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**REVISED STAFF REPORT TO THE PLANNING COMMISSION
FOR THE
PUBLIC HEARING ON JUNE 6, 2011
REVISE CHAPTER 29 ACCESS AND FIRE FLOW STANDARDS
CASE FILE: PC 10-007**

PART I. INTRODUCTION

This staff report proposes amendments to the County's fire flow and fire apparatus access code to reduce conflicts with the current Oregon Fire Code, and to improve implementation of fire regulations in rural Multnomah County. The Oregon Fire Code has altered the fire flow requirements and established fire apparatus access standards for rural fire districts. It is not necessary for the County to have these standards as they are no longer alternative standards under the building code and apply to all properties proposing development requiring building permits. In addition to bringing county fire regulations into conformance with the state fire code, the proposals staff includes here are intended to streamline the permitting process by eliminating duplicative regulations and by relying on each structural fire service agency to implement fire protection regulations in accordance with their expertise and equipment.

Planning staff has coordinated with the various fire service providers via meetings and emails to understand their needs in implementing the Oregon Fire Code. In May 2010 and April 2011, the Planning Commission held work sessions on updating the Fire Apparatus Access and Fire Flow requirements for compliance with the current Oregon Fire Code (OFC).

At the last work session, the Planning Commission discussed the various options planning staff had developed to achieve conformance with the Oregon Fire Code. Fire Chief Tom Layton from Rural Fire Protection District #14 (Corbett) answered Commissioner's questions and outlined his and other fire agencies goals for the update. The following direction was given to planning staff on the three areas proposed for updating.

FIRE PROTECTION SERVICE

Fire service within unincorporated Multnomah County is provided by two types of fire agencies. Undeveloped properties are protected from wildfire by the State's Department of Forestry (DOF). DOF's *Protection From Fire Program's* main purpose is to protect 15.8 million acres (24,900 square miles) of private and public forestland from fire. For properties with development, structural fire protection services are provided via local fire service agencies such as Tualatin Valley Fire & Rescue or Scappoose Rural Fire Protection district. Unfortunately, some properties are not located within any of our Structural Fire Protection agencies' boundaries and cannot be served by contract. Planning staff and Commissioners discussed the two options for these underserved properties at the last work session. The Planning Commissioners considered both options and recommended that we allow development on properties that are outside of a district provided the project meets the Oregon Fire Code. The Oregon

Fire Code has alternative means available in it for these types of properties. Alternative means of fire suppression may include year-round ponds, storage tanks, fire sprinklers, etc.

Fire Flow & Access Standards

Presently Chapter 29, Building Regulations includes requirements for adequate water (fire flow) to put out a fire in your dwelling and roadway/driveway standards for fire apparatus access. These standards have been in effect since the mid 2000s. Since the adoption of the County's standards, the State of Oregon has adopted the Oregon Fire Code that provides similar standards for all development but in some areas it is more restrictive. Planning staff discussed with the Commission members whether the County should maintain its own standards or rely on the Oregon Fire Code. The act of streamlining to only the Oregon Fire Code appealed to the Commission members.

This staff report is organized into the parts listed below.

II. Changes to Chapter 29, Building Regulations

III. Changes to Commercial Forest Use Zones

The alterations in Part II will amend Chapter 29 only. The alterations in Part III are shown for the CFU-2 zone only, but will also amend the CFU-1 & CFU-5 zones in Chapter 33, CFU-3 & CFU-4 zones in Chapter 35 and the CFU zone in Chapter 36.

PART II. CHANGES TO CHAPTER 29 BUILDING REGULATIONS

The following language reflects the Planning Commission direction for amending Chapter 29 for consistency with the Oregon Fire Code:

CODE = PROPOSED CODE LANGUAGE

~~DELETE~~ = DELETED CODE LANGUAGE

MCC 29.003 ADOPTION OF STATE BUILDING CODE BY REFERENCE.

(A) Those portions of the state building code constituting the structural specialty code, ~~fire and life safety code~~, mechanical specialty code, and the one- and two-family dwelling specialty code, are adopted and by this reference incorporated as part of this subchapter. The provisions of this subchapter shall take precedence over the similar provisions of the state specialty codes.

(B) Prior to land use review, the applicant shall demonstrate that the proposed development is in compliance with the most current version of the Oregon Fire Code. Documentation of compliance shall be on forms provided by the Planning Director. Depending on the location of the parcel, the following agency shall review:

(1) A property served by a residential fire service provider shall have the proposed development reviewed by the fire official serving it.

(2) For properties located outside of the boundaries of a residential fire service provider, the property owners shall provide to Land Use Planning, evidence that a request for residential fire service has been made to the appropriate fire district. If residential fire protection is not available, alternative means of fire protection may be authorized by the applicable building official in accordance with the Oregon Fire Code.

~~(B) Except as modified in (C) below, the optional portion of the 1997 Uniform Building Code constituting the Division II Fire Flow standards in Appendix Chapter 9 are adopted and by reference incorporated as part of this subchapter as the requirements for determining fire flow for buildings constructed under a building permit issued after October 16, 2004, or for those portions of~~

~~buildings constructed under a building permit issued after October 16, 2004, that are “substantial improvements” to existing buildings. “Substantial improvements” mean the addition of more than 50 percent of the floor area to buildings that existed on October 16, 2004. For one and two family dwellings the floor area in “substantial improvements” does not include garages or attic spaces.~~

~~(1) As provided in Section 910 of Division II—Fire Flow, fire flow requirements may be modified downward or upward only upon approval by both the building official and the fire chief. The building official shall be the official currently under contract for providing building permit issuance services. The fire chief shall be the current chief, or delegate, of the fire district or city that provides fire services to the property.~~

~~(2) As referenced in Section 913 of Division II—Fire Flow, standards for fire department access and required fire hydrants shall be the applicable fire codes in the unincorporated area of the county, except as modified by the fire apparatus means of approach standards in § 29.012 and the alternate methods of fire protection in § 29.013.~~

~~(3) For properties within fire protection service districts that have adopted more stringent fire flow standards than contained in Division II—Fire Flow, Appendix Chapter 9, of the Uniform Building Code, the more stringent standards shall be utilized. In that circumstance, the fire chief’s authority for administering the fire flow standard shall be as given in the district’s ordinances.~~

~~(4) In recognition that Section 910 allows for fire flow modifications, particularly in rural areas or small communities, section § 29.003(C) below is a less restrictive modification of those fire flow standards that is appropriate for and shall apply to the unincorporated areas of Multnomah County that are outside of any city limits where a greater fire flow standard has not been adopted by the local fire protection provider.~~

~~(C) Notwithstanding any other fire flow requirement in Division II—Fire Flow, Appendix Chapter 9, the fire flow requirement and exception in subsection 912.1 “One and Two family Dwellings” shall be modified to require a minimum 500 gallons per minute for dwellings that are less than 3,600 square feet in floor area (excluding garages and attic spaces) and accessory buildings and garages that are less than 3,000 square feet in floor area (either detached or attached to the dwelling).~~

~~The continuous fire flow standard of 500 gallons per minute at the dwelling may be met by water flow and volume available from public water lines or by other water supply sources in conformance with standards in the 1999, or most current edition, “NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting” manual. If the 500 gallons per minute fire flow standard cannot be met from public water lines or other water supply sources, then the alternative provisions in (C)(1) through (C)(7) below shall be used in combination to meet a credit total that equals or exceeds 100% of the 500 gallons per minute standard.~~

Summary of methods to meet 100% of the Fire-Flow Requirement of 500 gal. per min.	
I.	500 gallons per minute fire flow is available from public water lines or other sources in compliance with NFPA 1142 standards [100%]; or

II.	Utilize the tanker truck credit in (C)(1) [50%] and any two of the following alternative credits: <ul style="list-style-type: none"> • Monitored alarm in (C)(2) [25%]; • Roof materials in (C)(3) [25%]; • Defensive space in (C)(4) [25%]; • Special approval by the Fire Chief in (C)(5) [25%]; or
III.	Use all the following alternative credits: <ul style="list-style-type: none"> • Monitored alarm in (C)(2) [25%]; • Roof materials in (C)(3) [25%]; • Defensive space in (C)(4) [25%]; • Special approval by the Fire Chief in (C)(5) [25%]; or
IV. :	Utilize the sprinkler system in (C)(6) [75%] and any one of the following alter native credits: <ul style="list-style-type: none"> • Tanker truck credit in (C)(1) [50%]; • Monitored alarm in (C)(2) [25%]; • Roof materials in (C)(3) [25%]; • Defensive space in (C)(4) [25%]; • Special approval by the Fire Chief in (C)(5) [25%].

- (1) An alternative credit of 50% shall be given upon verification by the local fire protection service provider that a water tanker truck of at least 3,000 gallon capacity is available to serve the property;
- (2) Where ~~fire protection services are available~~, an alternative credit of 25% shall be given for the use of a central station monitored smoke alarm system and the posting of a clearly visible rural address marker where the private driveway or private road intersects with the public road;
- (3) An alternative credit of 25% shall be given for the installation of Class A or non-combustible roofing shingles and the boxing in of all eaves, fascias, and soffits with fire resistant materials;
- (4) An alternative credit of 25% shall be given for the creation of “defensible space” against wildfire around the dwelling. On ground slopes of less than 20 percent, “defensible space” is an area 30 feet from the outside walls of a dwelling that is owned by or controlled by the homeowner. On ground slopes of 20 percent or greater, “defensible space” is an area 100 feet from the outside walls of a dwelling that is owned by or controlled by the homeowner. Prior to issuance of the building permit, verification shall be required that within the “defensible space”:
- (a) ~~Low hanging branches of existing trees have been pruned and removed within 8 feet of the proposed dwelling; and~~
 - (b) ~~Low hanging branches of existing trees have been pruned and removed within 8 feet of the ground as the maturity of the tree and accepted silviculture practices may allow; and~~
 - (c) ~~Existing trees are spaced with greater than 15 feet between crowns; and~~
 - (d) ~~All other vegetation is less than 2 feet in height;~~
- (5) In conjunction with meeting the requirements of (C)(2) above, the Fire Chief of the local fire protection provider may approve an additional credit of 25% when particular circumstances

warrant the credit. Such circumstances include, but are not limited to, specific fire prevention, fire containment, or fire suppression attributes of the proposed building site, building materials, or additional fire detection and/or suppression features.

(6) An alternative credit of 75% shall be given with the installation of a fire sprinkler system in conformance with the standards in the 1999 Edition, or the most current version, of the NFPA 13-D, Standard for the Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes (NFPA is the National Fire Protection Association, Inc.).

~~MCC 29.012 FIRE APPARATUS AND AMBULANCE MEANS OF APPROACH STANDARDS FOR PRIVATE STREETS AND PRIVATE DRIVEWAYS SERVING NEW AND REPLACEMENT ONE- AND TWO-FAMILY DWELLINGS.~~

Private streets and private driveways shall meet the standards in this section for fire apparatus access to new and replacement one and two family dwellings. The purpose of these standards is to establish minimum criteria for evaluating the adequacy of fire apparatus access during the review of building permit applications for proposed one and two family dwellings.

(1) Review and determination of compliance with the standards in § 29.012, or more stringent standards adopted by the fire protection service provider, shall be made by the Fire Marshal or designated fire official of that service district. If the Fire Marshal, or designee, fails to review and make a determination of compliance, then the building official shall, after consultation with the appropriate fire official, make a determination of compliance.

(2) The standards in this section implement the requirements in OAR 918-480-0100 through 918-480-0120 (2002), appropriate use of alternate methods of construction in the One and Two Family Specialty Code.

(3) An alternative to the minimum requirements of (D) below may be allowed by the building official, after consultation with the fire official, subject to the requirements of § 29.013.

(B) As used in § 29.012, "private street" and "private driveway" shall have the meanings given in the land division definition parts of the applicable Zoning Code Chapter of the Multnomah County Code.

(C) A building permit application for a new or replacement one or two family dwelling shall include sufficient information to determine compliance with the standards of § 29.012. A review form evaluating the proposal and signed by the applicable fire official shall also be submitted with the permit application.

(1) For those fire protection service districts that have adopted more stringent standards than given in (D) below, the more stringent standards shall prevail. The signed review by a fire district official shall state if the proposal is in compliance with the most stringent standards, either the district or those in (D) below.

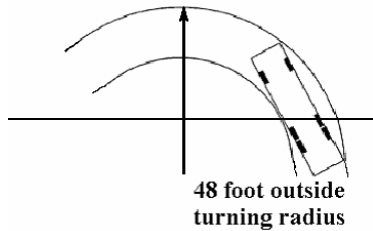
(2) Where there may be a conflict between the standards of this section and development standards in the county Zoning Code, the more stringent standard shall be utilized. The Planning Director shall provide this information to the building official with copies of any land use decision.

(D) Fire apparatus access requirements. The following standards shall apply to private streets and private driveways:

(1) Vehicle weight: Be built and maintained with an all weather driving surface that supports a gross vehicle weight of 50,000 pounds or the weight of the heaviest commonly used apparatus used by the fire protection service provider serving the subject property, whichever is greater.

Bridges, culverts and other structures shall also be required to meet this requirement. Written verification of compliance with the Gross Vehicle Weight standard may be required from an Oregon Professional Engineer.

(2) ~~Curve radius: Have an outside radius that is no less than 48 feet on all curves along the driveway or private street.~~



(3) ~~Vertical clearance: Have a vertical clearance of no less than 13 feet 6 inches.~~

(4) ~~Width: Be built and maintained from the public road to the end turnaround near the dwelling to a minimum unobstructed width, (including gate opening widths), of:~~

(a) ~~12 feet for a private driveway to a single dwelling;~~

(b) ~~12 feet for a private street to two dwellings;~~

(c) ~~20 feet for a three or more dwellings; and~~

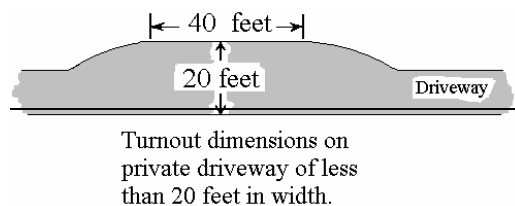
(d) ~~20 feet for all "accessways," regardless of the number of dwellings served. An "accessway" is a private street that is a separate tract of land that is owned in common by the abutting property owners for access and was approved under the provisions of the land division code after October 19, 1978.~~

(e) ~~The Fire Marshal, or designee, may approve an off-site built and maintained width of less than 20 feet, but not less than 12 feet in width, for a private street as given in (c) above. That approval, however, may not be applied to a required improvement width that is part of a Multnomah County land use decision.~~

(5) ~~Turnaround: Private streets and private driveways with lengths greater than 150 feet shall be built and maintained with a turnaround at or near the end of not less than 48 foot outside turning radius. Turnarounds may be circular or one of the variations of the hammerhead design (such as "T," one sided, or "Y").~~

(6) ~~Turnouts: No turnouts are required on private streets and private driveways that are improved to 20 feet or more in width as required by (D)(1) above. On private streets and private drive-ways that are improved to less than 20 feet in width, that are also greater than 200 feet in length, turnouts shall be built and maintained to:~~

(a) ~~Measure 20 feet in width for a length of 40 feet with adequate transitional curve radii at each end;~~



(b) ~~Have a maximum spacing of one-half the driveway length or 400 feet, whichever is less; and~~

~~(c) Where visibility is limited, the maximum spacing between turnouts shall be reduced appropriately.~~

~~(7) Grades: Shall not exceed an overall average grade of 12 percent with a maximum grade of 15 percent for lengths of no more than 200 feet.~~

~~(8) Distance to House: Shall reach to within 150 feet of all portions of the exterior wall of the first story of the dwelling as measured by an approved route around the exterior.~~

~~MCC 29.013 ALTERNATE METHOD OF FIRE PROTECTION - ONE AND TWO FAMILY DWELLINGS.~~

~~Pursuant to OAR 918 480 0100 through 918 480 0120 (2002), the building official may allow an alternate to the minimum requirements of the One and Two Family Dwelling Specialty Code as authorized by ORS 455.610, which may include, but is not limited to, installation of an automatic fire sprinkler system. That decision may be made where it is determined the fire apparatus means of approach to a property or the fire fighting water supply serving a property, does not meet the local standards adopted in accordance with the applicable fire code and state building code requirements. Before allowing the use of an alternative method of fire protection, the building official shall ensure the following criteria have been met:~~

~~(A) The alternate, such as an automatic fire sprinkler system, shall be at the request of the applicant;~~

~~(B) For lots of record created before January 1, 2002, the building official shall, prior to authorizing an alternate allowing the development of a parcel that could not otherwise be developed because it cannot meet adopted fire apparatus access standards or fire fighting water supply standards pursuant to § 29.012 and § 29.003(B), consult with the fire official having authority to approve an alternate;~~

~~(C) For lots of record created on or after January 1, 2002, the building official shall confirm the fire official having authority has:~~

~~(1) Approved the alternate to adopted fire apparatus access standards for shared private roads, private driveways or fire fighting water supply standards pursuant to § 29.012 and § 29.003(B), during the land use approval process; and~~

~~(2) The approved alternate has been recorded on the property deed or on a recorded deed restriction as a requirement for future construction.~~

~~(D) Providing the requirements of this rule are met, the local building official is authorized to enforce the conditions of an approved alternate method of construction when it is part of the building construction; and~~

~~(E) When the approved alternate is a fire sprinkler system, the minimum standard for installation within one and two family dwellings shall be the 1999 Edition, or the most current version, of NFPA 13-D, Standard for the Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes (NFPA is the National Fire Protection Association, Inc).~~

PART III. CHANGES TO COMMERCIAL FOREST USE ZONES

In order to implement the Planning Commission's direction of relying on the Oregon Fire Code, the access standards contained in the Commercial Forest Use zone's Development Standards will be deleted. After the modification, the County will rely solely on the Oregon Fire Code for access standards for driveways. These standards are found in Appendix D of the OFC attached here as Attachment 3.

CODE = PROPOSED CODE LANGUAGE

~~DELETE~~ = DELETED CODE LANGUAGE

MCC 33.2261 DEVELOPMENT STANDARDS FOR DWELLINGS AND STRUCTURES

[The same changes are made to 35.2061, 35.2261 and 36.2061]

* * *

(B) New dwellings, replacement dwellings greater than 100-feet from an existing dwelling, and accessory buildings (or similar structures) greater than 100-feet from a dwelling shall meet the following standards in (1) and (3) or (2) and (3):

* * *

(3) The risks associated with wildfire are minimized. Provisions for reducing such risk shall include:

~~(a) The proposed dwelling will be located upon a tract within a fire protection district or the dwelling shall be provided with residential fire protection by contract;~~

(a) Access roadways shall be approved, developed and maintained in accordance with the requirements of the structural fire service provider that serves the property. Where no structural fire service provider provides fire protection service, the access roadway shall meet the Oregon Fire Code requirements for fire apparatus access.

(b) Access for a pumping fire truck to within 15 feet of any perennial water source of 4,000 gallons or more within 100 feet of the driveway or road on the lot. The access shall meet the fire apparatus access driveway standards of MCC 33.2261(E) the Oregon Fire Code with permanent signs posted along the access route to indicate the location of the emergency water source.

~~(E) A private road (including approved easements) accessing two or more dwellings, a driveway accessing a single dwelling, a Forest Practices road that is utilized as a private road/driveway accessing a dwelling(s), or a new driveway constructed to access a replacement/restored dwelling, shall be designed, built, and maintained to:~~

~~(1) Support a minimum gross vehicle weight (GVW) of 52,000 lbs. Written verification of compliance with the 52,000 lb. GVW standard from an Oregon Professional Engineer shall be provided for all bridges or culverts;~~

~~(2) Provide an all weather surface of at least 20 feet in width for a private road and 12 feet in width for a driveway;~~

~~(3) Provide minimum curve radii of 48 feet or greater;~~

~~(4) Provide an unobstructed vertical clearance of at least 13 feet 6 inches;~~

~~(5) Provide grades not exceeding 8 percent, with a maximum of 12 percent on short segments, except as provided below:~~

~~(a) Rural Fire Protection District No. 14 requires approval from the Fire Chief for grades exceeding 6 percent;~~

~~(b) The maximum grade may be exceeded upon written approval from the fire protection service provider having responsibility;~~

~~(6) Provide a turnaround with a radius of 48 feet or greater at the end of any access exceeding 150 feet in length;~~

~~(7) Provide for the safe and convenient passage of vehicles by the placement of:~~

- ~~(a) Additional turnarounds at a maximum spacing of 500 feet along a private road; or~~
- ~~(b) Turnouts measuring 20 feet by 40 feet along a driveway in excess of 200 feet in length at a maximum spacing of 1/2 the driveway length or 400 feet whichever is less.~~
- ~~(8) An existing driveway currently being utilized by the habitable dwelling may be extended to a replacement dwelling without compliance with the roadway standards above. However, nothing in this exemption removes the requirements under the county's Fire Apparatus means of Approach Standards contained in MCC 29.012.~~

§ 33.7785 CREATION OF LOTS AND PARCELS THAT WERE UNLAWFULLY DIVIDED

[The same changes are made to 34.7785, 35.7785, and 36.7785]

This Code section provides the mechanism to review and, based upon findings of compliance with specific approval criteria, to approve certain unlawfully divided lots or parcels. The review mechanism to correct an unlawfully divided unit of land differs according to the date the unlawful lot or parcel was divided as provided in (A) and (B) below, or under (C) if a land use permit was issued for a primary use. For the purposes of this section, an "unlawfully divided" lot or parcel means a lot or parcel that, when divided, did not satisfy all applicable zoning and land division laws.

(A) An application to create a legal lot or parcel from an unlawfully divided unit of land divided before January 27, 1994 (eff. date of Mult. Co. Ord. 781) shall be a Category 4 Land Division and be reviewed as a Type II process. In addition to the applicable Category 4 Land Division requirements, the application shall satisfy the following approval criteria:

- (3) Practical physical access to the site currently exists from a public road or can be provided through an irrevocable easement or equivalent means. Practical physical access at a minimum must meet the standards of MCC ~~29.012~~ 29.003 and allow emergency vehicle access to the building site.

PART IV. ATTACHMENTS

The attached documents contain information that is intended to assist the Planning Commission in their evaluation of the proposed code changes to Chapter 29, Building Regulations and Chapters 33, 34, 35, & 36.

Attachment 1: 2010 Oregon Fire Code, Chapter 5, Fire Service Features

Attachment 2: Appendix B Fire Flow Requirements for Buildings

Attachment 3: Appendix D Fire Apparatus Access Roads

2010 Oregon Fire Code

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CHAPTER 5

FIRE SERVICE FEATURES

SECTION 501 GENERAL

501.1 Scope. Fire service features for buildings, structures and premises shall comply with this chapter. See also ORS 92.044, 203, 221, 195.065, 368.039, 478.920 and OAR 918-480-0100.

ORS Chapters 92.044, 203, 221, 368.039, 195.065 and 478.920 and OAR Chapter 918 are not a part of this code but are reproduced or paraphrased here for the reader's convenience.

ORS 92.044 is the adoption of standards and procedures governing approval of plats and plans; delegation to planning commission; fees.

ORS 203 is the county bodies; county home rule.

ORS 221 is the organization and government of cities.

ORS 368.039 allows road standards adopted by local government to supercede standards in fire codes and requires consultation with local fire agency.

ORS 195.065 requires local governments and special districts that provide urban service to enter into urban service agreements. For the purpose of this statute, "urban service" means: sanitary sewers, water, fire protection, parks, open space, recreation and streets, roads and mass transit.

ORS 478.920 describes elements that may be included in the scope of a fire prevention code adopted by a rural fire protection district, including but not limited to: mobile fire apparatus means of approach to buildings and structures, and providing fire-fighting water supplies and fire detection and suppression apparatus adequate for the protection of buildings and structures.

OAR 918-480-0100 describes the procedure for approving the installation of automatic fire sprinklers where fire apparatus access or fire-fighting water supply do not meet local standards.

ORS 479.200 regulates water supply requirements for certain public buildings erected after July 1, 1967, as defined in ORS 479.010(1)(1).

501.2 Permits. A permit shall be required as set forth in Sections 105.6 and 105.7.

501.3 Construction documents. *Construction documents* for proposed fire apparatus access, location of *fire lanes*, security gates across fire apparatus access and *construction documents* and hydraulic calculations for fire hydrant systems shall be submitted to the fire department for review and approval prior to construction.

501.4 Timing of installation. When fire apparatus access roads or a water supply for fire protection is required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction except when

approved alternative methods of protection are provided. Temporary street signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles in accordance with Section 505.2.

SECTION 502 DEFINITIONS

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FIRE APPARATUS ACCESS ROAD. A road that provides fire apparatus access from a fire station to a facility, building or portion thereof. This is a general term inclusive of all other terms such as *fire lane*, public street, private street, parking lot lane and access roadway.

Note: Specifications and standards for public streets are regulated by county or city governing bodies in accordance with ORS 368.039 wherein input from the fire service is required during planning for community development projects.

FIRE COMMAND CENTER. The principal attended or unattended location where the status of the detection, alarm communications and control systems is displayed, and from which the system(s) can be manually controlled.

FIRE DEPARTMENT MASTER KEY. A limited issue key of special or controlled design to be carried by fire department officials in command which will open key boxes on specified properties.

FIRE LANE. A road or other passageway developed to allow the passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than fire apparatus.

KEY BOX. A secure device with a lock operable only by a fire department master key, and containing building entry keys and other keys that may be required for access in an emergency.

SECTION 503 FIRE APPARATUS ACCESS ROADS

503.1 Where required. Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through 503.1.3. See Appendix D.

503.1.1 Buildings and facilities. *Approved* fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the exterior walls of the first story

of the building as measured by an *approved* route around the exterior of the building or facility.

Exception: The *fire code official* is authorized to modify Sections 503.1 and 503.2 where any of the following applies:

1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an *approved* alternative means of fire protection is provided.
3. There are not more than two Group R-3 or Group U occupancies.

503.1.2 Additional access. The *fire code official* is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

503.1.3 High-piled storage. Fire department vehicle access to buildings used for *high-piled combustible storage* shall comply with the applicable provisions of Chapter 23.

503.2 Specifications. Fire apparatus access roads shall be installed and arranged in accordance with Sections 503.2.1 through 503.2.8.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), exclusive of shoulders, except for *approved* security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

503.2.2 Authority. The *fire code official* shall have the authority to modify the dimension specified in Section 503.2.1.

503.2.3 Surface. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all-weather driving capabilities.

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall be determined by the *fire code official*.

503.2.5 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) in length shall be provided with an *approved* area for turning around fire apparatus.

503.2.6 Bridges and elevated surfaces. 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. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges when required by the *fire code official*. 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 code official*.

503.2.7 Grade. The grade of the fire apparatus access road shall be within the limits established by the *fire code official* based on the fire department's apparatus.

503.2.8 Angles of approach and departure. The angles of approach and departure for fire apparatus access roads shall be within the limits established by the *fire code official* based on the fire department's apparatus.

503.3 Marking. Where required by the *fire code official*, *approved* signs or other *approved* notices or markings that include the words NO PARKING—FIRE LANE shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. The means by which *fire lanes* are designated shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility.

503.4 Obstruction of fire apparatus access roads. Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in Section 503.2.1 shall be maintained at all times.

503.5 Required gates or barricades. The *fire code official* is authorized to require the installation and maintenance of gates or other *approved* barricades across fire apparatus access roads, trails or other accessways, not including public streets, alleys or highways. Electric gate operators, where provided, shall be *listed* in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

503.5.1 Secured gates and barricades. When required, gates and barricades shall be secured in an *approved* manner. Roads, trails and other accessways that have been closed and obstructed in the manner prescribed by Section 503.5 shall not be trespassed on or used unless authorized by the *owner* and the *fire code official*.

Exception: The restriction on use shall not apply to public officers acting within the scope of duty.

503.6 Security gates. The installation of security gates across a fire apparatus access road shall be *approved* by the fire chief. Where security gates are installed, they shall have an *approved* means of emergency operation. The security gates and the emergency operation shall be maintained operational at all times. Electric gate operators, where provided, shall be *listed* in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

SECTION 504

ACCESS TO BUILDING OPENINGS AND ROOFS

504.1 Required access. Exterior doors and openings required by this code or the *International Building Code* shall be maintained readily accessible for emergency access by the fire department. An *approved* access walkway leading from fire apparatus access roads to exterior openings shall be provided when required by the *fire code official*.

504.2 Maintenance of exterior doors and openings. Exterior doors and their function shall not be eliminated without prior approval. Exterior doors that have been rendered nonfunctional and that retain a functional door exterior appearance shall have a sign affixed to the exterior side of the door with the words THIS DOOR BLOCKED. The sign shall consist of letters having a principal stroke of not less than $\frac{3}{4}$ inch (19.1 mm) wide and at least 6 inches (152 mm) high on a contrasting background. Required fire department access doors shall not be obstructed or eliminated. *Exit* and *exit access* doors shall comply with Chapter 10. Access doors for *high-piled combustible storage* shall comply with Section 2306.6.1.

504.3 Stairway access to roof. New buildings four or more stories above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33.3-percent slope), shall be provided with a *stairway* to the roof. *Stairway* access to the roof shall be in accordance with Section 1009.12. Such *stairway* shall be marked at street and floor levels with a sign indicating that the *stairway* continues to the roof. Where roofs are used for roof gardens or for other purposes, *stairways* shall be provided as required for such occupancy classification.

SECTION 505 PREMISES IDENTIFICATION

505.1 Address 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. These numbers shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches (101.6 mm) high with a minimum stroke width of 0.5 inch (12.7 mm). Where access is by means of a private road and the building cannot be viewed from the *public way*, a monument, pole or other sign or means shall be used to identify the structure.

505.2 Street or road signs. Streets and roads shall be identified with *approved* signs. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles. Signs shall be of an *approved* size, weather resistant and be maintained until replaced by permanent signs.

SECTION 506 KEY BOXES

506.1 Where required. Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the *fire code official* is authorized to require a key box to be installed in an *approved* location. The key box shall be of an *approved* type and shall contain keys to gain necessary access as required by the *fire code official*.

Exception: Pharmacies in accordance with OAR 855-041-0035.

506.1.1 Locks. An *approved* lock shall be installed on gates or similar barriers when required by the *fire code official*.

506.2 Key box maintenance. The operator of the building shall immediately notify the *fire code official* and provide the new key when a lock is changed or rekeyed. The key to such lock shall be secured in the key box.

SECTION 507 FIRE PROTECTION WATER SUPPLIES

507.1 Required water supply. An *approved* water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction.

507.2 Type of water supply. A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

507.2.1 Private fire service mains. Private fire service mains and appurtenances shall be installed in accordance with NFPA 24.

507.2.2 Water tanks. Water tanks for private fire protection shall be installed in accordance with NFPA 22.

507.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an *approved* method. See Appendix B.

507.4 Water supply test. The *fire code official* shall be notified prior to the water supply test. Water supply tests shall be witnessed by the *fire code official* or *approved* documentation of the test shall be provided to the *fire code official* prior to final approval of the water supply system.

507.5 Fire hydrant systems. Fire hydrant systems shall comply with Sections 507.5.1 through 507.5.6. See Appendix C.

507.5.1 Where required. Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an *approved* route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the *fire code official*.

Exceptions:

1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet (183 m).
2. For buildings equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the distance requirement shall be 600 feet (183 m).

507.5.2 Inspection, testing and maintenance. Fire hydrant systems shall be subject to periodic tests as required by the *fire code official*. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, *alterations* and servicing shall comply with *approved* standards.

507.5.3 Private fire service mains and water tanks. Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 at the following intervals:

1. Private fire hydrants (all types): Inspection annually and after each operation; flow test and maintenance annually.
2. Fire service main piping: Inspection of exposed, annually; flow test every 5 years.
3. Fire service main piping strainers: Inspection and maintenance after each use.

507.5.4 Obstruction. Unobstructed access to fire hydrants shall be maintained at all times. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants.

507.5.5 Clear space around hydrants. A 3-foot (914 mm) clear space shall be maintained around the circumference of fire hydrants except as otherwise required or *approved*.

ORS 811.550(16) is not a part of this code but is reproduced or paraphrased here for the reader's convenience.

ORS 811.550(16) prohibits parking within 10 feet (3048 mm) of a fire hydrant.

OAR 860-024-0010 is not a part of this code but is reproduced or paraphrased here for the reader's convenience.

ORS 860-024-0010 is an Oregon Public Utility Commission rule that adopts the National Electrical Safety Code (NESC). The NESC contains rules that limit the placement of a fire hydrant a minimum of 4 feet (1219 mm) from any supporting structure for electrical equipment, such as transformers and poles.

507.5.6 Physical protection. Where fire hydrants are subject to impact by a motor vehicle, guard posts or other *approved* means shall comply with Section 312.

SECTION 508 FIRE COMMAND CENTER

508.1 General. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a *fire command center* for fire department operations shall be provided and shall comply with Sections 508.1.1 through 508.1.5.

508.1.1 Location and access. The location and accessibility of the *fire command center* shall be *approved* by the fire chief.

508.1.2 Separation. The *fire command center* shall be separated from the remainder of the building by not less than a 1-hour *fire barrier* constructed in accordance with Section 707 of the *International Building Code* or *horizontal assembly* constructed in accordance with Section 712 of the *International Building Code*, or both.

508.1.3 Size. The *fire command center* shall be a minimum of 200 square feet (19 m²) in area with a minimum dimension of 10 feet (3048 mm).

508.1.4 Layout approval. A layout of the *fire command center* and all features required by this section to be contained therein shall be submitted for approval prior to installation.

508.1.5 Required features. The *fire command center* shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *stairway* doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, fire-fighting equipment and fire department access, and the location of *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

SECTION 509 FIRE PROTECTION EQUIPMENT IDENTIFICATION AND ACCESS

509.1 Identification. Fire protection equipment shall be identified in an *approved* manner. Rooms containing controls for air-conditioning systems, sprinkler risers and valves, or other

fire detection, suppression or control elements shall be identified for the use of the fire department. *Approved* signs required to identify fire protection equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible.

509.2 Equipment access. *Approved* access shall be provided and maintained for all fire protection equipment to permit immediate safe operation and maintenance of such equipment. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent such equipment from being readily accessible.

SECTION 510 EMERGENCY RESPONDER RADIO COVERAGE

510.1 Emergency responder radio coverage in buildings.

All buildings, as described in Section 510.1.1, shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building (see Appendix J). This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.

510.1.1 Scope. Emergency responder radio coverage must be provided in the following buildings and locations:

1. Any building with one or more basement 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 (4645 m²) in size or larger.
5. Any building that, through performance testing, does not meet the requirements of Section 510.

510.2 Radio signal strength. The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements of Sections 510.2.1 and 510.2.2.

510.2.1 Minimum signal strength into the building. A minimum signal strength of -95 dBm shall be receivable within the building.

510.2.2 Minimum signal strength out of the building. A minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from within the building.

510.3 Emergency responder radio coverage in existing buildings. Existing buildings that do not have approved radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Wherever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1, Exception 1.
2. Within a time frame established by the adopting authority.

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this appendix are adopted by the State of Oregon.

SECTION B101 GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix and as required by the fire code official. This appendix does not apply to structures other than buildings. Also see ORS 479.200.

ORS 479.200 is not a part of this code but is reproduced or paraphrased here for the reader's convenience.

ORS 479.200 regulates water supply requirements for certain buildings erected after July 1, 1967, as defined in ORS 479.010(1)(i).

SECTION B102 DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m²), used to determine the required fire flow.

OCCUPANCY HAZARD. A classification system based on the classification of occupancies and commodities system specified in NFPA 13.

PROTECTED AREAS. Geographic areas where a service or an agency has been established for the purpose of providing fire suppression services for buildings and other structures. Examples of agencies typically include public fire departments, rural fire protection districts and private fire protection services.

UNPROTECTED AREAS. Geographic areas where no organized service or agency exists to provide fire suppression services for buildings and other structures. Examples of unprotected areas typically included areas where wildland fire protection is provided by federal (USFS, BLM, BIA, etc.) state (ODF), or regional (forest protection associations) organizations and other areas that are generally in remote or rural isolated areas where no structural fire protection service is present.

SECTION B103 MODIFICATIONS

B103.1 Decreases. The fire code official is authorized to reduce the fire-flow requirements when the development of full fire-flow requirements is impractical based on, but not limited to, the following: type of occupancy, type of construction,

location on property, floor area, height and number of stories, yards as defined by the *International Building Code*, fire walls, and the fire-fighting capabilities of the jurisdiction.

B103.2 Increases. The fire code official is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Limiting. The fire code official is authorized to limit the maximum required fireflow based on, but not limited to, the fire-fighting capabilities of the jurisdiction. Fire-flow limitations shall be in accordance with Section B106 which are in addition to the fire-flow requirements as specified in Section B105.

SECTION B104 FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section B104.2 or B104.3.

B104.2 Area separation. Portions of buildings which are separated by *fire walls* constructed in accordance with the *International Building Code*, are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105 FIRE-FLOW REQUIREMENTS FOR BUILDINGS IN PROTECTED AREAS WITH ADEQUATE AND RELIABLE WATER SYSTEMS

B105.1 General. The provisions of Section B105 are intended for use by the fire code official in protected areas in which adequate and reliable water systems exist. Refer to Section B106 for additional alternative provisions regarding limiting fire flows.

B105.2 One- and two-family dwellings. The minimum fire-flow and flow duration requirements for one- and two-family *dwellings* having a fire-flow calculation area that does not exceed 3,600 square feet (344.5 m²) shall be 1,000 gallons per minute (3785.4 L/min) at 20 pounds per square inch (138kPa) residual for 1 hour. Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600

square feet (344.5m²) shall not be less than that specified in Table B105.1 as modified by Section B105.4.

Exceptions:

1. A reduction in required fire-flow of 50 percent is allowed when the building is provided with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.3 (NFPA 13D) of the *Oregon Fire Code*.
2. When there are not more than one each, Group R, Division 3 and Group U occupancies or agricultural buildings, as defined by ORS 455.315, on a single parcel of not less than 1 acre, the requirements of this section may be modified provided, the Group R, Division 3 occupancy does not require a fire flow in excess of 1500 gallons per minute (5678 L/min) and in the opinion of the fire code official, fire fighting or rescue operations would not be impaired.

B105.3 Buildings other than one- and two-family dwellings. The minimum fire-flow and flow duration for buildings other than one- and two-family *dwellings* shall be as specified in Table B105.1, as modified by Sections B105.3 and B105.4.

B105.3.1 Fire-flow reductions. The total required fire-flow may be reduced by one of the following options, but in no case shall the resulting fire-flow be less than 1500 gallons per minute (5678 L/min) at 20 pounds per square inch (138 kPa) residual.

B105.3.1.1 Sprinkler systems. A reduction in required fire-flow of up to 75 percent, as approved, is allowed when the building is provided with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 (NFPA 13) or 903.3.1.2 (NFPA 13R).

B105.3.1.2 Fire alarm systems. A reduction in required fire-flow of 25 percent is allowed when the building is provided with an approved automatic and manual fire alarm system that is installed throughout the building and is monitored by an approved central receiving station. The systems shall meet all requirements of NFPA 72 as specified for a central station fire alarm system providing total (complete) coverage by detection devices.

B105.4 Occupancy hazard modifiers. Where a single occupancy classification, as defined by NFPA 13, or a single high-piled combustible storage commodity classification, as specified in Section 2303, is present in a building, the minimum fire-flow required by Table B105.1 shall be multiplied by the appropriate factor in Table B105.4 to determine the total required fire-flow, but in no case shall the resulting fire-flow be less than 1500 gallons per minute (5678 L/min) at 20 pounds per square inch (138 kPa) residual.

B105.4.1 Multiple occupancy hazards. Where more than one occupancy classification, or commodity classification is present in a building, the minimum fire-flow required by Table B105.1 shall be proportioned by percentage of the floor area used for each hazard. The proportioned building fire-flow shall be multiplied by the factor, relating to that portion of the building, in Table B105.4 and totaled to determine the total required fire-flow, but in no case shall the resulting fire-flow be less than

1500 gallons per minute (5678 L/min) at 20 pounds per square inch (138 kPa) residual.

TABLE B105.4

Light hazard occupancies	0.75
Ordinary hazard (Group 1)	0.85
Ordinary hazard (Group 2) and HPCS ^a Classes I & II	1.00
Extra hazard (Group 1) and HPCS Class III	1.15
Extra hazard (Group 2) and HPCS Classes IV & High Hazard	1.25

a. HPCS—High-piled combustible storage

SECTION B106 LIMITING FIRE-FLOW REQUIREMENTS FOR BUILDINGS IN PROTECTED AREAS WITH ADEQUATE AND RELIABLE WATER SYSTEMS

B106.1 General. The provisions of Section B106 are intended for use by the fire code official in addition to the provisions specified in Section B105 as authorized by Section B103.3. This section is intended to apply in protected areas in which adequate and reliable water systems exist.

B106.2 Limiting required fire-flow. No building shall be constructed, altered, enlarged, moved, or repaired in a manner that by reason of size, type of construction, number of stories, occupancy, or any combination thereof creates a need for a fire-flow in excess of 3,000 gallons per minute (11 356 L/min) at 20 pounds per square inch (138 kPa) residual pressure as specified in Table B105.1, or exceeds the available fire-flow at the site of the structure.

Exception: Fire-flow requirements in excess of 3,000 gallons per minute (11 356 L/min) may be allowed if, in the opinion of the fire code official, all reasonable methods of reducing the fire-flow have been included within the development and no unusual hazard to life and property exists.

B106.3 Existing buildings. Existing buildings that require a fire-flow in excess of 3,000 gallons per minute (11 356 L/min) are not required to comply with the fire-flow requirements of this section. However, changes in occupancies or the character of occupancies, alterations, additions or repairs shall not further increase the required fire-flow for buildings.

SECTION B107 FIRE-FLOW REQUIREMENTS FOR BUILDINGS IN PROTECTED AREAS WITHOUT ADEQUATE AND RELIABLE WATER SYSTEMS

B107.1 Areas without water supply systems. The provisions of Section B107 are intended for use by the fire code official in protected areas in which adequate and reliable water supply systems do not exist. In determining the fire-flow for buildings, the fire code official is authorized to utilize the following nationally recognized standards; NFPA 1142, the *International Urban-Wildland Interface Code* or the *ISO Guide for Determining Needed Fire Flow, 2005 Edition*.

TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute) ^b	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	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
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	
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.

**SECTION B108
FIRE-FLOW REQUIREMENTS FOR
BUILDINGS IN UNPROTECTED AREAS
(RESERVED)**

**SECTION B109
REFERENCED STANDARDS**

ICC	IBC-09	International Building Code	B104.2, Table B105.1
ICC	IFC	International Fire Code	B105.3
ICC	IWUIC-09	International Wildland- Urban Interface Code	B107.1
NFPA	1142-07	Standard on Water Supplies for Suburban and Rural Fire Fighting	B107.1
ISO		Guide for Determining Needed Fire Flow, 2005 Edition	B107.1

APPENDIX D

FIRE APPARATUS ACCESS ROADS

The provisions contained in this appendix are adopted by the State of Oregon.

SECTION D101 GENERAL

D101.1 Scope. Fire apparatus access roads shall be in accordance with this appendix and all other applicable requirements of the *International Fire Code*. The fire code official may be guided by the Oregon Department of Land Conservation and Development's Neighborhood Street Design Guidelines, June 2001.

SECTION D102 REQUIRED ACCESS

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing at least 60,000 pounds (27 240 kg).

Exception: The minimum weight specified in Section D102.1 may be increased by the fire code official based upon the actual weight of fire apparatus vehicles serving the jurisdiction that provides structural fire protection services to the location including fire apparatus vehicles that respond under automatic and mutual aid agreements.

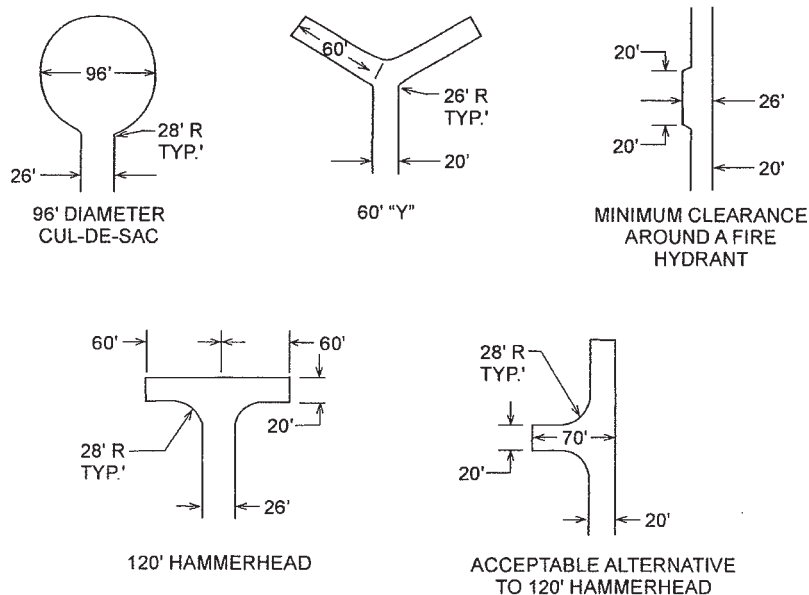
D102.1.1 Access in wildland-urban interface areas. For egress and access concerns in wildland-urban interface locations, the fire code official may be guided by the *International Wildland-Urban Interface Code*.

SECTION D103 MINIMUM SPECIFICATIONS

D103.1 Access road width with a hydrant. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders (see Figure D103.1).

Exceptions: The fire code official is authorized to modify the provisions of Section D103.1 when:

1. In accordance with OAR 918-480-0100, all buildings are completely protected with an approved automatic fire sprinkler system;
2. Provisions are made for the emergency use of sidewalks by such means as rolled or mountable curbs capable of supporting the fire department's apparatus;
3. Streets or roadways are identified for one-way circulating flow of traffic or pullouts are provided every 150 feet (45 720 mm) on streets or roadways identified for two-way traffic; or
4. A grid system for traffic flow is provided and streets or roadways in the grid do not exceed 300 feet (91 400 mm) in length but are accessible at each end from approved access roadways or streets.



For SI: 1 foot = 304.8 mm.

FIGURE D103.1
DEAD-END FIRE APPARATUS ACCESS ROAD TURNAROUND

D103.2 Grade. Fire apparatus access roads shall not exceed 10 percent in grade.

Exception: Grades steeper than 10 percent as *approved* by the fire chief.

D103.3 Turning radius. The minimum turning radius shall be determined by the *fire code official*.

D103.3.2 Drainage. When subject to run-off damage, the fire code official is authorized to require approved drainage.

D103.4 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4.

TABLE D103.4
REQUIREMENTS FOR DEAD-END FIRE
APPARATUS ACCESS ROADS

LENGTH (feet)	WIDTH (feet)	TURNAROUNDS REQUIRED
0–150	20	None required
151–500	20	120-foot Hammerhead, 60-foot “Y” or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
501–750	26	120-foot Hammerhead, 60-foot “Y” or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
Over 750		Special approval required

For SI: 1 foot = 304.8 mm.

D103.5 Fire apparatus access road gates. Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1. The minimum gate width shall be 20 feet (6096 mm).
2. Gates shall be of the swinging or sliding type.
3. Construction of gates shall be of materials that allow manual operation by one *person*.
4. Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.
5. 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*.
6. Manual opening gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by means of forcible entry tools or when a key box containing the key(s) to the lock is installed at the gate location.
7. Locking device specifications 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 F 2200.

D103.6 Signs. Where required by the *fire code official*, fire apparatus access roads shall be marked with permanent NO PARKING—FIRE LANE signs complying with Figure D103.6. Signs shall have a minimum dimension of 12 inches (305 mm) wide by 18 inches (457 mm) high and have red letters on a white reflective background. Signs shall be posted on one or both sides of the fire apparatus road as required by Section D103.6.1 or D103.6.2.

D103.6.1 Roads 20 to 26 feet in width. Fire apparatus access roads 20 to 26 feet wide (6096 to 7925 mm) shall be posted on both sides as a *fire lane*.

D103.6.2 Roads more than 26 feet in width. Fire apparatus access roads more than 26 feet wide (7925 mm) to 32 feet wide (9754 mm) shall be posted on one side of the road as a *fire lane*.

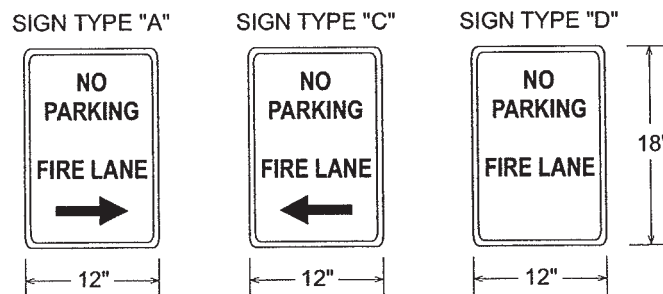


FIGURE D103.6
FIRE LANE SIGNS

SECTION D104

COMMERCIAL AND INDUSTRIAL DEVELOPMENTS

D104.1 Buildings exceeding three stories or 30 feet in height. Buildings or facilities exceeding 30 feet (9144 mm) or three stories in height shall have at least two means of fire apparatus access for each structure.

D104.2 Buildings exceeding 62,000 square feet in area. Buildings or facilities having a gross *building area* of more than 62,000 square feet (5760 m²) shall be provided with two separate and *approved* fire apparatus access roads.

Exception: Projects having a gross *building area* of up to 124,000 square feet (11 520 m²) that have a single *approved* fire apparatus access road when all buildings are equipped throughout with *approved automatic sprinkler systems*.

D104.3 Remoteness. 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 property or area to be served, measured in a straight line between accesses.

SECTION D105

AERIAL FIRE APPARATUS ACCESS ROADS

D105.1 Where required. Buildings or portions of buildings or facilities exceeding 30 feet (9144 mm) in height above the low-

est level of fire department vehicle access shall be provided with *approved* fire apparatus access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway.

D105.2 Width. Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm), exclusive of shoulders, in the immediate vicinity of any building or portion of building more than 30 feet (9144 mm) in height.

D105.3 Proximity to building. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet (4572 mm) and a maximum of 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building.

SECTION D106

MULTIPLE-FAMILY RESIDENTIAL DEVELOPMENTS

D106.1 Projects having more than 100 dwelling units. Multiple-family residential projects having more than 100 *dwelling units* shall be equipped throughout 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 *approved automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

D106.2 Projects having more than 200 dwelling units. Multiple-family residential projects having more than 200 *dwelling units* shall be provided with two separate and *approved* fire apparatus access roads regardless of whether they are equipped with an *approved automatic sprinkler system*.

SECTION D107

ONE- OR TWO-FAMILY RESIDENTIAL DEVELOPMENTS

D107.1 One- or two-family dwelling residential developments. Developments of one- or two-family *dwelling units* 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.

Exceptions:

1. 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.
2. The number of *dwelling units* on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the *fire code official*.

D108

REFERENCED STANDARDS

ASTM F 2200-05	Standard Specification for Automated Vehicular Gate Construction	D103.5
ICC	IFC-09 International Fire Code	D101.5, D107.1
UL	325-02 Door, Drapery, Gate, Louver, and Window Operators and Systems, with revisions through February 2006	D103.5

