

Marion County

Fire Code Applications Guide

Based on the 2022 Oregon Fire Code (rev. 7/2024)



This guide is intended to provide assistance in the application of emergency apparatus Access and Water Supply code requirements in the following fire jurisdictions:

Aumsville Fire District
Aurora Fire District
Drakes Crossing Fire District
Gates Fire District
Hubbard Fire District
Idanha-Detroit Fire District
Jefferson Fire District
Keizer Fire District
Marion County Fire District #1
Mill City Fire District

Monitor Fire District
Mt. Angel Fire District
Salem Fire Department
Salem Suburban Fire District
Silverton Fire District
St. Paul Fire District
Stayton Fire District
Sublimity Fire District
Turner Fire District
Woodburn Fire District

Notes to Users

Local Development Codes

Check the local city or county development code to determine the applicability of roadway standards as it relates to conflicts with this guide and/or the adopted fire code.

ORS 368.039 Road standards adopted by local government supersede standards in fire codes: consultation with fire agencies.

(1) When the governing body of a county or city adopts specifications and standards, including standards for width, for roads and streets under the jurisdiction of the governing body, such specifications and standards shall supersede and prevail over any specifications and standards for roads and streets that are set forth in a uniform fire code adopted by the State Fire Marshal, a municipal fire department or a county firefighting agency.

(2) This section applies to specifications and standards for roads and streets adopted by the governing body of a county or city in a charter, acknowledged comprehensive plan or ordinance adopted pursuant to ORS chapter 92, 203, 221 or 195.065, 368.039, 478.920, OAR918-480-0100.

(3) Before adopting or amending any comprehensive plan, land use regulation or ordinance that establishes specifications and standards for roads and streets, a governing body of a county or city shall consult with the municipal fire department or other local firefighting agency concerning the proposed specifications and standards. The county or city governing body shall consider the needs of the fire department or firefighting agency when adopting the final specifications and standards.

Dispute Resolution Process

The Office of State Fire Marshal's (OSFM), Dispute Resolution Process allows an aggrieved party to dispute inspection findings of the local fire marshal. This process allows the aggrieved party to ask for a "second opinion" but does not supersede the local or State Fire Marshal's appeal process. The local fire marshal, through the OSFM, arranges a conference call with the aggrieved party and on-call code experts from other jurisdictions and industry. The on-call group discusses the case, and the local fire marshal takes the group's second opinion into consideration when rendering a decision in writing to the aggrieved party. The goal of the OSFM is to conduct the conference call within 48 hours (two business days) for new construction and no more than seven business days for maintenance issues of the notice of dispute. Aggrieved parties who are not satisfied with the findings can appeal the decision to a local appeals board, if available, otherwise to the OSFM.

Preamble/Authority and Scope

The above jurisdictions have elected to administer and enforce the Oregon Fire Code under the authority granted to them by ORS 476.030 or ORS 476.060. The Oregon Fire Code is the International Fire Code, 2021 Edition, as published and copyrighted by the International Code Council, which has been amended and adopted by the Oregon State Fire Marshal's Office. To further the Oregon State Fire Marshal's goal of promoting fire code consistency throughout the state, the above jurisdictions have agreed to reduce local amendments.

Nevertheless, the above jurisdictions have prepared this Applications Guide to provide good faith guidance to building officials, contractors, business owners, the public, and fire marshals on local interpretations and practices that are in compliance with the current adopted 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 Applications Guide does not create or replace code provisions and is not an adopted policy of the above jurisdictions. The reader is cautioned that the guidance detailed in this Applications Guide may or may not apply to their specific situation, and that the designated authority for each jurisdiction retains final authority to determine compliance.

Jurisdiction Contact Information

Aumsville Fire District

490 Church Street
Aumsville, OR 97325
(503)749-2894 office
(503)749-2182 fax
www.aumsvillefire.org

Aurora Fire District

21390 Main Street NE
Aurora, OR 97002
(503)678-5966 office
(503)678-1344 fax
www.aurorafire.org

Drakes Crossing Fire District

19364 Powers Creek Loop NE
Silverton, OR 97381
(503)873-6868 office
www.drakescrossingfire.com

Gates Fire District

140 East Sorbin Street
Gates, OR 97346
(503)897-2842 office
(503)930-1190 fax
www.gatesfd.org

Hubbard Fire District

P.O. Box 378
Hubbard, OR 97032
(503)981-9454 office
chief@hubbardfire.org
870@hubbardfire.com

Idanha-Detroit Fire District

P.O. Box 399
Idanha, OR 97350
(503)854-3494 office
(503)854-3238
www.idanhadetroitfire.com

Jefferson Fire District

189 N. Main Street
Jefferson, OR 97352
(503)327-2822 office
(503)327-2279 fax
www.jeffersonfire.org

Keizer Fire District

661 Chemawa Road NE
Keizer, OR 97303
(503)390-9111 office
(503)390-8299 fax
www.keizerfire.com

Marion County Fire Dist. #1

300 Cordon Road NE
Salem, OR 97301
(503)588-6526 office
(503)588-6537 fax
www.mcfcd1.com

Mill City Fire District

400 S. 1st Avenue
Mill City, OR 97360
(503)897-2390 office
mcrfpd2@wbcable.net

Monitor Fire District

15240 Woodburn-Monitor Rd.
Woodburn, OR 97071
(503)634-2570 office
(503)634-2600 fax
www.monitorfire.com

Mt. Angel Fire District

P.O. Box 335
Mt. Angel, OR 97362
(503)845-2438 office
(503)845-2855 fax
www.mtangelfire.org

Salem Fire Department

370 Trade Street NE
Salem, OR 97301
(503)588-6245 office
(503)588-6371 fax
www.cityofsalem.net

Salem Suburban Fire District

370 Trade Street NE
Salem, OR 97301
(503)581-7788 office

Silverton Fire District

819 Rail Way NE
Silverton, OR 97381
(503)873-5328 office
(503)873-2805 fax
www.silvertonfire.com

St. Paul Fire District

P.O. Box 1
St. Paul, OR 97137
(503)633-4602 office
(503)633-4601 fax
bryan@stpaulfire.org

Stayton Fire District

1988 W. Ida Street
Stayton, OR 97383
(503)769-2601 office
(503)769-1487 fax
www.staytonfire.org

Sublimity Fire District

P.O. Box 911
Sublimity, OR 97385
(503)769-3282 office
(503)769-4579 fax
www.sublimityfire.com

Turner Fire District

P.O. Box 10
Turner, OR 97392
(503)743-2190 office
(503)743-3604 fax
www.turnerfire.com

Woodburn Fire District

1776 Newberg Hwy.
Woodburn, OR 97071
(503)982-2360 office
(503)981-5004 fax
www.woodburnfire.com

Oregon State Fire Marshal

3991 Fairview Industrial Dr. SE
Salem, OR 97302
(503)378-FIRE office
www.oregon.gov/OSFM/

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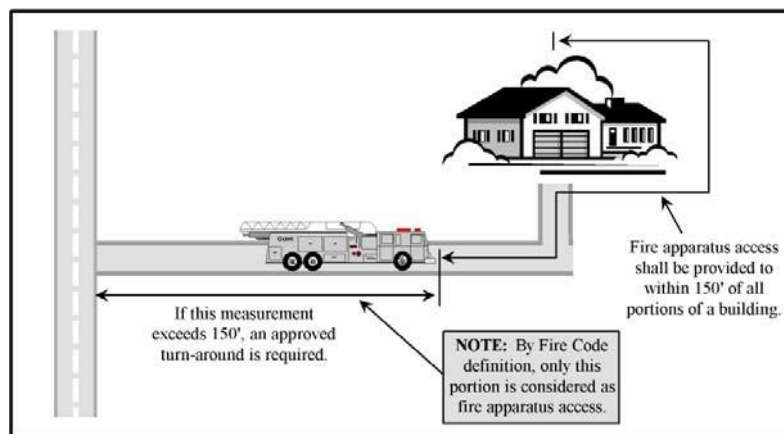
CONSTRUCTION DOCUMENT SUBMITTAL: Construction documents for proposed fire apparatus access, location of fire lanes, security gates across fire apparatus access road and construction documents and hydraulic calculations for fire hydrant system shall be submitted to the fire department for review and approval prior to construction (OFC 501.3).

FIRE APPARATUS ACCESS

Fire Apparatus Access Road Exceptions: The requirements for fire apparatus access may be modified as *approved* by the fire code official where any of the following apply: (OFC 503.1.1 Exceptions)

- 1) Buildings are equipped throughout with an *approved* automatic fire sprinkler system installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3. (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, nonnegotiable grades, or other similar conditions, and an *approved* alternative means of fire protection is provided.
- 3) There are not more than two non-sprinklered one- and two-family dwellings or Group R-3 or Group U occupancies.

Fire Apparatus Access Road Distance from Buildings and Turnarounds: Fire apparatus access roads shall comply with Chapter 5 of the Oregon Fire Code and 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.

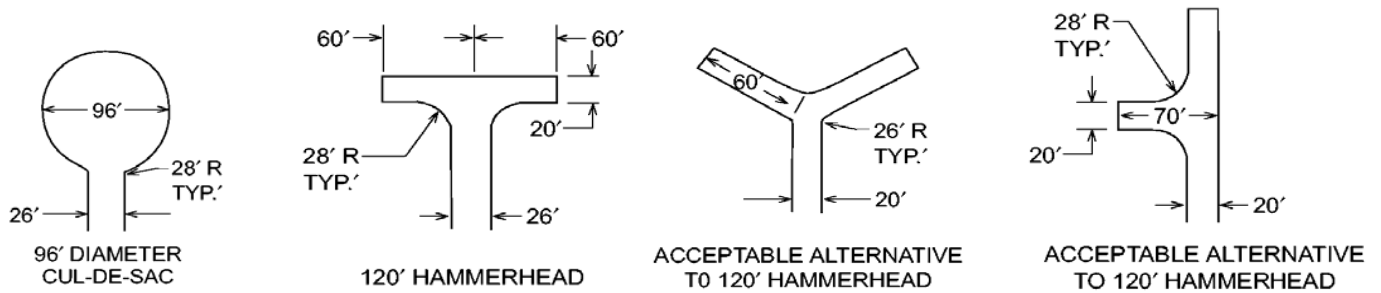


Additional Access: The fire code official is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access (OFC 503.1.2).

Specifications for Access Roads: Fire apparatus access roads shall be installed and arranged in accordance with Chapter 5 of the Oregon Fire Code (OFC 503.2).

Dead End Roads: Dead-end fire apparatus access roads in excess of 150' feet in length shall be provided with an *approved* area for turning around fire apparatus (OFC 503.2.5 & Appendix D).

Diagrams of *approved* turnarounds are shown below: (OFC 503.2.5)



Turning Radius: The required turning radius of a *fire apparatus access road* shall be determined by the *fire code official*. (OFC 503.2.4 & Appendix D)

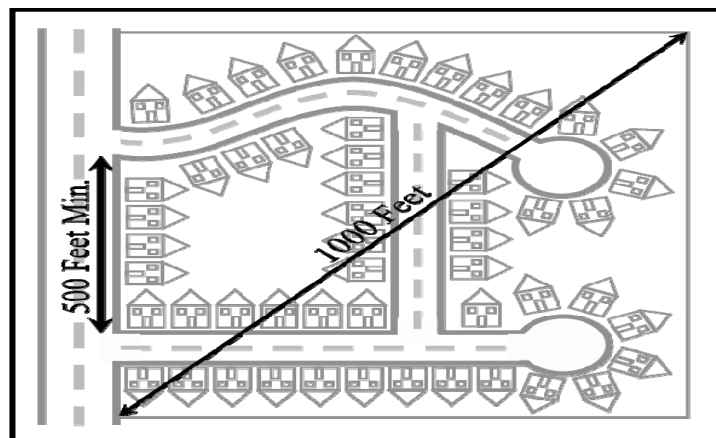
Turnouts: When a fire apparatus access road exceeds 400' feet in length, turnouts 10' feet wide and 30' feet long shall be provided in addition to the required road width and shall be placed no more than 400' feet apart, unless otherwise *approved* by the *fire code official*. These distances may be adjusted based on visibility and sight distances. (OFC Chapter 5)

Multiple Access Roads: Developments of one- and two-family dwellings where the number of *dwelling units* exceeds 30, multiple-family residential projects having more than 100 *dwelling units* and where vehicle congestion, adverse terrain conditions or other factors that could limit access, as determined by the *fire code official*, shall be provided with not less than two *approved* means of access (D106.1 and D107.1).

Exceptions: Projects having up to 200 multiple-family *dwelling units* shall have not fewer than one *approved fire apparatus access road* where all buildings, including nonresidential occupancies, are equipped throughout with *approved automatic sprinkler systems* installed in accordance with OFC Section 903.3.1.1 or 903.3.1.2.

Projects having more than 30 single-family *dwelling units* accessed from 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, access from two directions shall not be required.

Remoteness for Multiple Access Roads: Where two fire apparatus 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. (OFC D104.3, D106.3 & D107.2)



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 (OFC 503.2.7).

Grades steeper than 10 percent as *approved* by the *fire code official*. Intersections and turnarounds shall be level (maximum 5%) with the exception of crowning for water run-off. When fire sprinklers are installed, a maximum grade of 15% may be allowed. The approval of fire sprinklers as an alternate shall be accomplished in accordance with the provisions of ORS 455.610(5). (OFC D103.2) OAR 918-480-0125

Traffic Calming Devices: Traffic calming devices shall be prohibited unless *approved* by the *fire code official* (OFC 503.4.1).

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 (OFC 503.2.8)

Fire Apparatus Access Road Width and Vertical Clearance: Fire apparatus access roads shall have an unobstructed width of not less than 20' feet (26' feet adjacent to fire hydrants), 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. (OFC 503.2.1 & D103.1)

Note: When serving two or less dwelling units and accessory buildings, the driving surface may be reduced to 12' feet, although the unobstructed width shall be 20' feet. Turning radii for curves and turnarounds on reduced width roads shall be not less than 28' feet and 48' feet respectively, measured from the same center point.

Additional Access Roads – Commercial Developments: Buildings or facilities exceeding 30 feet or three stories in height shall have not fewer than two means of fire apparatus access for each structure. Buildings or facilities having a gross building area of more than 62,000 square feet 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 that have a single *approved* fire apparatus access road where all buildings are equipped throughout with approved automatic sprinkler systems. (OFC D104.1 & D104.2)

Fire Apparatus Access Roads with Fire Hydrants: Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26' feet, exclusive of shoulders. (OFC D103.1).

Surface and Load Capacities: Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced to provide all-weather driving capabilities (OFC 503.2.3).

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 weighting up to 75,000 pounds (OFC D102.1).

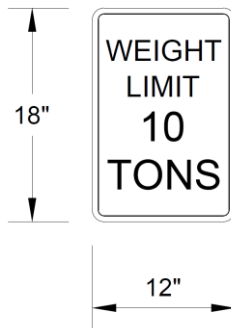
Aerial Fire Apparatus Roads: Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet, *approved* aerial fire apparatus access roads shall be provided. For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the

top of the parapet walls, whichever is greater. Aerial apparatus roads shall have an unobstructed driving surface width of not less than 26 feet in the immediate vicinity of the building or portion thereof.

One or more of the required access routes meeting this condition shall be located not less than 15 feet and not greater than 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 fire apparatus access road is positioned shall be *approved* by the fire code official.

Overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the fire code official. (OFC D105.1, D105.2, D105.3 & D105.4)

Bridges and Elevated Surfaces: Where a bridge or 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. (OFC 503.2.6)



1. Signs shall be a minimum of 18"x12", 18-gauge steel sign, reflective white in color with black letters a minimum of 3-1/2-inches in height with a 3/8-inch stroke.
2. Signs shall be installed with a clear space above grade at a level of 7-feet.
3. The bridge weight limit as determined by a State of Oregon registered civil or structural engineer shall appear above the word "TONS".

Gates: Gates securing the fire apparatus roads shall comply with all the following criteria: (OFC 503.5 and D103.5)

- Where a single gate is provided, the gate width shall be not less than 20 feet. Where a fire apparatus road consists of a divided roadway, the gate width shall be not less than 12 feet.
- Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.
- 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 F2200.
- Gates shall be set back at minimum of 30 feet from the intersecting roadway.
- Gates shall be of the horizontal swing, horizontal slide, vertical lift, or vertical pivot type.
- Construction of gates shall be of materials that allow manual operation by one person.
- 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*.
- Methods of locking shall be submitted for approval by the *fire code official*.

Signs: Where required by the fire code official, fire apparatus access roads shall be marked with permanent, "NO PARKING – FIRE LANE" signs complying with figures below. Signs shall have

a minimum dimension of 12 inches wide by 18” 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. (OFC D103.6).

- D103.6.1: Roads 20 to 26-feet in width shall be posted on both sides of fire apparatus access roads.
- D103.6.2: Roads more than 26-feet in width shall be posted on one side of the fire apparatus access roads.



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. (OFC 503.3)

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 Sections 503.2.1 and 503.2.2 shall be maintained at all times. (OFC 503.4).

FIREFIGHTING WATER SUPPLIES

Required Water Supply: An *approved* water supply capable of supplying the required fire flow for fire protection shall be provided to premises on which facilities, buildings or portions of buildings are hereafter constructed or moved into or with the jurisdiction. See Appendix D108, “Uniform Alternate Construction Standard for One- and Two-family Dwellings.”

Fire-Flow Calculation Area: 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 by area separations (OFC B104.2) and Type IA and IB Construction (OFC B104.3). (OFC B104.1).

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.

Fire-Flow Requirements for Buildings in Protected Areas with Adequate and Reliable Water Systems (Section B105):

- **Commercial Buildings – Fire Flow:** The minimum fire flow and flow duration for buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.1(2) and B105.2. (OFC B105.2).
- **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 at 20 pounds per square inch residual pressure, as specified in Table B105.2, or exceeds the available *fire flow* at the site of the structure. (OFC

B106.2)

- **Single Family Dwellings, Group R-3 and R-4 – Required Fire Flow:** The minimum fire flow and flow duration requirements for one and two- family dwellings, Group R-3 and R-4 buildings and townhouses shall be 1,000 gallons per minute at a flow duration of 1 hour when structure has a fire flow area of 0 – 3,600 square feet. When the structure(s) is (are) 3,600 square feet or larger, the required fire flow shall be determined according to OFC Appendix B. (OFC Table B105.1(1) and B105.1(2))

Fire-Flow Requirements for Buildings in Protected Areas without Adequate and Reliable Water 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 (see examples on pages ___ and ___), the *International Wildland-Urban Interface Code* or the *ISO Guide for Determining Needed Fire Flow*. (OFC B107)

Modifications: Decrease – the *fire code official* is authorized to reduce the *fire flow* where the development of full fire floor 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. (OFC B103.1). **Increase** – the *fire code official* is authorized to increase the *fire-flow* requirements where conditions indicate an unusual susceptibility to group fire or conflagrations. An increase shall be not more than twice that required for the building under consideration. (OFC B103.2)

Fire Service Features and Timing of Installation: Where fire apparatus access roads or a water supply for fire protection are required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction except where *approved* alternative methods of protection are provided. (OFC 501.4)

Address Identification: New and existing buildings shall be provided with *approved* address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Address identification characters shall contrast with their background. Address numbers and shall be Arabic numbers or alphabetical letters. Each character shall be not less than 4 inches high with a minimum stroke width of ½ inch. Where required by the *fire code official*, address identification shall be provided in additional *approved* locations to facilitate emergency response. 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. Address identification shall be maintained. (OFC 505.1)

- Consult with local fire jurisdictions within Marion County for established “Address Sign Program” requirements.
- Consult with the local city or county development code for additional or alternative requirements.
- Consult with local fire jurisdictions or City/County development codes for requirements of large apartment complexes (4 or more buildings).

FIRE HYDRANTS

Fire Hydrants – Commercial Buildings/Developments: Where a portion of the facility or building hereafter constructed or moved into or within the fire jurisdiction 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 facility or building, on-site fire hydrants and mains shall be provided where required by the *fire code official*. (OFC 507.5.1).

Note: This distance may be increased to 600' feet for buildings equipped throughout with an *approved* automatic sprinkler system installed in accordance with 903.3.1.1 or 903.3.1.2.

Fire Hydrants – Group R-3 and Group U Occupancies: For Group R-3 and Group U Occupancies, the distance requirement shall be 600 feet. (OFC 507.5.1 exception)

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 C102.1. (OFC Appendix C)

**TABLE C102.1
NUMBER AND DISTRIBUTION OF FIRE HYDRANTS^h**

FIRE-FLOW REQUIREMENT	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS ^{a,b,c,f,g} (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT ^{d,f,g}
1,750 or less	1	500	250
1,751 – 2,250	2	450	225
2,251 – 2,750	3	450	225
2,751 – 3,250	3	400	225
3,251 – 4,000	4	350	210
4,001 – 5,000	5	300	180
5,001 – 5,500	6	300	180
5,501 – 6,000	6	250	150
6,001 – 7,000	7	250	150
7,001 or more	8 or more ^e	200	120

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

- a. Reduce by 100 feet for dead-end streets or roads.
- b. Where streets are provided with median dividers that cannot be crossed by fire fighters 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.
- c. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.
- d. Reduce by 50 feet for dead-end streets or roads.
- e. One hydrant for each 1,000 gallons per minute or fraction thereof.
- f. A 50-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 (NFPA 13) of the *International Fire Code*.
- g. A 25-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2 (NFPA 13R) or 903.3.1.3 (NFPA 13D) of the *International Fire Code* or Section P2904 of the *International Residential Code*.
- h. The fire code official is authorized to modify the location, number and distribution of fire hydrants based on site-specific constraints and hazards.

Fire Hydrant Spacing: (OFC Appendix C103)

- Fire apparatus access roads and public streets providing required access to building in accordance with Section 503 shall be provided with one or more fire hydrants, as determined by OFC Section C102.1. Where more than one fire hydrant is required, the distance between the required fire hydrants shall be in accordance with OFC Sections

C103.2 and C103.3.

- Existing fire hydrants on public streets are allowed to be considered as available to meet the requirements of OFC C102 and C103.
- 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 code official.
- Consult with local fire jurisdiction for the placement of hydrants at apartment or industrial complexes. The first hydrant(s) to be placed shall be at the primary access and any secondary access to the site. After these hydrants have been placed other hydrants shall be sited to meet the above requirements for spacing and minimum number of hydrants.

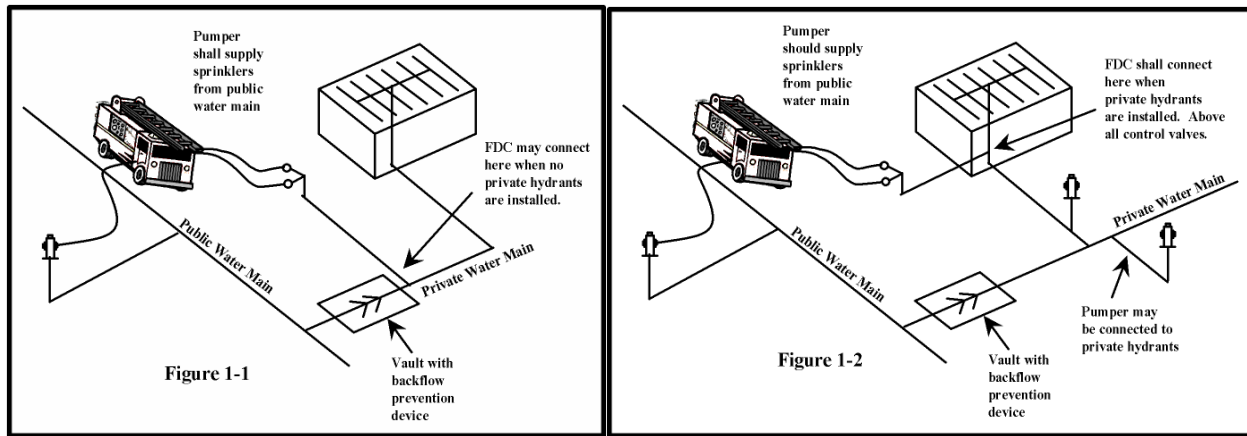
Fire Hydrant Distance from an Access Road: Fire hydrants shall be located not more than 15' feet from an approved fire apparatus access roadway unless approved by the fire code official. (OFC Appendix C)

Physical Protection: Where fire hydrants are subject to impact by a motor vehicle, guard post, bollards or other *approved* means of protection shall be provided. (OFC 312 and 507.5.6)

Clear Space Around Hydrants: A 3-foot clear space shall be maintained around the circumference of the fire hydrant, except as otherwise required or *approved*. (OFC 507.5.5)

Fire Department Connections: Fire department connections shall be installed and maintained in accordance with OFC Section 912. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of the fire department connections shall be *approved* by the *fire code official*. (OFC 912.2)

- **Visible Location:** Fire department connections shall be located on the street side of buildings or facing approved fire apparatus access roads, fully visible and recognizable from the street, fire apparatus access road or nearest point of fire department vehicle access or as otherwise *approved* by the *fire code official*. (OFC 912.2.1)
- **Clear Space Around FDC's:** A working space of not less than 36-inches in width, 36-inches in depth and 78-inches in height shall be provided and maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or *approved* by the *fire code official*. (OFC 912.4.2).
- **Physical Protection:** Where fire department connections are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312. (OFC 912.4.3).



KEY BOXES & FIRE PROTECTION EQUIPMENT ACCESS

Key Box: A key box for building access may be required. Please contact the appropriate fire jurisdiction for location requirements, an order form and instructions regarding installation and placement. (OFC 506)

Fire Protection and Utility Equipment Identification and Access: Fire protection equipment shall be identified in an *approved* manner. Rooms containing controls for air-conditioning systems or *fire protection systems* shall be identified for the use of the fire department. *Approved* with signs required to identify *fire protection system* equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible. (OFC 509.1)

Emergency Radio Coverage

Emergency Responder Communication Coverage in New Buildings: Approved in-building, two-way emergency responder communication coverage for emergency responders shall be provided in all new buildings as described in OFC Section 510.1.1. In-building, two-way emergency responder communication coverage within the building shall be based on upon the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. (OFC 510.1)

Emergency Responder Communication Coverage in Existing Buildings:

- Existing buildings shall be provided with *approved* in-building, two-way emergency responder communication coverage for emergency responders as required in OFC Chapter 11. (OFC 510.2 & 1103.2)
- Existing buildings other than Group R-3, that do not have *approved* in-building, two-way emergency response communication coverage for emergency responders in the building based on existing coverage levels of the public safety communication systems, shall be equipped with such coverage according to one of the following:
 - 1. Where an 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.

SYSTEMS OUT OF SERVICE (FIRE WATCH):

Fire Watch: Where a required *fire protection system* is out-of-service, the fire department and

the *fire code official* shall be notified immediately and, and where required by the *fire code official*, the building shall either be evacuated, or an approved fire watch shall be provided for all occupants left unprotected by the shutdown until the *fire protection system* has been returned to service. Where utilized, fire watches shall be provided with not less than one *approved* means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and deep watch for fires. Fire watch is defined as a temporary measure intended to ensure continuous and systematic surveillance of a building or portion thereof by one or more qualified individuals for the purposes of identifying and controlling fire hazards, detecting early signs of unwanted fire, raising an alarm of fire, and notifying the fire department. Fire watch requirements are as follows:

- Personnel assigned to Fire Watch shall be provided with not less than one approved means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires. (OFC 907.1).
- The structure or portions thereof shall be checked for fire hazards every 15 minutes or as required by the *fire code official*.
- Dedicated person(s) shall meet the requirements of Appendix T, Section T103.2.
- Facilities with an *approved* notification and impairment management program. The notification and impairment program for water-based *fire protection system* shall comply with NFPA 25.

When in doubt about if a system is required or if a fire watch is needed, contact the local Fire Marshal's Office for consultation and or response. (OFC 901.7 & Appendix T)

Documentation: The *fire code official* may use Figure T104.1A to order a *fire watch* and require Figure T104.1B to be used by *fire watch* personnel as documentation of the duty. (OFC T104.1)

Termination of Fire Watch: A *fire watch* shall continue until the initiating circumstances have been abated and the fire code official has approved its termination. (OFC T103.6)

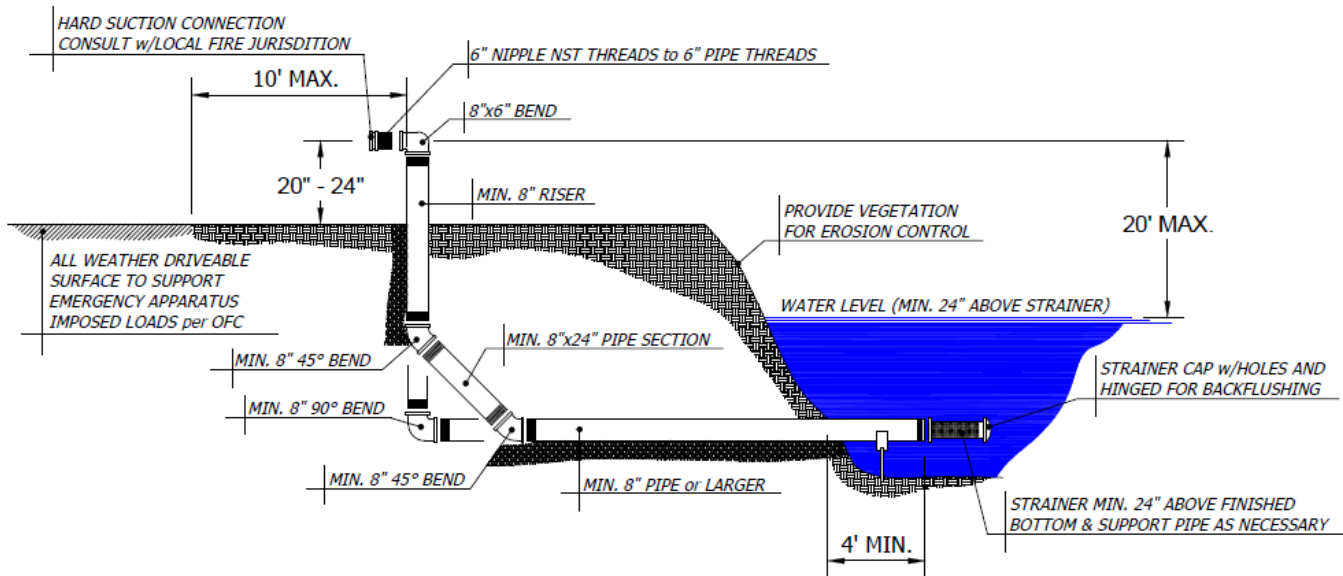
Fire Watch Examples:

1. The automatic smoke detection system in the Primary School, Middle School or High School was taken off-line due to unwanted false alarms and an alarm technician has been dispatched to evaluate the system. This is a required detection system, and the students occupy the building. Immediate notification to the fire jurisdiction is required and a fire watch is required and could be conducted by staff and or security personnel.
2. The manual fire alarm system at a local Elementary School is initiating false alarms and is taken offline by school district personnel; the automatic smoke detection and fire sprinkler system are operational. It's Saturday afternoon and the building is not occupied. Although this is a required system, a fire watch is not required as the building is vacant.
3. The water main that serves a local apartment complex is damaged in a construction accident rendering the fire hydrants and residential fire sprinkler systems out-of-service. It's Sunday night and nearly all the apartments are occupied. Both systems are required. All apartments must be evacuated, or a continuous fire watch shall be required and continued until repairs have been completed and *approved*.

Common Definitions:

1. **AGENCY.** Any emergency responder department within the jurisdiction that utilizes radio frequencies for communication. This could include, but not be limited to, various public safety agencies such as fire departments, emergency medical services and law enforcement.
2. **APPROVED.** Acceptable to the *Fire Code Official*.
3. **AUTOMATIC FIRE SPRINKLER SYSTEM.** An automatic sprinkler system, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.
4. **DWELLING UNITS.** A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.
5. **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.
6. **FIRE CHIEF.** The State Fire Marshal, Deputy State Fire Marshal, the chief officer of the fire department serving the jurisdiction, or a duly authorized representative.
7. **FIRE CODE.** *Oregon Fire Code*
8. **FIRE CODE OFFICIAL.** The *fire chief* or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.
9. **FIRE FLOW.** The flow rate of water supply, measured at 20 pounds per square inch (psi) residual pressure, that is available for firefighting.
10. **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.
11. **INTERNATIONAL FIRE CODE.** Means the *Oregon Fire Code (OFC)* as adopted by OAR 837-040-0010.
12. **OREGON FIRE CODE.** Means all Oregon fire protection statutes and the administrative rules of the State Fire Marshal adopted in accordance with ORS 476.030(1). The 2022 Oregon Fire Code is based upon the 2021 *International Fire Code*, with Oregon amendments as adopted October 1, 2022, and hereinafter referred to as "the code".
13. **TRAFFIC CALMING DEVICES.** Traffic calming devices are design elements of fire apparatus access roads such as street alignment, installation of barriers, and other physical measures intended to reduce traffic and cut-through volumes, and slow vehicle speeds.

DRY HYDRANT EXAMPLE



Frost-free Depth: Frost-free depth shall be measured from mid-line of the hard suction connection to the water level line and be a maximum of 15-feet with 10-feet or less preferred.

Dry Hydrant Construction:

Dry hydrant systems shall be designed, constructed and supported by approved engineering design practices and in accordance with NFPA 1142 Chapter 8, 2017 edition.

Preferred construction of the dry hydrant assembly includes no more than two 90-degree bends. A wide-sweep bend can also be utilized in the construction of the dry hydrant.

Consultation with the Local Fire Jurisdiction for each dry hydrant site should be evaluated prior to construction to determine the best way the water supply can be utilized effectively.

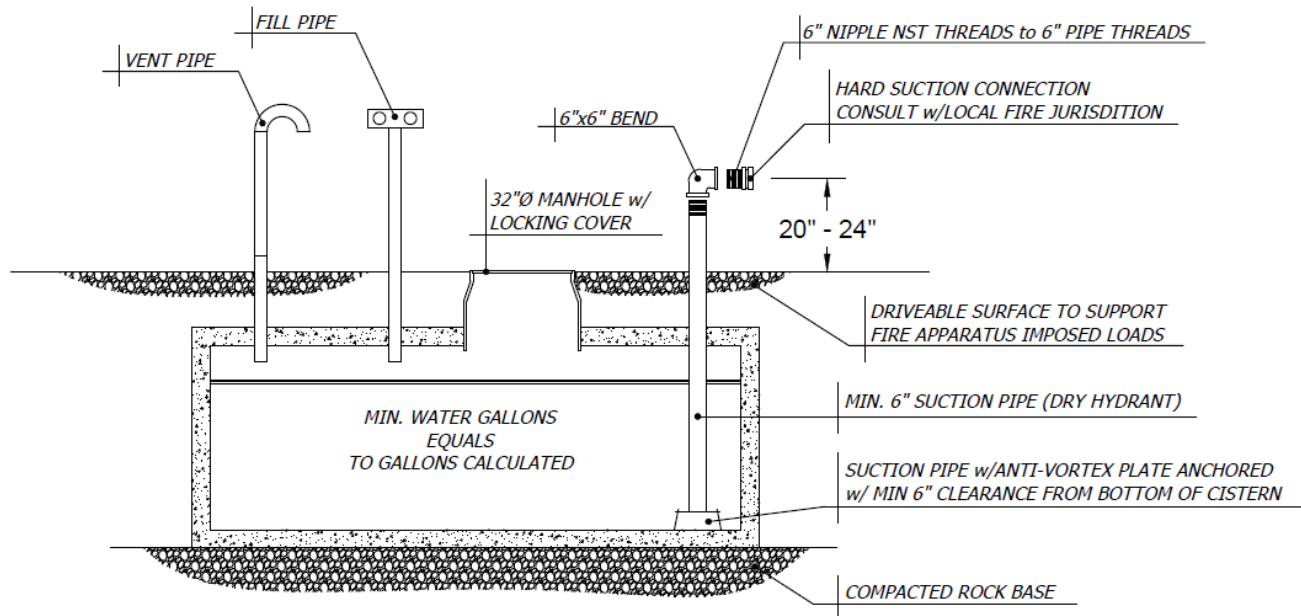
Metal piping and exposed PVC pipe surfaces should be primed and painted to prevent deterioration.

Accessibility: The water supply source shall be maintained and accessible on a year-round basis.

Capacity: Acceptable water supply sources shall maintain the minimum capacity and delivery requirements on a year-round basis, based on the 50-year drought for the water source.

ry Hydrant Testing:

CISTERN EXAMPLE



Cistern Construction:

Cistern construction is governed by local conditions of soil and material availability. Some engineering considerations for cisterns include the following:

- The base, walls and roof should be designed for highway loading and for the prevailing soil conditions.
- If groundwater conditions are high, the cistern should not float when it is empty.
- Suction piping should be designed to minimize whirlpooling.
- Vent piping should be sufficient size to allow drafting from the cistern at the maximum capability permitted by the suction piping.

Cisterns should have a minimum usable volume of water as determined by the AHJ and methods outlined in Chapter 4 of NFPA 1142, 2017 edition.

The water level of a cistern can be maintained by rainfall, water pumped from a well, water hauled by a mobile water supply apparatus, or a seasonal high water of a stream or river.

Preferred construction of the dry hydrant assembly includes no more than two 90-degree bends. A wide-sweep bend can also be utilized in the construction of the dry hydrant.

Consultation with the Local Fire Jurisdiction for each cistern site should be evaluated prior to construction to determine the best way the water supply can be utilized effectively.

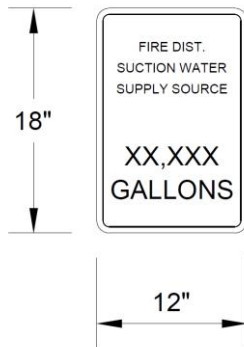
The top of cisterns should be a minimum of 2-feet below grade, capped for safety, but they should have openings to permit inspections and use of hard suction hose when needed.

Cistern Specifications:

Cistern specifications that are listed within Annex B.4.3 of NFPA 1142, 2017 edition should be followed. Designer shall consult with local Fire Jurisdictions.

Cistern Signage:

Provide signage and attached to the suction pipe (dry hydrant) providing the following information:



Sign shall be a 12" wide by 18" high and shall have red letters on a white reflective background.

Suction Pipe (Dry Hydrant) Specifications:

The suction pipe shall be ASTM international Schedule 40 Steel or other approved material.

The suction pipe shall be between 20" – 24" above the final grade, measured to the center of the hard suction connection.

The suction piping system must be capable of delivering 1,000 gpm.

The suction piping system shall be a minimum of 6" piping with 6" nipple with NST threads to a 6" with pipe threads to accommodate the Hard Suction Connection specified by the local fire jurisdiction.

The bottom of the suction pipe to the hard suction connection must not exceed 14-foot vertical distance.

Fill Pipe Specifications:

Fill pipe shall be a minimum of 2-1/2" size piping with (2)2-1/2" female swivel connections with NST threads and end caps. Similar design to a fire department connection.

Fill pipe shall be a minimum of 36" above the final grade.

Vent Pipe Specifications:

Vent pipe should be a minimum of 2" inside diameter steel pipe with a bug screen.

Vent pipe shall be a minimum of 36" above final grade.

NFPA 1142 Residential Sample Calculation

- WS_{min} = Water Supply
- VS_{tot} = Total volume of structure in ft^3
- OHC = Occupancy Hazard Classification number (NFPA 1142 Chapter 5)
- CC = Construction Classification number (NFPA 1142 Chapter 6)
- *Exposure Hazard* = 100 sq. ft. or larger and within 50' of main structure or the structure is OHC of 3 or 4, within 50' of main structure, regardless of size.

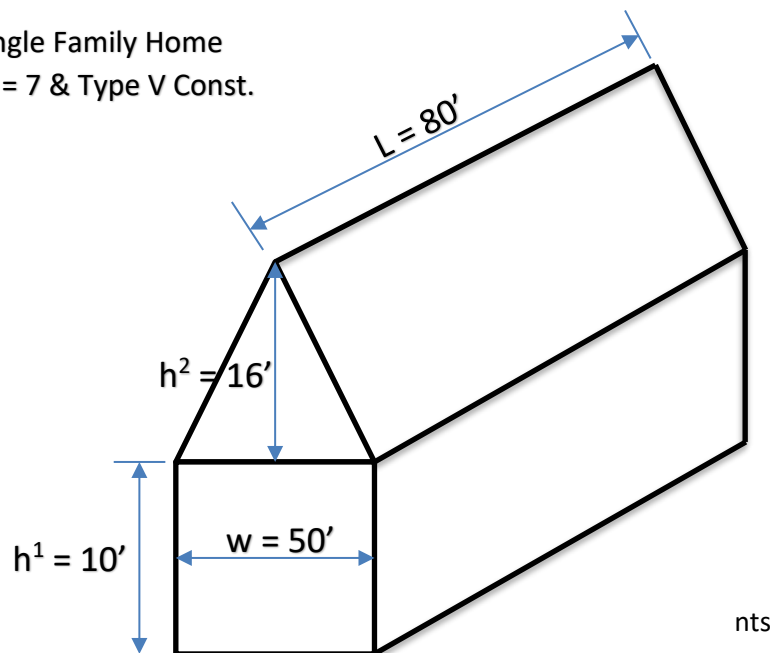
$$WS_{min} = \frac{VS_{tot} \times (CC)}{OHC}$$

Structures w/o Exposure Hazard

$$WS_{min} = \frac{VS_{tot} \times (CC)(1.5)}{OHC}$$

Structures w/Exposure Hazard

Single Family Home
OHC = 7 & Type V Const.



Volume of rectangle = $(w)(h^1)(L) = 50' \times 10' \times 80' = 40,000$ cu. Ft.

Area of triangle = $(w)(h^2)1/2 = 50' \times 16' \times .5 = 400$ sq. ft.

Volume of triangle = (total area)(L) = 400 sq. ft.(80') = 32,000 cu. ft.

Exposure Hazard = none

$$WS_{min} = \frac{40,000 \text{ cu. ft.} + 32,000 \text{ cu. ft.}}{7} (1.0) = \mathbf{10,286 \text{ gallons (minimum on-site water)}}$$

Note: The AHJ shall be permitted to reduce the water supply required by NFPA 1142 for manual firefighting purposes when the structure is protected by an automatic sprinkler system that fully meets the requirements of NFPA 13, NFPA 13D or NFPA 13R.

NFPA 1142 Commercial Sample Calculation

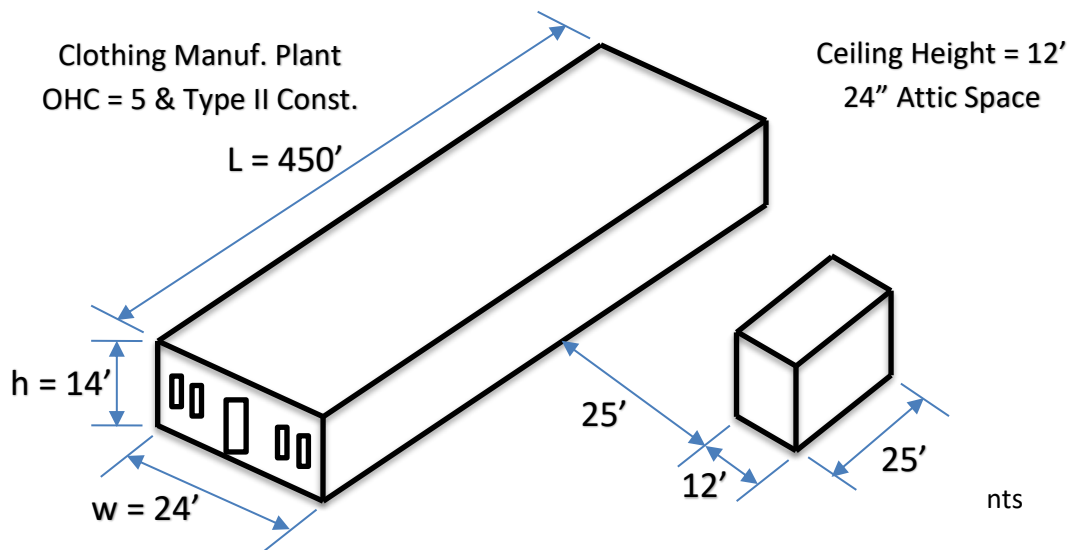
- WS_{min} = Water Supply
- VS_{tot} = Total volume of structure in ft^3
- OHC = Occupancy Hazard Classification number (NFPA 1142 Chapter 5)
- CC = Construction Classification number (NFPA 1142 Chapter 6)
- *Exposure Hazard* = 100 sq. ft. or larger and within 50' of main structure or the structure is OHC of 3 or 4, within 50' of main structure, regardless of size.

$$WS_{min} = \frac{VS_{tot} \times (CC)}{OHC}$$

Structures w/o Exposure Hazard

$$WS_{min} = \frac{VS_{tot} \times (CC)(1.5)}{OHC}$$

Structures w/Exposure Hazard



Area of rectangle = $(w)(L) = 24' \times 450' = 10,800$ sq. ft. (less than 12,000 sq. ft. no sprinkler requirement per building code)

Volume of rectangle = Total Area(h) = $10,800$ sq. ft. $\times 14' = 151,200$ cu. ft. (volume of building includes attic space)

Exposure Hazard = Yes, within 50' and greater than 120 sq. ft. ($12' \times 25' = 300$ sq. ft.)

$$WS_{min} = \frac{151,200 \text{ cu. ft.} \times (0.75)(1.5)}{5} = \mathbf{34,020 \text{ gallons (minimum on-site water)}}$$

Note: The AHJ shall be permitted to reduce the water supply required by NFPA 1142 for manual firefighting purposes when the structure is protected by an automatic sprinkler system that fully meets the requirements of NFPA 13, NFPA 13D or NFPA 13R.