

Tualatin Valley Fire & Rescue



New Construction Fire Code Applications Guide for Commercial and Multi-Family 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 Oregon Fire Code is the International Fire Code, 2012 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 #14-02).

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.

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

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

DISPUTE RESOLUTION PROCESS

Any person seeking an adjustment or variance to the Fire Code, or who believes they have been adversely affected by an action of the District or its officers in interpreting or enforcing the Fire Code, may file an appeal.

HELPFUL LINKS:

Oregon Fire Code:

http://ecodes.biz/ecodes_support/free_resources/Oregon/14_Fire/14_ORFire_main.html

Oregon Building Code (Oregon Structural Specialty Code):

http://ecodes.biz/ecodes_support/free_resources/Oregon/14_Structural/14_ORStructural_main.html

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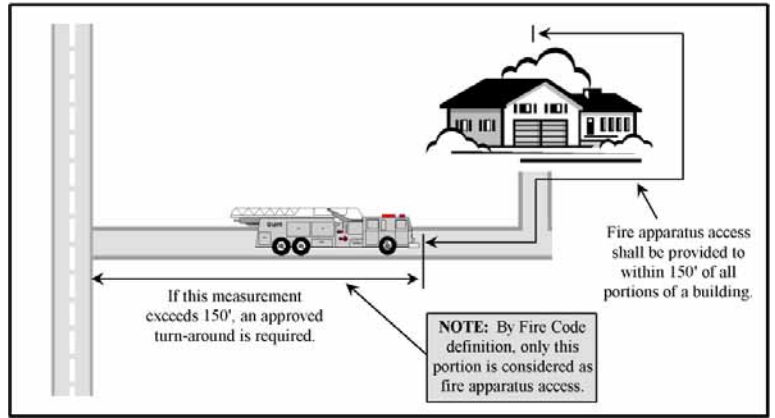
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Fire Apparatus Access

FIRE APPARATUS ACCESS ROADS: Access roads shall be provided for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction.

- **Exception:** Approved agricultural and equine structures complying with ORS 455.315 are not required to have fire apparatus access roads. (See Appendix C)

Access roads for additions to existing commercial structures may be modified by the fire official in accordance with OFC 104.8 and OFC 503.1.1 to account for the pre-existing conditions.



Access roads are not required to be modified for commercial buildings that undergo a change in occupancy, change in use, or conversion from agricultural or equine exempt to non-exempt unless there is a change to the structure's square footage or building footprint. (OFC 503.1.1)

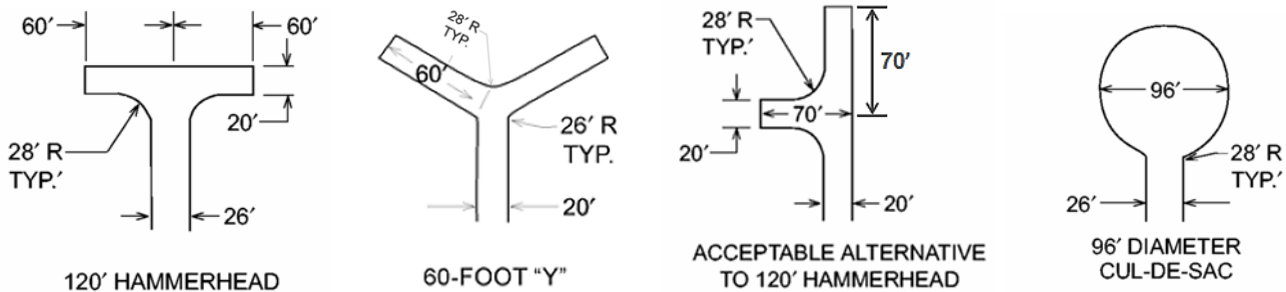
FIRE ACCESS ROADS FOR NON-BUILDING FACILITIES: Fire apparatus access is required for uses at fixed locations that are deemed as being a "facility" by the Fire Marshal. A "facility" includes exterior storage, processing or filling areas for flammable and combustible substances and hazardous materials; piers and wharves; recreational vehicle, mobile home and manufactured housing parks, sales and storage lots; permanent outdoor assembly venues for gatherings exceeding 1,000 persons; and similar uses. Access to facilities may be modified by the Fire Marshal in accordance with OFC 104.8 based on the specific use, frequency, location and other site conditions. (OFC 503.1.1)

FIRE ACCESS ROAD DISTANCE FROM BUILDINGS: The access shall extend to 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. (OFC 503.1.1)

FIRE ACCESS ROAD EXCEPTIONS: The requirements for fire apparatus access may be modified as approved by the Fire Marshal where any of the following apply: (OFC 503.1.1 Exception)

- 1) Buildings are equipped throughout with an approved automatic fire sprinkler system (the approval of this alternate method of construction shall be accomplished in accordance with the provisions of ORS 455.610(5)).
- 2) Fire apparatus access roads cannot be installed because of location on property, topography, waterways, non-negotiable grades, or other similar conditions, and an approved alternative means of fire protection is provided.

DEAD ENDS AND ROADS IN EXCESS OF 150 FEET (TURNAROUNDS): Dead end fire apparatus access roads or roads in excess of 150 feet in length shall be provided with an approved turnaround. Diagrams of approved turnarounds are shown below: (OFC 503.2.5 & Figure D103.1)



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)

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. (OFC 503.2.4 & D103.3)

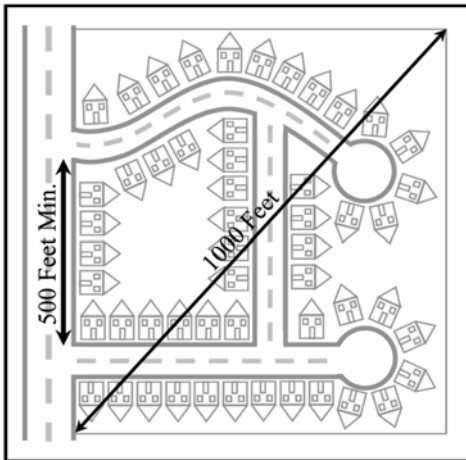
TURNOUTS: Where access roads are less than 20 feet and exceed 400 feet in length, turnouts 10 feet wide and 30 feet long may be required and will be determined on a case by case basis. (OFC 503.2.2)

ADDITIONAL ACCESS ROADS – COMMERCIAL/INDUSTRIAL HEIGHT: Buildings exceeding 30 feet in height or three stories in height shall have at least two separate means of fire apparatus access. (D104.1)

ADDITIONAL ACCESS ROADS – COMMERCIAL/INDUSTRIAL SQUARE FOOTAGE: Buildings or facilities having a gross building area of more than 62,000 square feet shall have at least two approved separate means of fire apparatus access. Exception: Projects having a gross building area of up to 124,000 square feet that have a single approved fire apparatus access road when all buildings are equipped throughout with approved automatic sprinkler systems. (OFC D104.2)

ADDITIONAL ACCESS ROADS – MULTI-FAMILY RESIDENTIAL DEVELOPMENTS: Projects having more than 100 dwelling units shall be provided with two separate and approved fire apparatus access roads. Exception: Projects having up to 200 dwelling units may have a single approved fire apparatus access road when all buildings, including nonresidential occupancies, are equipped throughout with an approved automatic sprinkler system in accordance with section 903.3.1.1, 903.3.1.2. Projects having more than 200 dwelling units shall be provided with two separate and approved fire apparatus roads regardless of whether they are equipped with an approved automatic sprinkler system. (OFC D106)

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)



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

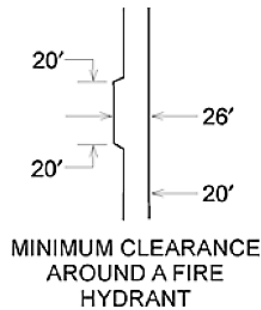
ANGLE OF APPROACH/GRADE FOR TURNAROUNDS: Turnarounds shall be as flat as possible and have a maximum of 5% grade with the exception of crowning for water run-off. (OFC 503.2.7 & D103.2)

ANGLE OF APPROACH/GRADE FOR INTERSECTIONS: Intersections shall be level (maximum 5%) with the exception of crowning for water run-off. (OFC 503.2.7 & D103.2)

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%.

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) and an unobstructed vertical clearance of not less than 13 feet 6 inches. (OFC 503.2.1 & D103.1)

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. (OFC Figure D103.1)



AERIAL FIRE APPARATUS ROADS: Buildings with a vertical distance between the grade plane and the highest roof surface that exceeds 30 feet in height shall be provided with a fire apparatus access road constructed for use by aerial apparatus with an unobstructed driving surface width of not less than 26 feet. For the purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of the parapet walls, whichever is greater. Any portion of the building may be used for this measurement, provided that it is accessible to firefighters and is capable of supporting ground ladder placement. (OFC D105.1, D105.2)

AERIAL APPARATUS OPERATIONS: At least one of the required aerial access routes shall be located within a minimum of 15 feet and a maximum of 30 feet from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial access road is positioned shall be approved by the Fire Marshal. Overhead utility and power lines shall not be located over the aerial access road or between the aerial access road and the building. (D105.3, D105.4)

SURFACE AND LOAD CAPACITIES: Fire apparatus access roads shall be of an all-weather surface that is easily distinguishable from the surrounding area and is capable of supporting not less than 12,500 pounds point load (wheel load) and 75,000 pounds live load (gross vehicle weight). Documentation from a registered engineer that the final construction is in accordance with approved plans or the requirements of the Fire Code may be requested. (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*. 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 feet (or the required roadway surface width)
2. Gates shall be set back at minimum of 30 feet from the intersecting roadway or as approved.
3. Electric gates shall be equipped with a means for operation by fire department personnel
4. Electric automatic gates shall comply with ASTM F 2200 and UL 325.

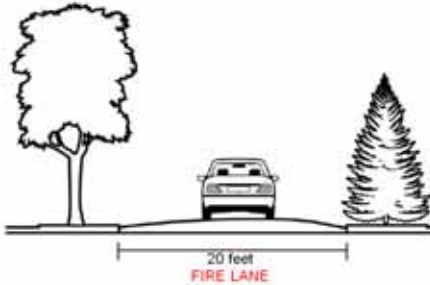
TRAFFIC CALMING DEVICES: Shall be prohibited on fire access routes unless approved by the Fire Marshal. (OFC 503.4.1) Traffic calming measures linked here: <http://www.tvfr.com/DocumentCenter/View/1578>

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

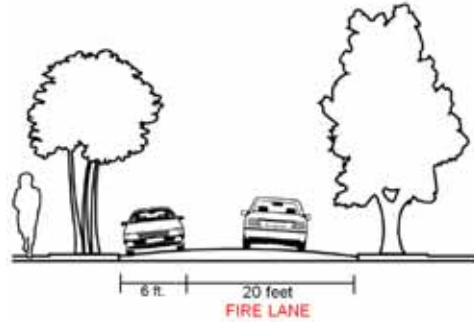
1. 20-26 feet road width – no parking on either side of roadway
2. 26-32 feet road width – parking is allowed on one side
3. Greater than 32 feet road width – parking is not restricted

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

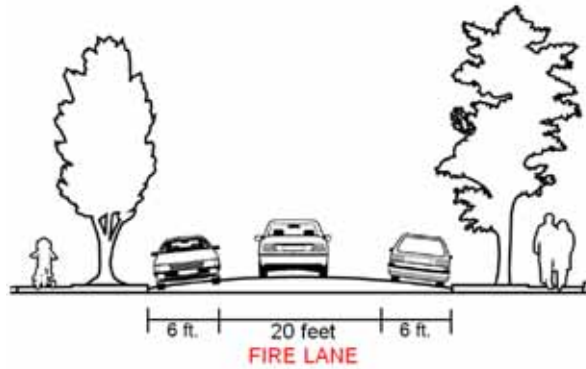
Parking prohibited on either side:



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 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. (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 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). (OFC 503.3)

Building Access and Fire Service Features

KNOX BOX: A Knox Box for building access may be required for structures and gates. See Appendix B 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)

FIRE PROTECTION EQUIPMENT IDENTIFICATION: Rooms containing controls to fire suppression and detection equipment shall be identified as "Fire Control Room." Signage shall have letters with a minimum of 4 inches high with a minimum stroke width of 1/2 inch, and be plainly legible, and contrast with its background. (OFC 509.1)

FIRE ALARM VERIFICATION: Supervisory Stations shall not retransmit alarm signals to Public Fire Service Dispatch and Communication Centers until an attempt is made to verify the accuracy of the alarm signal at the protected premise. The verification attempt shall be made within 90 seconds of the receipt of the alarm signal. If the protected premise is contacted and can confirm that no fire or emergency condition exists, then the alarm signal shall not be retransmitted. In all other situations, the alarm signal shall be retransmitted immediately. (OFC 907.7.6)

- **Exception:** Water flow and manual pull station alarms shall be immediately retransmitted without verification.

EMERGENCY RESPONDER RADIO COVERAGE: The Oregon Fire Code (OFC) requires that certain newly constructed buildings have approved levels of emergency radio signal strength per OFC 510.2 (relative to existing levels of public radio coverage available at the exterior). Where the design of the building reduces the level of coverage inside of the building below minimum performance levels, a distributed antenna system, signal booster, or other method approved by TVF&R and Washington County Consolidated Communications Agency shall be provided. See Appendix F for further information and detail. (OFC 510)

Firefighting Water Supplies

COMMERCIAL BUILDINGS – REQUIRED FIRE FLOW: The minimum fire flow and flow duration shall be determined in accordance with OFC Table B105.2. The required fire flow for a building shall not exceed the available GPM in the water delivery system at 20 psi. (OFC B105.3)

Note: OFC B106, Limiting Fire-Flow is also enforced, except for the following:

- The maximum needed fire flow shall be 3,000 GPM at 20 psi.
- Tualatin Valley Fire & Rescue does not adopt Occupancy Hazards Modifiers in section B105.4-B105.4.1

**TABLE B105.2
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS**

| FIRE-FLOW CALCULATION AREA (square feet) | | | | | FIRE-FLOW (gallons per minute) ^a | FLOW DURATION (hours) |
|--|--------------------------------|------------------------------|--------------------------------|-----------------------|--|--------------------------|
| Type IA and IB ^a | Type IIA and IIIA ^a | Type IV and V-A ^a | Type IIB and IIIB ^a | Type V-B ^a | | |
| 0-22,700 | 0-12,700 | 0-8,200 | 0-5,900 | 0-3,600 | 1,500 | 2 |
| 22,701-30,200 | 12,701-17,000 | 8,201-10,900 | 5,901-7,900 | 3,601-4,800 | 1,750 | |
| 30,201-38,700 | 17,001-21,800 | 10,901-12,900 | 7,901-9,800 | 4,801-6,200 | 2,000 | |
| 38,701-48,300 | 21,801-24,200 | 12,901-17,400 | 9,801-12,600 | 6,201-7,700 | 2,250 | |
| 48,301-59,000 | 24,201-33,200 | 17,401-21,300 | 12,601-15,400 | 7,701-9,400 | 2,500 | |
| 59,001-70,900 | 33,201-39,700 | 21,301-25,500 | 15,401-18,400 | 9,401-11,300 | 2,750 | 3 |
| 70,901-83,700 | 39,701-47,100 | 25,501-30,100 | 18,401-21,800 | 11,301-13,400 | 3,000 | |
| 83,701-97,700 | 47,101-54,900 | 30,101-35,200 | 21,801-25,900 | 13,401-15,600 | 3,250 | |
| 97,701-112,700 | 54,901-63,400 | 35,201-40,600 | 25,901-29,300 | 15,601-18,000 | 3,500 | |
| 112,701-128,700 | 63,401-72,400 | 40,601-46,400 | 29,301-33,500 | 18,001-20,600 | 3,750 | |
| 128,701-145,900 | 72,401-82,100 | 46,401-52,500 | 33,501-37,900 | 20,601-23,300 | 4,000 | 4 |
| 145,901-164,200 | 82,101-92,400 | 52,501-59,100 | 37,901-42,700 | 23,301-26,300 | 4,250 | |
| 164,201-183,400 | 92,401-103,100 | 59,101-66,000 | 42,701-47,700 | 26,301-29,300 | 4,500 | |
| 183,401-203,700 | 103,101-114,600 | 66,001-73,300 | 47,701-53,000 | 29,301-32,600 | 4,750 | |
| 203,701-225,200 | 114,601-126,700 | 73,301-81,100 | 53,001-58,600 | 32,601-36,000 | 5,000 | |
| 225,201-247,700 | 126,701-139,400 | 81,101-89,200 | 58,601-65,400 | 36,001-39,600 | 5,250 | 4 |
| 247,701-271,200 | 139,401-152,600 | 89,201-97,700 | 65,401-70,600 | 39,601-43,400 | 5,500 | |
| 271,201-295,900 | 152,601-166,500 | 97,701-106,500 | 70,601-77,000 | 43,401-47,400 | 5,750 | |
| 295,901-Greater | 166,501-Greater | 106,501-115,800 | 77,001-83,700 | 47,401-51,500 | 6,000 | |
| — | — | 115,801-125,500 | 83,701-90,600 | 51,501-55,700 | 6,250 | |
| — | — | 125,501-135,500 | 90,601-97,900 | 55,701-60,200 | 6,500 | |
| — | — | 135,501-145,800 | 97,901-106,800 | 60,201-64,800 | 6,750 | |
| — | — | 145,801-156,700 | 106,801-113,200 | 64,801-69,600 | 7,000 | |
| — | — | 156,701-167,900 | 113,201-121,300 | 69,601-74,600 | 7,250 | |
| — | — | 167,901-179,400 | 121,301-129,600 | 74,601-79,800 | 7,500 | |
| — | — | 179,401-191,400 | 129,601-138,300 | 79,801-85,100 | 7,750 | |
| — | — | 191,401-Greater | 138,301-Greater | 85,101-Greater | 8,000 | |

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

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. (OFC Appendix B)

RURAL COMMERCIAL BUILDINGS - REQUIRED FIRE FLOW: Commercial structures in rural and suburban areas where adequate and reliable water supply systems DO NOT exist will require a firefighting water supply system sized in accordance with NFPA Standard 1142 (or an approved alternate) capable of delivering a minimum of 500 gpm at 20 psi through an approved fire hydrant in an approved location. (OFC 507, B103.2, and B105)

- **Exception:** Buildings less than 24,000 square feet do not require an onsite firefighting water supply. (OFC B103.1).

WATER SUPPLY DURING CONSTRUCTION: 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 HYDRANTS – COMMERCIAL BUILDINGS: Where a portion of the building is more than 400 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the building, on-site fire hydrants and mains shall be provided. (OFC 507.5.1)

- This distance may be increased to 600 feet for buildings equipped throughout with an approved automatic sprinkler system.
- The number and distribution of fire hydrants required for commercial structure(s) is based on Table C105.1, following any fire-flow reductions allowed by section B105.3.1. Additional fire hydrants may be required due to spacing and/or section 507.5.1 of the Oregon Fire Code.

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 |

Table Footnotes:

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

- Reduce by 100 feet for dead-end streets or roads.
- 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.
- 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.
- Reduce by 50 feet for dead-end streets or roads.
- 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 feet 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 feet from an approved fire apparatus access roadway unless approved by the Fire Marshal. (OFC C102.1)

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)

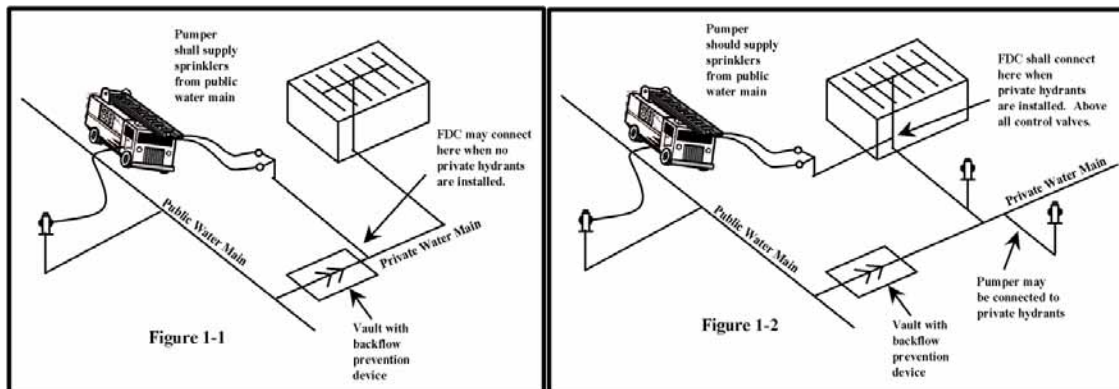
REFLECTIVE HYDRANT MARKERS: Fire hydrant locations shall be identified by the installation of blue reflective markers. They shall be located adjacent and to the side of the center line of the access roadway that the fire hydrant is located on. In the case that there is no center line, then assume a center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

FIRE DEPARTMENT CONNECTION (FDC) LOCATIONS: FDCs shall be located within 100 feet of a fire hydrant (or as approved). Hydrants and FDC's shall be located on the same side of the fire apparatus access roadway or drive aisle, fully visible, and recognizable from the street or nearest point of the fire department vehicle access or as otherwise approved. (OFC 912.2.1 & NFPA 13)

- Fire department connections (FDCs) shall normally be located remotely and outside of the fall-line of the building when required. FDCs may be mounted on the building they serve, when approved.
- FDCs shall be plumbed on the system side of the check valve when sprinklers are served by underground lines also serving private fire hydrants (as diagramed below).



Appendix

- A) Rural Water Supplies - Policy
- B) Key Boxes - Policy
- C) Agricultural Building and Equine Facility Exemption - Policy
- D) Fire Sprinkler Demand and Fire Flow – Policy
- E) Alternate Materials & Methods Requests – Guideline
- F) Emergency Responder Radio Coverage



New Construction Fire Code Application Guide Appendix A

COMMERCIAL RURAL WATER SUPPLIES

DATE: August, 2010

(Reviewed: 8/2/2018)

PURPOSE: To define the requirements for firefighting water supply for commercial occupancies in rural areas outside of adequate and reliable water systems.

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

CODE REFERENCES: 2014 OFC Chapter 5, Section 507; Appendix B, Sections B103 and B107

POLICY: Rural firefighting water supply volume will be established using NFPA 1142.

Tanks and supply systems for Private Water Supplies

Tanks to store firefighting water supplies will comply with NFPA Standard 22. Piping systems will comply with NFPA Standard 24. Fire pumps will comply with NFPA Standard 20.

Swimming pools, ponds, streams, lakes, rivers and similar open or seasonal water sources are not approved firefighting water supplies.

Pressurized or gravity fed systems shall provided that are capable of flowing a minium 500 gpm at 20 PSI residual, from an approved fire hydrant in an approved location.

Fire hydrants shall be equipped with one large diameter (4 ½ inch) port and two 2 ½ inch ports. The hydrant(s) shall be painted red to denote a private hydrant. Installation shall be installed in accordance with NFPA 24.

All rural water supplies will be fitted with a permanent sign of adequate lettering stating "Firefighting Water Supply" and shall include the number of gallons available. The sign will be mounted so that it is not less than 2 feet above the driving surface. The sign will be not less than 24 inches wide by 10 inches tall. The sign will be white background with black or red lettering. Lettering will be no less than 6 inches tall by ¾ inch wide stroke.

The center of the large diameter port on the fire hydrant shall be approximately 18 inches above the plane of the access roadway finished grade.

The fire hydrant shall be located no further than eight (8) feet from the approved fire department access road. A clear space of no less than 3 feet will be maintained around the hydrant so that it is in clear view and easily accessible for use. The driving surface leading to the hydrant will be kept clear at all times of all materials and vegetation.



New Construction Fire Code Application Guide

Appendix B

KEY BOXES

DATE: June, 2010

(Reviewed: 5/21/2014)

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: 2014 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 six feet (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 C

AGRICULTURAL BUILDING AND EQUINE FACILITY EXEMPTION

DATE: June, 2010

(Reviewed: 05/21/2014)

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 D

FIRE SPRINKLER DEMAND AND FIRE FLOW

DATE: June, 2010

(Revised: 05/21/2014)

PURPOSE: To define the requirements for calculating the fire flow for sprinkled buildings.

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

CODE REFERENCES: 2014 OFC Chapter 5, Section 507.3

POLICY: Sprinkler Demand and Fire Flow

The OFC does not provide guidance with regard to whether or not to add the fire sprinkler system demand to the required fire flow calculation. The policy of Tualatin Valley Fire & Rescue is as follows:

- Automatic Fire Sprinkler demand shall be added to the calculated fire flow.
- The sprinkler demand shall be added to the fire flow calculation after applying credits to fire flow. The resulting total demand may exceed 3,000 GPM. Verify water is available in supply system.
- Required number of fire hydrants shall be calculated based on the fire flow calculation prior to adding the sprinkler demand.
- Fire flow within buildings equipped with ESFR fire sprinkler systems may be adjusted upon a case-by-case evaluation of construction type, use, and occupancy, as well as other fire and life safety features.



New Construction Fire Code Application Guide

Appendix E

Guideline for Alternate Material and Methods Requests

PURPOSE: This guideline is intended to provide direction for submitting requests for use of alternate materials and methods (AM&Ms) in accordance with the 2014 Oregon Fire Code (OFC), section 104.9.

SCOPE: Requests for alternate materials and methods shall be evaluated by TVF&R staff to ensure the proposed design, use, or operation satisfactorily complies with the intent of the OFC and that the method of work performed or operation is, for the purpose intended, at least equivalent to that prescribed in the OFC in quality, strength, effectiveness, fire resistance, durability, or safety

CODE REFERENCES: 2014 OFC Chapter 1, Section 104.9

SUBMITTAL REQUIREMENTS

1. General Requirements

The applicant shall provide the following information, in writing, with the plans necessary to evaluate the project:

- A. Identify relevant project information:
 - 1) The project name, address, contact person, and phone number.
 - 2) The owner's name, address, and phone number.
 - 3) Other specific information identifying the project may be required (e.g., development permit type, tract and lot number, etc.).
- B. Identify the code section or reference of the specific requirement for which the modification is requested (e.g., OFC Appendix D, Section D 103.2, Grade).
- C. Detail the alternate fire protection measures that will comprise the AM&M proposal, and how they establish equivalency to those prescribed in the code.

The report shall address TVF&R's concerns and the issues as identified above. Refer to the sample AM&M proposal letter provided at the end of this document for guidance.

2. Engineering Evaluation

If the Fire Chief, or established designee, deems an engineering evaluation necessary, it shall be performed and reported by a firm or individual that has been approved by TVF&R. All costs associated with the preparation of the AM&M shall be borne by the applicant.

3. Submittal Process

- A. Submit three copies of both the AM&M request letter and other supporting information to the City/County building department or directly to TVF&R.
- B. AM&M requests will be evaluated by TVF&R plan review staff for equivalency to adopted codes and standards. All such requests are evaluated on a case-by-case basis. Approval of the request is based upon several factors, including, but not limited to, the level of equivalency achieved (as described under "Scope" in this guideline), the effect of the AM&M on fire and emergency response, and site conditions. All evaluations will be performed in the context of the specific project being reviewed.

- C. If the AM&M proposal provides an equivalent level of protection considering all related conditions pertaining to the project, TVF&R will issue a response letter granting approval. Such approval may be conditional upon implementation of additional requirements listed in the AM&M response letter that were not part of the original AM&M proposal. Approval is granted only for the specific project under review, and the conditions for approval shall not be construed as applicable to any other project.
- D. In the event that the AM&M proposal does not provide an equivalent level of protection, the request will be denied and a response letter will be issued to this effect. Should the applicant submit a different AM&M request for this project or choose to revise and resubmit the previously denied request, additional AM&M fees must be paid. To facilitate the evaluation process, include any previously denied AM&M proposals when submitting a revised AM&M request.
- E. Upon completion of the evaluation, the AM&M response letter and a copy of the applicant's AM&M proposal will be available to be picked up at a Division office or mailed back to the applicant's representative. Should evaluation of the AM&M proposal require time and resources beyond the standard allotted for this activity, additional time and materials fees *may* be applied. These additional fees must be paid when the applicant picks up the AM&M response letter.
- F. The approved AM&M request and response letters must be blue lined on the plans prior to plan approval. Retain a copy of the AM&M proposal and response at the project site at all times. This documentation may be required for review by TVF&R inspection staff.

SAMPLE AM&M PROPOSAL LETTER

March 26, 2011

Tualatin Valley Fire & Rescue
Attn: Dana Scully, Deputy Fire Marshal
11945 SW 70th Ave.
Tigard, OR 97223

**SUBJECT: AM&M Proposal for the Big Truck Dealership - Sales and Service Remodel
Site Review, Land Use Case File 12-34 (LLP)**

Dear Ms. Scully:

In accordance with Section 104.9 of the 2010 Oregon Fire Code, we are requesting an alternate method of fire protection for the proposed project detailed below. This is in response to item 3 on the March 14, 2011 correction letter for the commercial site plan submitted under Washington County Land Use Case File 12-34 (TLP).

PROJECT INFORMATION

Project: Big Truck Dealership – Sales and Services
16000 SW Parkway Hwy
Aloha, OR 97078

Contact Info: Fox Mulder, FPE

PROPOSAL

The dealership addition is located in Washington County in the Aloha area. The proposed 10,000 square foot building addition is slated to be placed on the existing vacant portion of our property. Based on the Fire District comments, the addition will require access roads that support aerial fire apparatus and their operation.

I would like to propose the following alternate methods and materials in lieu of the aerial requirements:

1. Increase the design to NFPA 13 Ordinary Group 2 (12' sprinkler height). The original building sprinkler system was required to meet an NFPA 13 Ordinary Group 1 (8' sprinkler height).
2. Increase the design for head coverage to 100 square feet from the original sprinkler system design which required sprinkler head coverage of 130 square feet (increasing both the vertical and horizontal water sprinkler density by over 30% for this building).

JUSTIFICATION

The upgrade in sprinkler protection design will enhanced water supply will help to ensure that a room and contents fire will be effectively held in check until emergency personnel arrive.

ADDITIONAL COMMENTS

We appreciate your consideration of this proposal. Should you find that the proposed items provide an equivalent level of protection to that prescribed in the OFC, we will submit revised site plans. If you have any questions regarding this AM&M proposal, please do not hesitate to contact me.

Sincerely,

Fox Muelder, PE
Fire Protection Engineer



New Construction: Policy Intent Guide Appendix F

EMERGENCY RESPONDER RADIO COVERAGE (ERRC)

DATE: January 2015

(Revised: 5/2/2017)

PURPOSE: To define the requirements for application of OFC 510 Emergency Radio Responder Coverage.

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

CODE REFERENCES: 2014 OFC Sections 510 and 907.2.13.2, 2014 OSSC Sections 403.4.5 and 915

POLICY: EMERGENCY RADIO RESPONDER COVERAGE

The Oregon Fire Code (OFC) requires that certain newly constructed buildings have approved levels of emergency radio signal strength per OFC 510.2 (relative to existing levels of public radio coverage available at the exterior). Where the design of the building reduces the level of coverage inside of the building below minimum performance levels, a distributed antenna system, signal booster, or other method approved by TVF&R and Washington County Consolidated Communications Agency (WCCCA) shall be provided.

The following building types shall require Emergency Radio Coverage testing prior to Certificate-of-Occupancy (OFC 510.1.1):

1. Any building with one or more basements or below grade building levels
2. Any underground building
3. Any building more than five stories in height
4. Any building 50,000 square feet or larger

Testing: Documentation of testing in accordance with OFC 510.5.2 and 510.5.3 shall be provided to TVF&R prior to issuance of Certificate-of-Occupancy.

Testing shall take place after installation of all roofing systems; exterior walls, glazing and siding/cladding; and all permanent interiors walls, partitions, ceilings, and glazing.

If the building fails the OFC 510.3 test, a distributed antenna system with FCC certified signal booster or other approved system shall be installed to achieve the required level of radio coverage. Plans and specifications for ERRC systems must be approved by TVF&R and WCCCA prior to installation.

Mobile Emergency Radio Responder Coverage (MERRC):

Buildings qualify, and are evaluated, for the MERRC on an individual basis. Building applicants may request to participate in the MERRC program in lieu of testing and installing a BDA/DAS system by completing the application (available from TVF&R). Participation must be applied for and approved before a building permit is issued. Program information is located at <http://www.tvfr.com/DocumentCenter/View/1511>.

Washington County Consolidated Communications Agency (WCCCA) Approval:

FCC rules require anyone who has installed or will be installing a device that amplifies and rebroadcasts a public safety frequency must have an agreement with the public safety radio system owner. WCCCA is the owner of the emergency radio frequency used by TVF&R and therefore must approve any amplification of these frequencies. WCCCA has specific criteria that the system must be met and a legal agreement that parties must sign. Contact the Technical Services Manager at Washington County Consolidated Communications Agency (WCCCA), 503-690-4911 x266# for forms and information.

Technical Criteria: Please contact the Technical Services Manager at Washington County Consolidated Communications Agency (WCCCA), 503-690-4911 x266# for information per OFC 510.4.2.2 related to frequencies used, radio sites, etc. necessary for modeling or designing radio coverage or amplification.

Survivability:

Pathways serving Emergency Responder Radio System elements such as wiring, cables, boosters, and conduit shall be protected as specified in Oregon Structural Specialty Code Section 915.

Wired Communication Systems: Wired communication systems in accordance with OFC 907.2.13.2 are not allowed in lieu of an approved emergency radio communication system.

Plan Submittal, Inspection and Acceptance Testing (when a system is required): A permit for installation of a radio signal enhancement system shall be obtained from TVF&R and the applicable building department. A final acceptance test report per OFC 510.5.3 shall be provided to TVF&R prior to issuance of Certificate-of-Occupancy. Final approval from WCCCA is required prior to placing any system into service.

Coordination with Building Department / OSSC: TVF&R determines when a ERRC system is required and is has final authority for all requirements and testing specified in OFC Section 510. An ERRC system may only be waived if a determination is made by the fire code official.

When a ERRC system is required by TVF&R, then the applicable building department enforces OSSC 915, which primarily sets requirements for the survivability of certain circuits and components. OSSC does not regulate the equipment itself, radio frequencies, performance, testing or any other items in OFC 510.

It is important that applicants installing a ERRC system coordinate with the applicable building department in addition to TVF&R.