

Tualatin Valley Fire & Rescue



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 in all areas served by Tualatin Valley Fire & Rescue.

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AUTHORITY AND SCOPE

Tualatin Valley Fire & Rescue is an exempt jurisdiction and has elected to administer and enforce the Oregon Fire Code under the authority granted to us by ORS 476.030. The current Oregon Fire Code is the 2019 Oregon Fire Code. This is based on the International Fire Code, 2018 Edition, as published and copyrighted by the International Code Council, which has been amended and adopted by the Oregon State Fire Marshal's Office. In order to further the Oregon State Fire Marshal's goal of promoting fire code consistency throughout the state, Tualatin Valley Fire & Rescue enforces the Oregon Fire Code through local adoption (TVF&R Ordinance #2020-01).

Tualatin Valley Fire & Rescue has prepared this guide to provide good faith guidance to building officials, contractors, business owners, the public, and fire marshals on local interpretations and practices that are considered to be in compliance with the Oregon Fire Code. The intent is to clarify aspects of the code that are vague or non-specific by addressing selected issues under normal conditions. This guide does not create or replace code provisions. The reader is cautioned that the guidance detailed in this guide may or may not apply to their specific situation, and that Tualatin Valley Fire & Rescue retains final authority to determine compliance with the adopted code.

LOCAL DEVELOPMENT CODES

Check the local city or county development code to determine public roadway standards.

HELPFUL LINKS:

2019 Oregon Fire Code:

<https://codes.iccsafe.org/content/OFC2019P1>

Oregon Building Code (Oregon Structural Specialty Code):

<https://codes.iccsafe.org/content/OSSC2019P1/to>

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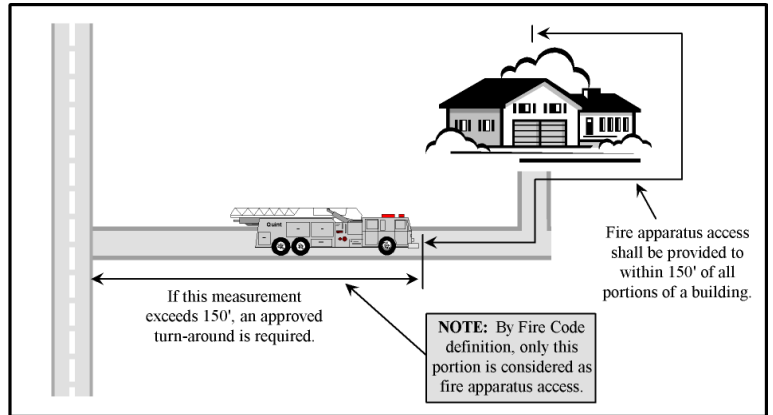
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Fire Apparatus Access

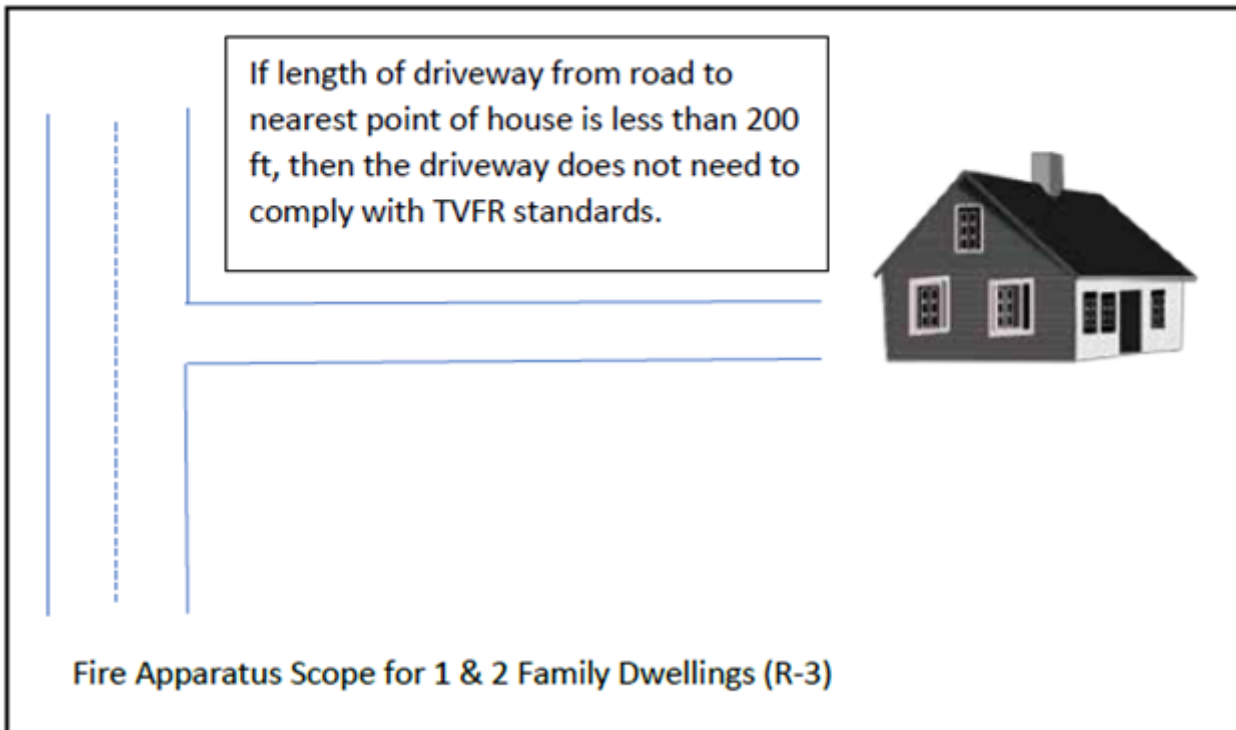
FIRE APPARATUS ACCESS ROAD DISTANCE FROM BUILDINGS AND FACILITIES: Access

roads shall be within 150' 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'. (OFC 503.1.1)

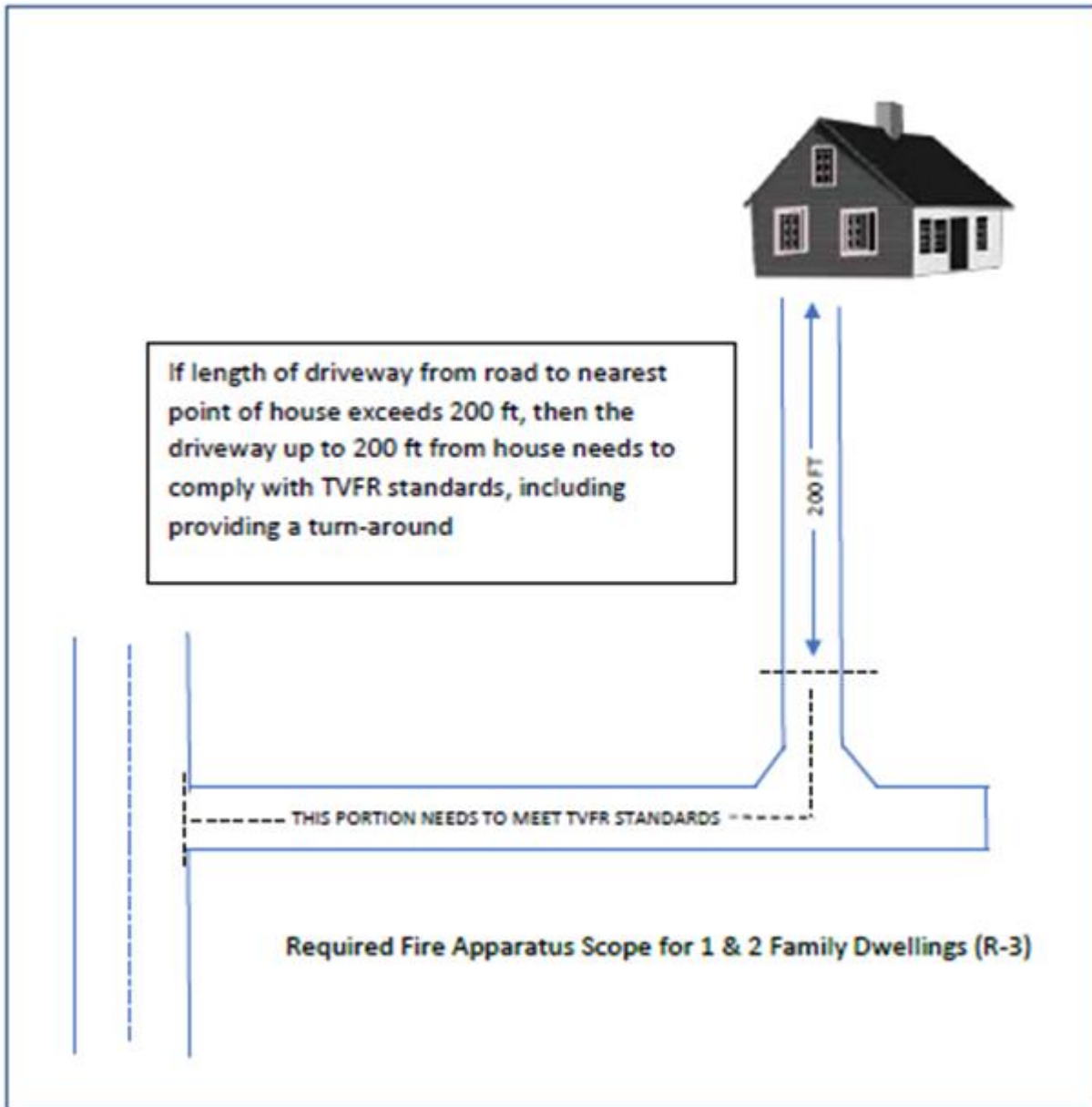


Alternatively, in accordance with OFC 503.1.1 Exception 1.3, you may simply allow distance of 200' to the nearest point on the house. See attached diagram:

The 200' allowance is primarily for determining if any portion of a driveway needs to be reviewed or comply with TVF&R standards. If the nearest portion of a house is less than 200' from the road, then there is no need for TVF&R to review the driveway. TVF&R requirements (width, grade, support, etc.) will not apply to driveways less than 200' to nearest portion of house per the following diagram:



If the driveway exceeds 200', then the 200' allowance is used to determine which portion of the driveway needs to comply. It inherently also means that a turn-around would be required (since turn-around is required at 200' length also). This is similar to the 150' rule, except the 150' rule requires measurement to the furthest portion of the house around an accessible route which often is not known at time of land use, or is built on a slope which we don't know what an accessible path is until landscaping is completed. The 200' allowance provides a much easier measurement to the nearest portion of the house. The following diagram clarifies:



These measurements apply ONLY to one and two-family dwellings.

FIRE APPARATUS ACCESS ROAD EXCEPTION FOR AUTOMATIC SPRINKLER PROTECTION: When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access may be modified as approved by the Fire Marshal. (OFC 503.1.1) **Note: If fire sprinklers are installed and the system will be supported by a municipal water supply, please contact the local water purveyor for information about water meter sizing.**

FIRE APPARATUS ACCESS ROAD WIDTH AND VERTICAL CLEARANCE: Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20' (26' adjacent to fire hydrants (OFC D103.1)) and an unobstructed vertical clearance of not less than 13' 6". (OFC 503.2.1 & D103.1)

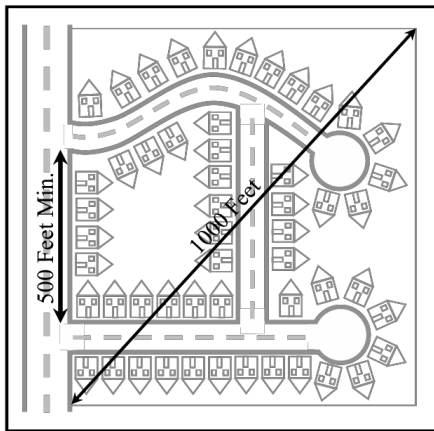
FIRE APPARATUS ACCESS ROADS FOR INDIVIDUAL ONE AND TWO FAMILY DWELLINGS AND ACCESSORY STRUCTURES: The fire district will approve access roads of 12' for up to three dwelling units (Group R-3) and accessory (Group U) buildings. (OFC 503.1.1)

FIRE APPARATUS ACCESS ROADS FOR AGRICULTURAL/EQUINE EXEMPT STRUCTURES: Agricultural buildings and equine facilities, as defined in ORS 455.315, shall be exempt from the fire apparatus access requirements contained in Tualatin Valley Fire & Rescue's adopted fire prevention ordinance. (See Appendix B)

FIRE APPARATUS ACCESS ROADS FOR FOREST DWELLINGS: Approved Forest Dwelling Permit Applications (where the County Zoning and Development tests are completed and approved, and where the structure meets all County forest dwelling fire siting, fire retardant roof, and spark arrestor requirements) will be allowed up to 20% maximum grade. Access roads greater than 20% shall be considered on a case-by-case basis. Forest Dwelling access roads shall be an all-weather surface capable of supporting imposed loads of not less than 37,000 pounds gross vehicle weight and be no less than 12' minimum width. All other access requirements, including turn- arounds shall be determined based upon heavy brush unit response capability to the individual property.

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 30 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. (OFC D107)

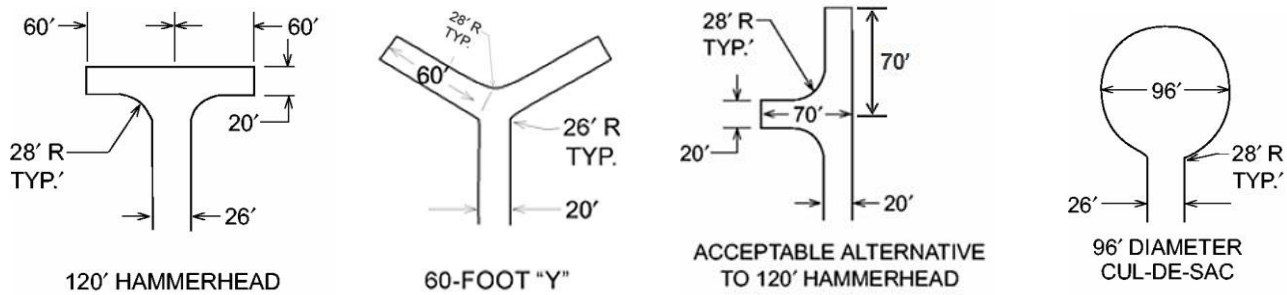
MULTIPLE ACCESS ROADS SEPARATION: Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the area to be served (as identified by the Fire Marshal), measured in a straight line between accesses. (OFC D104.3)



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 4 inches high with a minimum stroke width of 1/2 inch. (OFC 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. (OFC 3309 and 3310.1)

DEAD END ROADS AND TURNAROUNDS: Dead end fire apparatus access roads in excess of 150' in length shall be provided with an approved turnaround. Diagrams of approved turnarounds are shown below: (OFC 503.2.5 & D103.



TURNING RADIUS: The inside turning radius and outside turning radius shall not be less than 28' and 48' respectively, measured from the same center point. (OFC 503.2.4 & D103.3)

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

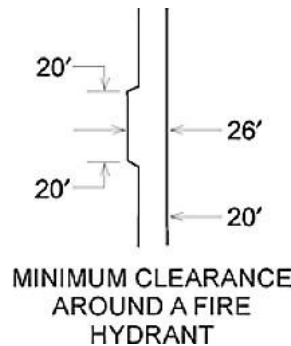
ACCESS ROAD GRADE: Fire apparatus access roadway grades shall not exceed 15%.

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. (OFC 503.2.7 & D103.2)

ANGLE OF APPROACH/GRADE FOR INTERSECTIONS: Intersections shall be level (maximum 5%). (OFC 503.2.7 & D103.2)

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' and shall extend 20' before and after the point of the hydrant. (OFC D103.1)



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. (OFC 503.2.3)

BRIDGES: Private bridges shall be designed and constructed in accordance with the State of Oregon Department of Transportation and American Association of State Highway and Transportation Officials Standards *Standard Specification for Highway Bridges (HB17)*. A building permit shall be obtained for the construction of the bridge if required by the building official of the jurisdiction where the bridge is to be built. 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 district 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. (OFC 503.2.6)

GATES: Gates securing fire apparatus roads shall comply with all of the following (OFC D103.5, and 503.6):

1. Minimum unobstructed width shall be not less than 20' (or the required roadway surface width)
2. Gates serving three or less single-family dwellings shall be a minimum of 12' in width.
3. Gates shall be set back at minimum of 30' from the intersecting roadway or as approved.
4. Electric gates shall be equipped with a means for operation by fire department personnel
5. Electric automatic gates shall comply with ASTM F 2200 and UL 325.
6. When the access gate needs to be locked an expendable long shank padlock which can be cut off with a bolt cutter shall be installed. A knox padlock is not required.

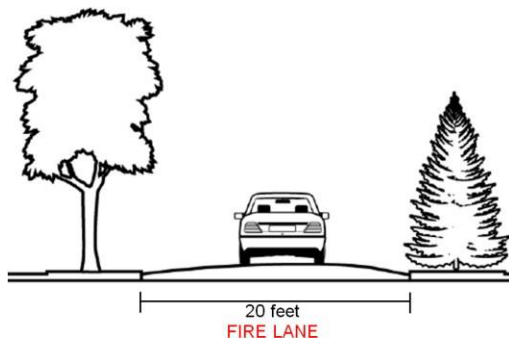
TRAFFIC CALMING DEVICES: Shall be prohibited on fire access routes unless approved by the Fire Marshal. (OFC 503.4.1) Traffic calming measures linked here: <http://www.tvfr.com/DocumentCenter/View/1578>

NO PARKING: Parking on emergency access roads shall be as follows (OFC D103.6.1-2):

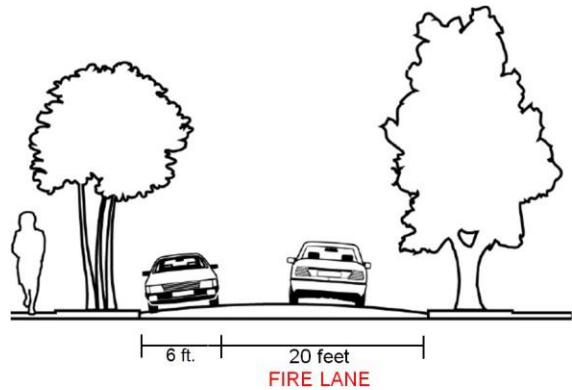
1. 20-26' road width – no parking on either side of roadway
2. 26-32' road width – parking is allowed on one side
3. Greater than 32' road width – parking is not restricted

Note: For specific widths and parking allowances, contact the local municipality.

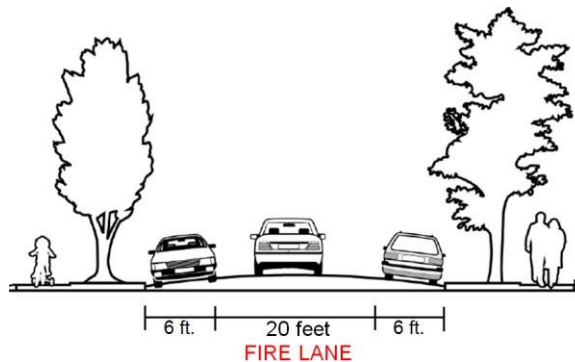
Parking prohibited on either side:



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' 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'. Signs shall be 12 inches wide by 18 inches high and shall have red letters on a white reflective background. (OFC 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' 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). (OFC 503.3)

Building Access and Fire Service Features

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.tvfr.com or contact TVF&R for assistance and instructions regarding installation and placement. (OFC 506.1)

Firefighting Water Supplies

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 1,000 gallons per minute. If the structure(s) is (are) 3,600 sq ft or larger, the required fire flow shall be determined according to OFC Appendix B. (OFC B105.2)

RURAL ONE- AND TWO- FAMILY DWELLINGS: Rural one- or two-family dwellings, where there is no fixed and reliable water supply and where there is approved access shall not be required to provide a firefighting water supply. (OFC B103)

AGRICULTURAL/EQUINE EXEMPT STRUCTURES: Agricultural buildings and equine facilities, as defined in ORS 455.315, shall be exempt from the firefighting water supply requirements contained in Tualatin Valley Fire & Rescue's adopted fire prevention ordinance. (See Appendix B)

ACCESSORY STRUCTURES: Detached U occupancies, that are in excess of 3,600 sq ft, are not required to have a water supply when they are accessory to a single family dwelling and have approved fire department access.

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' for commercial projects, or 600' 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. (OFC Appendix B)

WATER SUPPLY DURING CONSTRUCTION IN MUNICIPAL AREAS: 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. (OFC 3312.1)

Fire Hydrants

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 Table C 105.1. (OFC Appendix C)

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

FIRE-FLOW REQUIREMENT (gpm)	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS ^{a,b,c} (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT ^d
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 ^e	200	120

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

- a. Reduce by 100' 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' 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' 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' to provide for transportation hazards.
- d. Reduce by 50' for dead-end streets or roads.
- e. One hydrant for each 1,000 gallons per minute or fraction thereof.

FIRE HYDRANT(S) PLACEMENT: (OFC C104)

- Existing hydrants in the area may be used to meet the required number of hydrants as approved. Hydrants that are up to 600' away from the nearest point of a subject building that is protected with fire sprinklers may contribute to the required number of hydrants. (OFC 507.5.1)
- Hydrants that are separated from the subject building by railroad tracks shall not contribute to the required number of hydrants unless approved by the Fire Marshal.
- 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' from an approved fire apparatus access roadway unless approved by the Fire Marshal. (OFC C102.1)

FIRE HYDRANTS – ONE- AND TWO-FAMILY DWELLINGS AND ACCESSORY STRUCTURES: Where a portion of a structure is more than 600' 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 and mains shall be provided. (OFC 507.5.1)

PRIVATE FIRE HYDRANT IDENTIFICATION: Private fire hydrants shall be painted red in color. Exception: Private fire hydrants within the City of Tualatin shall be yellow in color. (OFC 507)

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. (OFC 507)

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. (OFC 507.5.6 & OFC 312)

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

Appendix

Appendix A – Key Boxes

Appendix B – Agricultural Building and Equine Facility Exemption

Appendix C – No Parking Fire Lane Curb Detail

Appendix D – Mountable Curb Detail

Appendix E – Fire Department Access Box for Override Switch on Powered Access Gates



New Construction Fire Code Application Guide Appendix A

KEY BOXES

DATE: June 1, 2010

(Reviewed: June 1, 2020)

PURPOSE: To define the requirements for installation of key boxes.

SCOPE: This policy shall apply to all areas served by Tualatin Valley Fire & Rescue.

CODE REFERENCES: 2019 OFC Section 506

POLICY: Key Boxes

Tualatin Valley Fire & Rescue requires key boxes on buildings that meet certain parameters. When key boxes are required by this policy, Knox brand key boxes shall be used.

Required Installation - Key boxes shall be installed on buildings and structures when:

- ✓ An elevator is installed.
- ✓ Equipped with a fire alarm system.
- ✓ Equipped with an automatic fire extinguishing system.
- ✓ Access is restricted due to security arrangements.

EXCEPTION: Buildings and structures open and supervised twenty-four hours a day, seven days a week or constantly attended.

Installation Details - Key boxes shall be installed in an approved location; normally adjacent to primary entrance. The bottom of the key box shall not be more than 6' above the walking surface unless approved by the Chief or authorized representative. See exception below.

EXCEPTION: In multi-tenant buildings (each with their own outside entrance) the key box shall be located at the door that will best and most easily gain access to automatic sprinkler system controls alarm system controls, etc.

Contents - Key boxes typically may contain the following keys and critical information necessary to gain access:

- ✓ Building or structure keys
- ✓ Alarm systems keys and instructions
- ✓ Elevator recall key
- ✓ Emergency personnel contact numbers
- ✓ Multiple sets of keys when required
- ✓ Gate key
- ✓ Elevator door key
- ✓ Automatic fire extinguishing system control valve keys
- ✓ Hazardous materials safety data sheets

Required Labeling - All keys shall be labeled as to their use, i.e., main entrance, alarm control panel, sprinkler room door, etc.

Key Box Size - The size of the key box shall be sufficient to contain all necessary keys and/or equipment.



New Construction Fire Code Application Guide

Appendix B

AGRICULTURAL BUILDING AND EQUINE FACILITY EXEMPTION

DATE: June 1, 2010

(Reviewed: June 1, 2020)

PURPOSE: To define the requirements for access and firefighting water supplies for exempt agricultural buildings and equine facilities.

SCOPE: This policy shall apply to all areas served by Tualatin Valley Fire & Rescue.

CODE REFERENCES: Oregon Revised Statute 455.315

POLICY: Agricultural Building and Equine Facility Exemption

For the purposes of this policy, fire apparatus access and firefighting water supplies for agricultural buildings and equine facilities, as defined in ORS 455.315, shall be as follows:

1. Agricultural buildings and equine facilities, as defined in ORS 455.315, shall be exempt from the fire apparatus access and firefighting water supply requirements contained in Tualatin Valley Fire & Rescue's adopted fire prevention ordinance.
2. It shall be the policy of Tualatin Valley Fire & Rescue to encourage the installation of fire sprinkler systems in agricultural buildings and equine facilities.
3. It shall be the policy of Tualatin Valley Fire & Rescue to encourage the installation of fire apparatus access roadways and firefighting water supplies.



New Construction Fire Code Application Guide Appendix C

NO PARKING FIRE LANE CURB DETAIL

DATE: April 10, 2020

(Revised: June 1, 2020)

PURPOSE: To define the requirements of marking fire lane curbing.

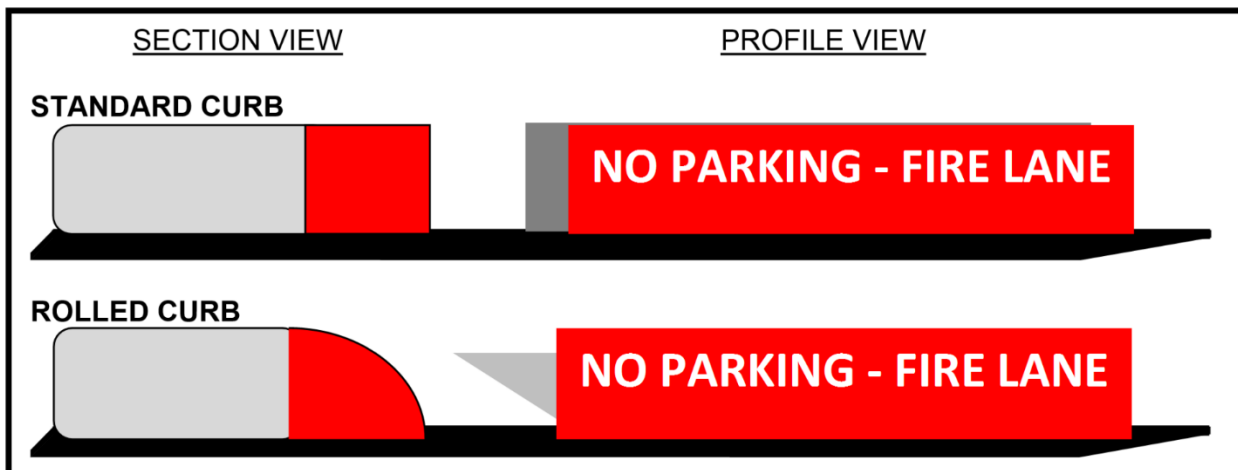
SCOPE: This policy shall apply to all areas served by Tualatin Valley Fire & Rescue.

CODE REFERENCES: 2018 OFC Chapter 5, Section 503.3

POLICY: No Parking Fire Lane Curb Detail

The OFC does not provide guidance with regards to the color or marking style of fire lane curbing. The policy of Tualatin Valley Fire & Rescue is as follows:

- Curb paint shall be red for the entire length of the fire lane.
- “NO PARKING FIRE LANE” shall be stenciled with a 3 ½ inch minimum height block in white lettering with a minimum of ½ inch stroke width.
- The markings shall be spaced at 25’ intervals.



MOUNTABLE CURB DETAIL

DATE: April 10, 2020

(Revised: June 1, 2020)

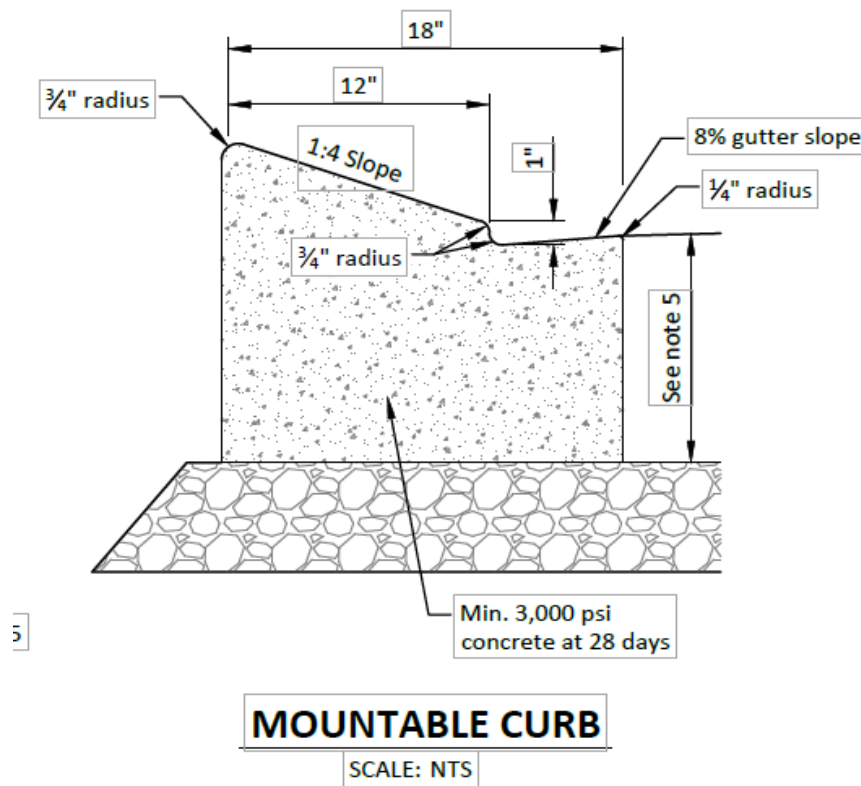
PURPOSE: To define the requirements of a mountable curb for fire access.

SCOPE: This policy shall apply to all areas served by Tualatin Valley Fire & Rescue.

CODE REFERENCES: 2018 OFC Chapter 5, Section 503.2.8

POLICY: Mountable Curb Detail

The OFC does not provide guidance with regards to the use of mountable curbs for fire access roads. Mountable curbs will be approved on a case by case basis. Where a local jurisdiction has a design detail that meets or exceeds this detail the detail of the local jurisdiction shall apply. The policy of Tualatin Valley Fire & Rescue is as follows:



NOTES:

1. Expansion joints shall be provided at each point of tangency of the curb material. Joints shall be pre-molded, non-extruding, with a minimum thickness of 1/2 inch.
2. Contraction joints shall be a minimum of 2" deep, spaced a maximum of 15' apart, and match PCC

street slab joints.

3. Base rock 1 ½" minus, compacted to 95% AASHTO T-180, shall be to subgrade of street structure or 4" in depth, whichever is greater, extending 1' behind curb.
4. Slope of gutter shall not exceed 5% at sidewalk ramp.
5. Gutter thickness shall match the pavement thickness, where thickness exceeds six inches.
6. The height of the standard curb shall match the pavement thickness plus the curb exposure when greater than 16".



New Construction Fire Code Application Guide

Appendix E

Fire Department Access Box for override switch on powered access gates

DATE: 4/16/2020

(Revised: June 1, 2020)

PURPOSE: To identify the requirements for fire department access box for override switch on powered access gates.

SCOPE: This policy shall apply to all areas served by Tualatin Valley Fire & Rescue.

CODE REFERENCES: 503.6 OFC 2019

POLICY: Fire Department Access Box/override switch for powered gates.

Power operated gates shall be equipped with a Fire Department approved security gate override device per the following language:

SECURITY GATE OVERRIDE DEVICE REQUIREMENTS

The override device shall consist of the following:

1. **FIRE DEPARTMENT ACCESS BOX**
A weatherproof metal box approximately 6 inches wide by 7 inches high. The front of the box shall consist of a hinged metal door with hasp for a padlock. The door shall be locked with an expendable long shank padlock which can be cut off with a bolt cutter. The access box shall be approved by TVF&R prior to installation.
2. **PLACEMENT OF FIRE DEPARTMENT ACCESS BOX**
The box shall be installed on a gate support pillar or post adjacent to the gate. The box must be visible to anyone approaching the gate at all times.
3. **OVERRIDE OPERATION**
Mounted within the box shall be a micro switch. When the door of the access box is opened the micro switch shall activate the gate. When the switch is in the override position, the gate or gates shall open and remain open until the access door is closed and the micro switch is placed back in position for normal operation.
4. **TIMING OF OVERRIDE OPERATION**
When the switch is moved to the override position, the gate/gates shall fully open within 10 seconds.