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 (m^2), 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 fire-flow 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 alternate provisions regarding limiting fire flows.

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

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.

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 the percentage of the floor area used for each hazard. The proportioned building fire-flow shall by multiplied by the factor, relating to that portion of the building, in Table B105.4 and totaled to determine the total required fire flow.

Table B105.4

Light Hazard Occupancies	0.75
Ordinary Hazard (Group 1)	0.85
Ordinary Hazard (Group 2) and HPCS[a] Class I & II	1.00
Extra Hazard (Group 1) and HPCS Class III	1.15
Extra Hazard (Group 2) and HPCS Class IV & High Hazard	1.25

HPCS[a]- 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 Wildland-Urban Interface Code* or the ISO, *Guide for Determining Needed Fire Flow, 2005 Edition*.

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

SECTION B109
REFERENCED STANDARDS

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

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

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[c]	FLOW DURATION (hours)
Type IA and IB[b]	Type IIA and IIIA[b]	Type IV and V-A[b]	Type IIB and IIIB[b]	Type V-B[b]		
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 m^2, 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.