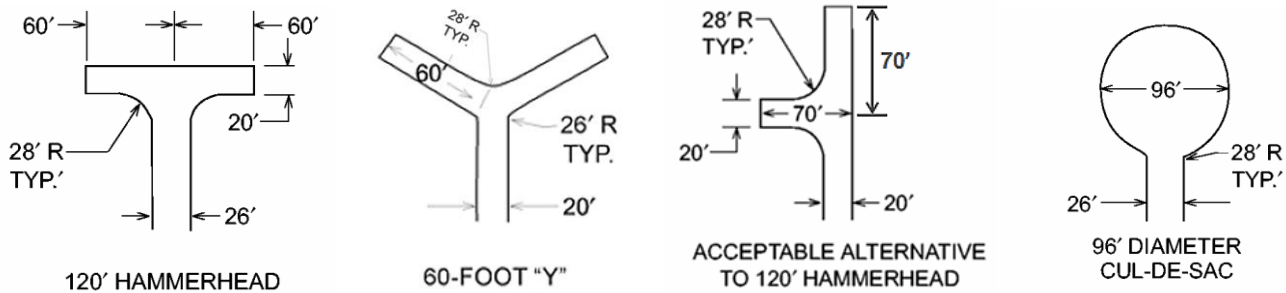
**MULTIPLE ACCESS ROADS SEPARATION:** Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the area to be served (as identified by the Fire Marshal), measured in a straight line between accesses.



**PREMISES IDENTIFICATION:** New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property, including monument signs. These numbers shall contrast with their background. Numbers shall be a minimum of 6 inches high with a minimum stroke width of 1/2 inch. (MIMC 17.07.020 (o), amended IFC 505.1)

**ACCESS DURING CONSTRUCTION:** Approved fire apparatus access roadways shall be installed and operational prior to any combustible construction or storage of combustible materials on the site. Temporary address signage shall also be provided during construction. (IFC 505.2)

**DEAD END ROADS AND TURNAROUNDS:** Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround. Diagrams of approved turnarounds are shown below: (IFC D103.1)



**TURNING RADIUS:** The inside turning radius and outside turning radius shall not be less than 28 feet and 48 feet respectively, measured from the same center point. (ICC D103.3)

**TURNOUTS:** Where access roads are less than 20 feet and exceed 400 feet in length, turnouts 10 feet wide and 30 feet long may be required and will be determined on a case by case basis. (ICC 503.2.2)

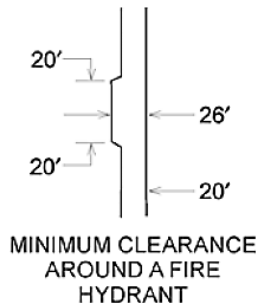
**ACCESS ROAD GRADE:** Fire apparatus access roadway grades in excess of 10% will require additional fire protection systems as approved by the Fire Marshal. (IFC 503.2.7) No grades shall exceed 20%.

**AERIAL APPARATUS OPERATING GRADES:** Portions of aerial apparatus roads that will be used for aerial operations shall be as flat as possible. Front to rear and side to side maximum slope shall not exceed 10%.

**ANGLE OF APPROACH/GRADE FOR TURNAROUNDS:** Turnarounds shall be as flat as possible and have a maximum of 5% grade.

**ANGLE OF APPROACH/GRADE FOR INTERSECTIONS:** Intersections shall be level (maximum 5%).

**FIRE APPARATUS ACCESS ROADS WITH FIRE HYDRANTS:** Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet and shall extend 20 feet before and after the point of the hydrant. (ICC D105.4)



**SURFACE AND LOAD CAPACITIES:** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced as to provide all-weather driving capabilities. (IFC 503.2.3)

**BRIDGES, UNDERGROUND STRUCTURES AND SIMILAR:** Where a bridge or an elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with AASHTO HB-17. (cont.)

A building permit shall be obtained for the construction of the bridge if required by the building official and fire code official. The design engineer shall prepare a special inspection and structural observation program for approval by the building official. The design engineer shall give, in writing, final approval of the bridge to the fire district after construction is completed. Maintenance of the bridge shall be the responsibility of the party or parties that use the bridge for access to their property. The fire department may at any time, for due cause, ask that a registered engineer inspect the bridge for structural stability and soundness at the expense of the property owner(s) the bridge serves. Vehicle load limits shall be posted at both entrances to bridges when required by the Fire Marshal. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the Fire Marshal. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the Fire Marshal. (IFC 503.2.6)

**GATES:** Gates securing fire apparatus roads shall comply with all of the following: (see Appendix G)

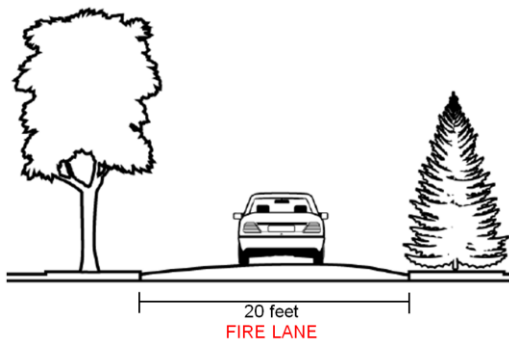
1. Minimum unobstructed width shall be not less than 20 feet (or the required roadway surface width)
2. Gates serving three or less single-family dwellings shall be a minimum of 12 feet in width.
3. Gates shall be set back a minimum of 30 feet from the intersecting roadway or as approved.
4. Gates shall be equipped with a means for operation by fire department personnel. (see Appendix G)
5. Electric automatic gates shall comply with ASTM F 2200 and UL 325.
- 6.

**TRAFFIC CALMING DEVICES:** Shall be prohibited on fire access routes unless approved by the Fire Marshal. (IFC 503.4.1)

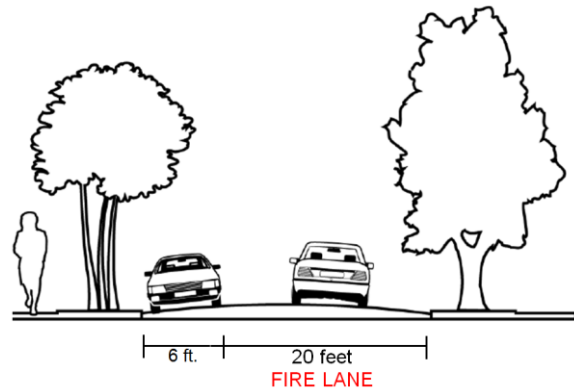
**NO PARKING:** Parking on emergency access roads shall be as follows :

1. 20-26 feet road width – no parking on either side of roadway
2. 26-32 feet road width – parking is allowed on one side of the roadway
3. Greater than 32 feet road width – parking is not restricted

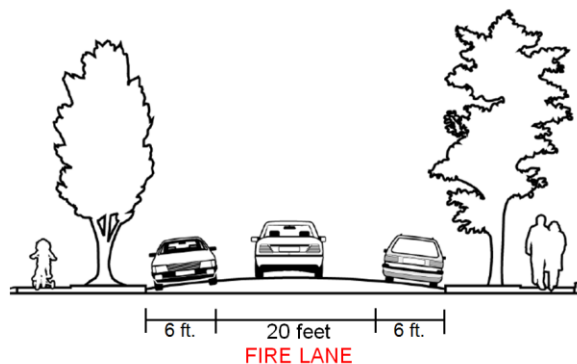
Parking prohibited on either side:



Parking prohibited on one side only:



Parking permitted on both sides:



**NO PARKING SIGNS:** Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, "No Parking" signs shall be installed on one or both sides of the roadway and in turnarounds as needed.

Signs shall read "NO PARKING - FIRE LANE" and shall be installed with a clear space above grade level of 7 feet. Signs shall be 12 inches wide by 18 inches high and shall have red letters on a white reflective background. (IFC D103.6)



**PAINTED CURBS:** Where required, fire apparatus access roadway curbs shall be painted red (or as approved) and marked "NO PARKING FIRE LANE" at 25 foot intervals. Lettering shall have a stroke of not less than one inch wide by six inches high. Lettering shall be white on red background (or as approved).

## Building Access and Fire Service Features

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**KNOX BOX:** A Knox Box, padlock, or Knox key switch for gate access may be required. See appendix A for further information and detail on required installations. Order via [www.knoxbox.com](http://www.knoxbox.com) or contact Mercer Island Fire Department for assistance and instructions regarding installation and placement. (IFC 506.2))

## Firefighting Water Supplies

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**INDIVIDUAL ONE- AND TWO-FAMILY DWELLINGS:** The minimum available fire flow for one and two-family dwellings served by a fixed and reliable (municipal) water supply shall be the required fire flow determined according to ICC Appendix B.

**FIRE SPRINKLER SYSTEMS:** All newly constructed residential structures shall be equipped with an automatic fire sprinkler system approved by the Fire Marshal.

**ACCESSORY STRUCTURES:** Fire-flow is not required for structures under 500 square feet with a B, U, or R-1 occupancy where structures are at least 30 feet from any other structure and are used only for recreation.

**FIRE FLOW WATER AVAILABILITY:** Applicants shall provide documentation of a fire hydrant flow test or flow test modeling of water availability from the local water purveyor if the project includes a new structure or increase in the floor area of an existing structure. Tests shall be conducted from a fire hydrant within 400 feet for commercial projects, or 600 feet for residential development. Flow tests will be accepted if they were performed within 5 years as long as no adverse modifications have been made to the supply system. Water availability information may not be required to be submitted for every project.

**WATER SUPPLY DURING CONSTRUCTION:** In areas with fixed and reliable water supply, approved firefighting water supplies shall be installed and operational prior to any combustible construction or storage of combustible materials on the site.



**FIRE HYDRANT NUMBER AND DISTRIBUTION:** The minimum number and distribution of fire hydrants available to a building shall not be less than that listed in IFC Table C 105.1.

**TABLE C105.1  
NUMBER AND DISTRIBUTION OF FIRE HYDRANTS**

FIRE-FLOW REQUIREMENT (gpm)	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS <sup>a,b,c</sup> (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT <sup>d</sup>
1,750 or less	1	500	250
2,000-2,250	2	450	225
2,500	3	450	225
3,000	3	400	225
3,500-4,000	4	350	210
4,500-5,000	5	300	180
5,500	6	300	180
6,000	6	250	150
6,500-7,000	7	250	150
7,500 or more	8 or more <sup>e</sup>	200	120

For SI: 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

- a. Reduce by 100 feet for dead-end streets or roads.
- b. Where streets are provided with median dividers which can be crossed by firefighters pulling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis up to a fire-flow requirement of 7,000 gallons per minute and 400 feet for higher fire-flow requirements.
- c. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.
- d. Reduce by 50 feet for dead-end streets or roads.
- e. One hydrant for each 1,000 gallons per minute or fraction thereof.

**FIRE HYDRANT(S) PLACEMENT:**

- Existing hydrants in the area may be used to meet the required number of hydrants as approved. Hydrants that are up to 600 feet away from the nearest point of a subject building that is protected with fire sprinklers may contribute to the required number of hydrants.
- Hydrants that are separated from the subject building by divided highways or freeways shall not contribute to the required number of hydrants. Heavily traveled collector streets may be considered when approved by the Fire Marshal.
- Hydrants that are accessible only by a bridge shall be acceptable to contribute to the required number of hydrants only if approved by the Fire Marshal.

**FIRE HYDRANT DISTANCE FROM AN ACCESS ROAD:** Fire hydrants shall be located not more than 15 feet from an approved fire apparatus access roadway unless approved by the Fire Marshal.

**FIRE HYDRANTS – ONE- AND TWO-FAMILY DWELLINGS & ACCESSORY STRUCTURES:** Where a portion of a structure is more than 600 feet for non-sprinklered structures or 600 feet from sprinklered structures from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the structure(s), on-site fire hydrants or additional fire protection systems shall be required as approved by the Fire Marshal.

**PRIVATE FIRE HYDRANT IDENTIFICATION:** Private fire hydrants shall be approved by the Fire Marshal.

**REFLECTIVE HYDRANT MARKERS:** Fire hydrant locations shall be identified by the installation of blue reflective markers. They shall be located adjacent and to the side of the center line of the access roadway that the fire hydrant is located on. In the case that there is no center line, then assume a center line and place the reflectors accordingly.

**PHYSICAL PROTECTION:** Where fire hydrants are subject to impact by a motor vehicle, guard posts, bollards or other approved means of protection shall be provided. (ICC 507.5.6 & IFC 312)

**CLEAR SPACE AROUND FIRE HYDRANTS:** A 3 foot clear space shall be provided around the circumference of fire hydrants. (ICC 507.5.5)

# Appendix

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- Appendix C Fire Hydrant Design Standard ..... 14
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Mercer Island Fire Marshal's Office  
3030 78<sup>th</sup> Avenue SE  
Mercer Island, WA 98040  
(206) 275-7966

## Knox Box Standard

The City of Mercer Island Fire Department has adopted the use of the Knox Key Entry System. This system is approved as outlined in this document for use on residential, commercial and gate access systems within the City of Mercer Island. Further information may be found on our web page at [www.mervergov.org](http://www.mervergov.org) or by contacting the Mercer Island Fire Marshals Office at 206-275-7966.

### Approved Knox Box Types: (must exceed the number of keys)

3200 series flush mount – holds up to 10 keys

4100 series flush mount – holds up to 24 keys

4400 series flush mount (single lock) – holds up to 50 keys

- **Recess mount is preferred. Surface mount must be approved by the Fire Marshal.**
- **For new masonry or concrete construction use the Recess Mounting Kit for installation**
- **Hinged door preferred.**
- **Single lock only. No double lock.**

### Keys to be provided:

Two sets of keys provided for the main entrance KNOX-BOX.

One set of keys provided for any other KNOX-BOX.

Sets of keys will be stored on one key ring.

Key markings required if over 9 keys total in a set (listed below)

USE	METALS STAMPED OR ENGRAVED	COLOR COATED
Entry	Main or Master	GREEN
Riser / Fire Alarm Rom	Riser/Fire Alarm	RED
Utility / Storage Room	Utility / Storage	YELLOW
Fire Alarm Panel	N/A	N/A
Pull Station Reset	N/A	N/A
Misc. Keys	N/A	N/A

### **Installation tips:**

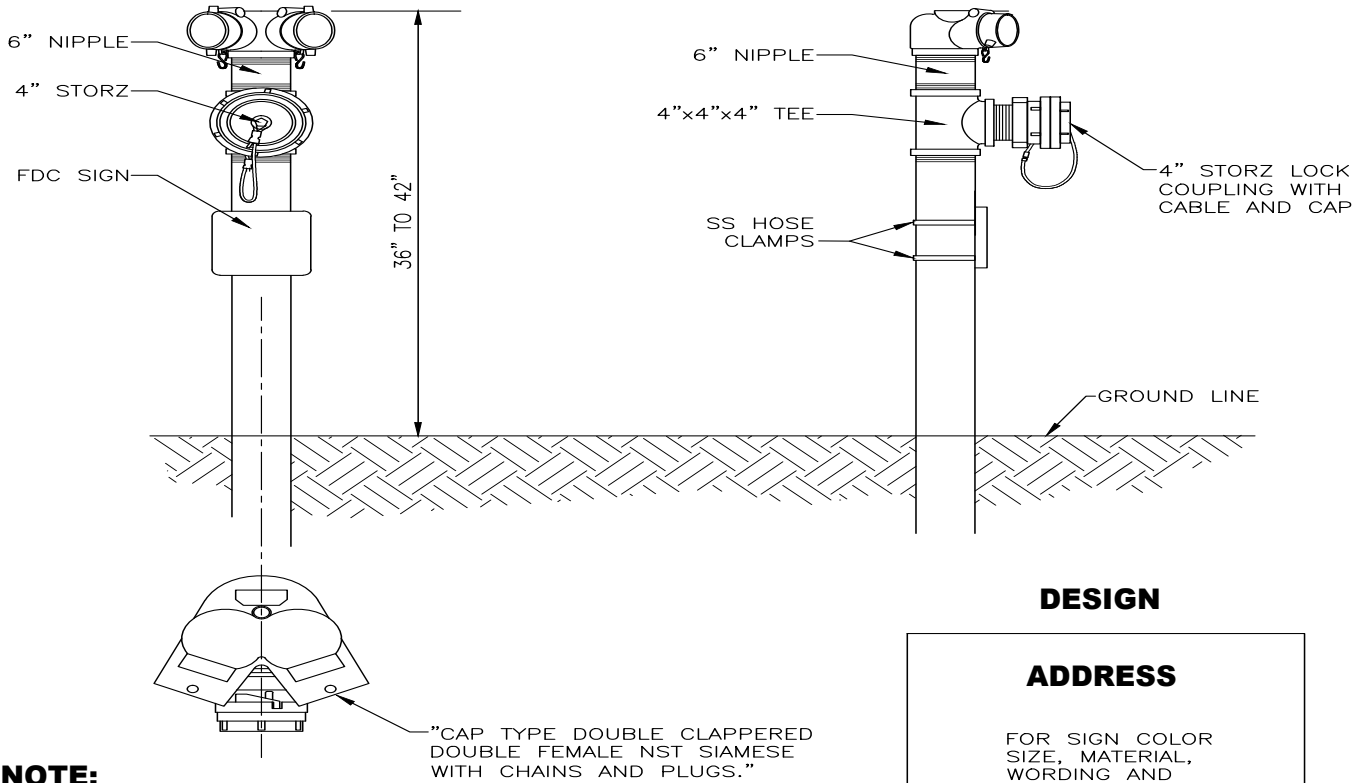
- Install KNOX-BOX 6 feet above the ground to resist vandalism.
- Plumb the vault square.
- Caulk the sides and top between the wall and the box for water proofing.
- Install the shell including the cover plate flush with the finish wall.
- Avoid installation area with excessive moisture.
- Do not over tighten mounting bolts as this will distort the flange.

**For specific model installation and spec sheets go to [www.knoxbox.com](http://www.knoxbox.com)**



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 Mercer Island, WA 98040  
 (206) 275-7966

# Mercer Island Fire Standpipe Design



**NOTE:**

SIGN REQUIREMENTS

1. ALL MATERIALS SHALL BE NFPA 14 COMPLIANT.
2. SIGN AND LETTER COLORS  
SIGN SHALL BE WHITE LETTERS ON A RED BACKGROUND.
3. SIZE AND MATERIAL  
2" BLOCK LETTERS STENCIL PAINTED ON METAL OR
4. SIGN TERMINOLOGY
  - A. SPRINKLERS ONLY: "SPRINKLER" WITH JOB ADDRESS.
  - B. SPRINKLERS AND INTERIOR STANDPIPE: "SPRINKLER-STANDPIPE" WITH JOB ADDRESS.
  - C. STANDPIPE ONLY: "STANDPIPE" WITH JOB ADDRESS.
5. ADDRESS NUMERALS SHALL BE ABOVE SYSTEM TYPE.
6. NEED TO SHOW HOW TO/WHERE TO INSTALL BALL DRIP.

**DESIGN**

**ADDRESS**

FOR SIGN COLOR  
 SIZE, MATERIAL,  
 WORDING AND  
 LETTER SIZE  
 SEE NOTES.

**STANDPIPE  
 TYPE**



\* Permit Required

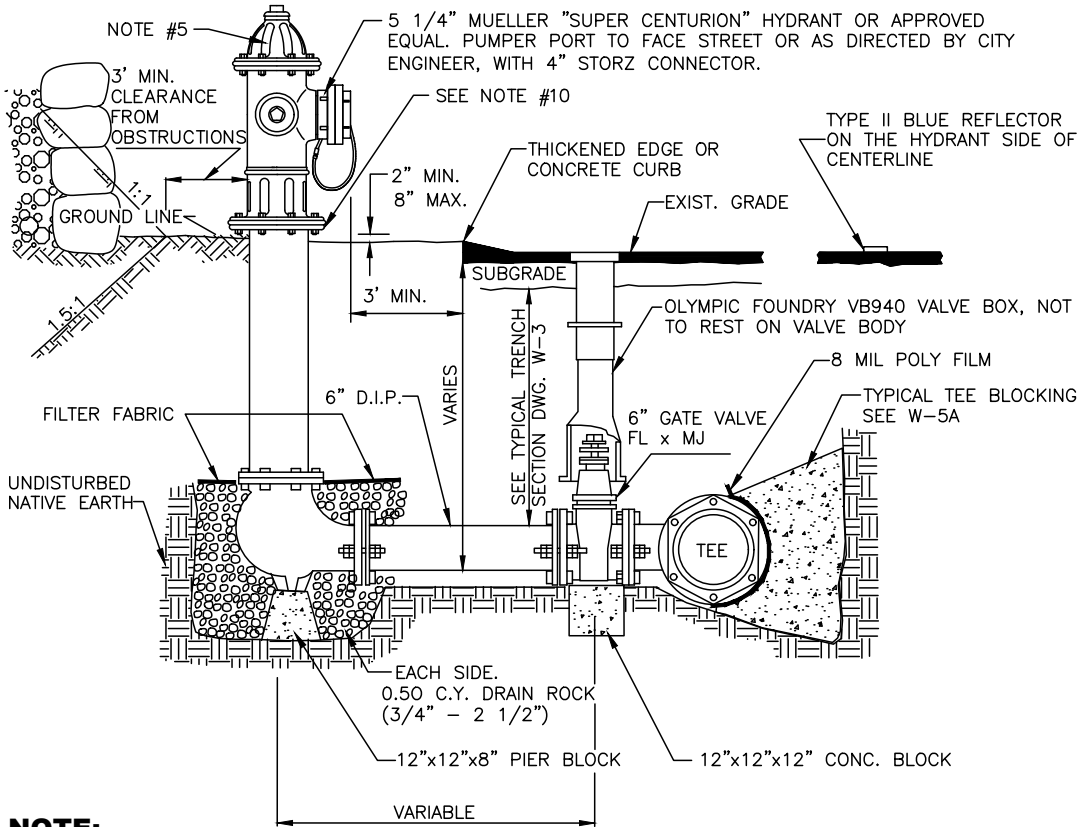
Mercer Island CPD  
 9611 SE 36th Street  
 Mercer Island, WA 98040

360-275-7605



Mercer Island Fire Marshal's Office  
 3030 78<sup>th</sup> Avenue SE  
 Mercer Island, WA 98040  
 (206) 275-7966

# Mercer Island Fire Hydrant Design \*\*



**NOTE:**

1. NO DOMESTIC CONNECTIONS CAN BE MADE TO THE FIRE HYDRANT RUNS.
2. ANY FIRE HYDRANT RUN OVER 18 FEET IN LENGTH OF PIPE SHALL HAVE RESTRAINED JOINT GASKETS.
3. USE ROMA GRIP, OR APPROVED EQUAL, PIPE RESTRAINERS AT VALVE AND HYDRANT BASE.
4. HYDRANT SHALL BE PAINTED WITH 2 COATS OF FARWEST #250 HIGH GLOSS WHITE PAINT, OR APPROVED EQUAL, APPLIED WITH A PAINT BRUSH. DO NOT APPLY PAINT TO STORZ FITTING, BRASS PORT THREADS, OR BELOW SAFETY FLANGE.
5. 1-5 1/4" M.O.V. HYDRANT WITH 2-2 1/2" N.T.S. AND 1-4" PUMPER, SEATTLE STANDARD PIPE THREAD WITH 4" STORZ CONNECTOR HARRINGTON MODEL NO. HPHA40-40NH/CAP. M.J. INLET WITH LUGS, BRASS-TO-BRASS SUB-SEAT, MUELLER "SUPER CENTURION" OR APPROVED EQUAL.
6. BOLLARDS MAY BE USED TO PROTECT THE HYDRANT WHEN NO CURBS ARE PRESENT OR IN EXPOSED AREAS OF PARKING LOTS.
7. STRAIGHT PIPE TO HYDRANTS FROM MAIN NO BENDS.
8. REMOVE CHAINS FROM HYDRANT CAPS.
9. VALVE AND HYDRANT MUST BE PLUMB.
10. THIS DISTANCE IS MEASURED FROM BOTTOM OF SAFETY FLANGE TO LEVEL OF FINISH GRADE BFLOW HYDRANT



Mercer Island Public Works  
 9601 SE 36th Street  
 Mercer Island, WA 98040  
 206-275-7608

*\*permit required. verify standard prior to install*

\*\*Final Fire Hydrant Approval must be obtained from City of Mercer Island Public Works Department. Permit required.





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# 13 D RESIDENTIAL SPRINKLER STANDARD

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These design standards have been adopted by the Mercer Island Fire Department and have been established for the design and installation of sprinkler systems for one- and two-family dwellings, zero lot line townhomes and manufactured homes.

The 2010 edition of NFPA 13, NFPA 13D, and NFPA 13R shall be used unless specifically noted otherwise. The current Mercer Island-adopted building and fire codes shall be used. See Mercer Island Municipal Code Title 17.

## NFPA 13D STANDARD – FIRE SPRINKLER SYSTEM REQUIREMENTS

All requirements of NFPA 13D and the following additions and modifications are required.

- **Water supply**

A 1" minimum water meter and 1" minimum service line is required for all 13D Standard sprinkler Systems. This is the minimum requirement and the sprinkler calculations for the project shall determine the **actual** meter and service line size. The Plumbing Code may still require a larger size. A water meter permit will not be issued until the sprinkler permit is approved. To reduce delays, sprinkler plans shall be completed as early in the process as possible.

- **Water Flow Alarm**

The sprinkler system shall have installed a means of notification for a water flow event.

INTERIOR: You may connect the water flow switch to the sounder side of the line voltage smoke alarms. Firex smoke detectors use part # 0498 and Kidde with relay/power supply module SM120X are currently approved for this purpose.

If you cannot interface the water flow switch to smoke alarms then a separate horn or bell is required to be located on each level including the basement or lowest level of the structure for occupant water-flow notification to a minimum of 75 dBA in the sleeping rooms.

EXTERIOR: An exterior grade 8" Potter bell or equivalent shall be installed.



- **Garage Entry Door Coverage**

A minimum of one head shall be installed on the garage side of the door leading into the residence from an attached garage.

- **Sprinkler System Drain**

The system drain shall be piped all the way to the exterior of the building and not cause damage to landscaping while water is flowing. *Hose connections are not allowed.*

- **Spare Head Box**

A cabinet containing a minimum of two spare heads of each type and a sprinkler wrench shall be provided.

- **Storage Room**

Any crawlspace that has a concrete floor and a full size door shall be presumed to be a future storage room and sprinkler coverage shall be provided.



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# 13 R RESIDENTIAL SPRINKLER STANDARD

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These design standards have been adopted by the Mercer Island Fire Department and have been established for the design and installation of sprinkler systems for one- and two-family dwellings, zero lot line townhomes and manufactured homes.

The 2010 edition of NFPA 13, NFPA 13D, and NFPA 13R shall be used unless specifically noted otherwise. The current Mercer Island-adopted building and fire codes shall be used. See Mercer Island Municipal Code Title 17.

## NFPA 13R PLUS – FIRE SPRINKLER SYSTEM REQUIREMENTS

All requirements of NFPA 13R and the following additions and modifications are required.

- **Water supply**

A 1 1/2" minimum water meter and 2" minimum service line is required for all 13R Plus sprinkler Systems. This is the minimum requirement and the sprinkler calculations for the project shall determine the **actual** meter and service line size. The Plumbing Code may still require a larger size. A water meter permit will not be issued until the sprinkler permit is approved. To reduce delays, sprinkler plans shall be completed as early in the process as possible.

- **Back Flow Preventer**

A 1 1/2" minimum Backflow preventer and Riser is required.

- **Fire Department Connection (FDC)**

A 1 1/2" hose connection is required in a visible location beside the garage door. The check valve shall remain accessible for service. The FDC pipe run shall be a minimum of 1 1/2" and shall maintain that size all the way to the riser.

- **Water Flow Alarm**

The sprinkler system shall have installed a means of notification for a water flow event.

INTERIOR: You may connect the water flow switch to the sounder side of the line voltage smoke alarms. Firex smoke detectors use part # 0498 and Kidde with relay/power supply module SM120X are currently approved for this purpose.

If you cannot interface the water flow switch to smoke alarms then a separate horn or bell is required to be located on each level including the basement or lowest level of the structure for occupant water-flow notification to a minimum of 75 dBA in the sleeping rooms.

EXTERIOR: An exterior grade 8" Potter bell or equivalent shall be installed. This shall be above the FDC.

- **Garage Coverage**

Full coverage of attached garages is required. It is expected that all heads will operate in the event of a car fire within the garage and the system shall be designed to provide adequate flow. Any garages with more than 4 heads in them need to be piped in a manner that a larger flow is available than would be normally designed. An 1 ½" feed shall be provided from the riser to any heads greater than 4 within the garage.

- **Sprinkler System Drain**

The system drain shall be piped all the way to the exterior of the building and not cause damage to landscaping while water is flowing. *Hose connections are not allowed.*

- **Spare Head Box**

A cabinet containing a minimum of two spare heads of each type and a sprinkler wrench shall be provided.

- **Storage Room**

Any crawlspace that has a concrete floor and a full size door shall be presumed to be a future storage room and sprinkler coverage shall be provided.

- **Bathroom Coverage**

All bathrooms regardless of size shall be covered.

- **Closet Coverage**

All closets in common areas or egress pathways shall be covered.

- **Water Flow Monitoring**

Water flow monitoring by a Central Station is required.

- **Decks, balconies and patio Coverage**

Where a roof or deck is provided above, sprinklers shall be installed to protect attached exterior balconies, attached exterior decks, and ground floor patios serving a dwelling unit.



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Mercer Island, WA 98040  
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# HOUSEHOLD FIRE ALARM STANDARD

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## Inspection Scheduling:

Most residential sprinkler, fire alarm and final fire inspections require a three-day notice. Please schedule online at <https://inspection.mybuildingpermit.com/> or by calling the Fire Department Inspection Request Line at (206) 275-7979.

**29.3.5** Fire-warning equipment shall produce the audible signal that is described in ANSI S3.41. Three-Pulse Temporal.

### 29.5.1.1 Required Detection.

- In all sleeping rooms and guest rooms.
- Outside of all sleeping rooms within 21 feet of the door.
- On every level of the dwelling unit, including basement.

### 29.5.1.3 Additional Locations.

- Where the interior floor area of a given floor, excluding garage, is greater than 1000 ft<sup>2</sup>, a minimum of 1 smoke alarm shall be installed for every 500 ft<sup>2</sup>.

### 29.5.2.1.2 Notification.

- Household Fire Alarm Systems (low voltage or wireless) shall notify per 18.4.3 and 18.4.5
  - 18.4.3 Audible Requirements.
    - A minimum sound level of 15 dB above average sound level shall be produced throughout.
  - 18.4.5 Sleeping Areas.
    - A sound level of 15 dB above average sound level and a minimum of 75dBA shall be produced in sleeping areas.
    - A low frequency alarm signal shall be used in all sleeping areas. (*This requirement may be waived by the Fire Code Official if devices are not available*)

**29.7.2** Smoke Alarms and System Smoke Detectors shall be in compliance with UL 268, *Standard for Household Fire Warning System Units*.

## Fire Alarm Circuit

- AC primary power shall not be from a GFCI or Arc Fault protected branch circuit.
- Permanently mark Breaker as “Fire Alarm Circuit”.

**29.7.6.7 System control equipment shall be in compliance with UL 985, *Standard for Household Fire Warning System Units*.**

**29.7.8 Supervising Stations**

- 29.7.8.1.1 Only a single phone line is required to transmit a signal.
- 29.8.1.4 A dedicated cellular phone line shall be permitted.

**29.8.3.1 Peaked Ceilings.** Detectors shall be located not less than 4” vertically or more than 36” horizontally of the peak.

**29.8.3.4 Specific Location Requirements**

(5) Detectors shall not be installed within 36” of a bathroom door containing a shower or tub.

(6) Detectors shall not be installed within 36” of a supply air register and shall be outside of the direct airflow path.

(7) Detectors shall not be installed within 36” of the tip of a fan.

(9) Stairs leading from the basement shall have detectors mounted on the ceiling near the entry to the stair.

**R314.3.1 Installation near cooking appliances.** Photoelectric smoke alarms shall not be installed less than 6 feet horizontally from a permanently installed cooking appliance.

**R314.4 Interconnection**

- Alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all the alarms in the individual dwelling unit.
- Wireless. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

**R314.7.3 Permanent fixture.** Where a household fire alarm is installed, it shall become a permanent fixture of the occupancy, owned by the homeowner.

**R314.7.4 Combination detectors.** Combination smoke and carbon dioxide detectors shall be permitted to be installed in fire alarm systems in lieu of smoke detectors, provided they are listed in accordance with UL 268 and UL 2075.

# CITY OF MERCER ISLAND

Fire Marshal's Office

3030 78<sup>th</sup> Ave SE | MERCER ISLAND, WA 98040

PHONE: 206.275.7966 | [www.mercergov.org](http://www.mercergov.org)



## 2019 RESIDENTIAL FIRE AREA SQUARE FOOTAGE CALCULATION

<b>Project Type:</b> <input type="checkbox"/> New Single Family <input type="checkbox"/> Alteration <input type="checkbox"/> Addition	
<b>Project Address:</b>	
<b>Contact Name:</b>	<b>Phone No.</b>
<b>Owner Name:</b>	

Gross floor area shall be that area in square feet under the roof line of the structure including all usable area whether heated or not, above and below grade. This includes the garage and any unheated storage rooms or attachments including covered decks. If it is *usable space*, then it is included in the **Gross** square footage calculation. *This is not the same calculation for floor area ratio.*

For all construction types, add all the interior wall measurements of each floor and the basement and total that figure.

### NEW CONSTRUCTION *(over for addition or alteration)*

Measurements	Square Footage
Main Floor interior	
Lower Floor interior	
Other Floors interior	
Basement interior	
Attached Garage interior	
Covered Decks interior	
Other interior	
<b>TOTALS</b>	

# ADDITION or ALTERATION

Does this house have an existing **Fire Sprinkler System?** Yes  No  / **Fire Alarm System** Yes  No

Measurements	Existing Square Footage	Standardized Value	Final Square Footage
Main Floor interior		x \$177.76 = _____	
Lower Floor interior		x \$177.76 = _____	
Other Floors interior		x \$177.76 = _____	
Basement interior		x \$177.76 = _____	
Attached Garage interior		x \$ 36.88 = _____	
Covered Decks interior		x \$ 36.88 = _____	
Other interior		x \$177.76 = _____	
<b>TOTALS</b>			

Construction Cost \$ \_\_\_\_\_

### Official Use

Verified Cost \$ \_\_\_\_\_

Higher of Verified or Cost \$ \_\_\_\_\_ / Value \_\_\_\_\_ = % \_\_\_\_\_

- Valuation Ratio
  - Exempt structure – detached garage or similar structure less than 750 sf.
  - Less than 10% (fire review not required)
  - 10 – 49% (monitored Household Fire Alarm System per NFPA 72 Chapter 29, if fire deficiency)
  - 50% or greater (substantial alteration)

### 2015 INT'L FIRE CODE

**901.4.4 Additional Fire Protection Systems.** In occupancies of a hazardous nature, where special hazards exist in addition to the normal hazards of the occupancy, or where the fire code official determines that access for fire apparatus is unduly difficult, the fire code official shall have the authority to require additional safeguards. Such safeguards include, but shall not be limited to, the following:

- Automatic fire detection systems,
- Fire alarm systems,
- Automatic fire-extinguishing systems,
- Standpipe systems, or
- Portable or fixed extinguishers.

Fire protection equipment required under this section shall be installed in

accordance with this code and the applicable referenced standards.

### 2015 INT'L RESIDENTIAL CODE

**AV107.1 Fire Sprinklers.** An approved automatic fire sprinkler system shall be installed in new one-family and two-family dwellings and townhouses in accordance with Appendix Q.

**AV107.2 Fire Sprinklers in Existing Buildings.** An approved automatic fire sprinkler system shall be installed throughout the residence in existing one-family and two-family dwellings (and townhouses) in accordance with Appendix Q when undergoing a remodel or addition when the construction value of all additions, alterations or repairs performed within

a sixty-month period exceeds 50% of the value of the residence. Value shall be determined by a method approved by the fire code official.

**AV107.3 Household Fire Alarm System.** An approved household fire alarm system shall be installed throughout the residence in existing one-family and two-family dwellings (and townhouses) that have deficiencies in fire flow, hydrants or access. This system shall be installed in accordance with NFPA 72 Chapter 29 when undergoing a remodel or addition when the construction value of all additions, alterations or repairs performed within a sixty-month period is within 10% to 50% of the value of the residence. Value shall be determined by a method approved by the fire code official.





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## Auto Security Gates

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*Gates securing the fire apparatus access roads shall comply with all the following criteria:*

### **105.7.9 Gates and barricades across fire apparatus access roads. 2015 IFC**

A construction permit is required for the installation of or modification to a gate or barricade across a fire apparatus access road.

### **D103.5 Fire apparatus access road gates. 2015 IFC**

Gates securing the fire apparatus access roads shall comply with all the following criteria:

1. Where a single gate is provided, the gate width shall be not less than 20 feet (6096 mm). Where a fire apparatus road consists of a divided roadway, the gate width shall be not less than 12 feet (3658 mm). *A gate less than 20-feet in width may be approved if only serving a single residence, provided it is protected by a fire sprinkler system or additional Fire Protection measures are added.*
2. Gates shall be of the swinging or sliding type.
3. Gates located on a main arterial shall have provisions for fire apparatus to pull completely off the roadway. Gates shall be set back at least 30 feet from roadway.
4. Construction of gates shall be of materials that allow manual operation by one person.
5. Gate components shall always be maintained in an operative condition and replaced or repaired when defective.
6. Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be approved by the fire code official. *A Knox Key Switch, Knox Box, or Click 2 Enter system is required.*
7. Methods of locking shall be submitted for approval by the fire code official.
8. Electric gate operators, where provided, shall be listed in accordance with UL 325.
9. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F2200

## **Submit Plans and Specification Sheets for Permit Review**

1. Two sets of construction documents and supporting data shall be submitted.  
105.4.1
2. Construction documents shall be drawn to scale and may be provided in paper format or using electronic media. *For more information on electronic plan submittal visit <http://www.mercergov.org/Page.asp?NavID=2619>.*
3. Plans shall clearly show gate location, driveway paved area all the way to the access road, access easement width if applicable, control pedestal, and any access obstructions in the area.

## **Permit Review and Inspection**

The target Fire Review date for Auto Security Gates is 3 weeks. Two inspections will be performed. A City of Mercer Island electrical inspector will conduct an electrical safety inspection. A Mercer Island Fire Department inspector will perform the final inspection including the Knox Box/Switch or Click 2 Enter.

To request your **electrical** inspection use the Inspection Request Line or [mybuildingpermit.com](http://mybuildingpermit.com).

To request your Fire Department inspection use either the Inspection Request Line or [mybuildingpermit.com](http://mybuildingpermit.com) **AND** schedule the date and time at 206-275-7966. Please allow 48 hours notice for your Fire Department Inspection.

## **Click 2 Enter vs Knox Box/Key Switch**

Click 2 Enter uses a radio frequency device to provide emergency access. This provides access to all authorized fire and police agencies in the event of an emergency. Knox access is only available to the Mercer Island Fire Department. We very strongly recommend the use of Click 2 Enter since it also provides access to police and other responding Fire Departments.