

# Site Design Requirements for Fire Department Apparatus Access and Water Supplies

The intent of this document is to provide designers with commonly referenced Fire Code requirements and policies regulating the design of sites within the jurisdiction of the Bismarck Fire Department. The fire department's site plan review and approval is largely based on the requirements and underlying concepts contained within.

This document is organized into two general subject areas: Apparatus Access and Water Supplies. Each subject area includes the excerpts of the fire code section, followed by the department policy used to supplement that code section.

The Department also highly recommends an OSHA publication, Fire Service Features of Buildings and Fire Protection Systems. Chapter 2 of the manual contains an excellent background primer on site plan aspects for fire protection.

Please contact the Fire Marshal if you have questions regarding these requirements. Fire Marshal Ron Kunda can be reached at 701-355-1410 or by email at [rkunda@bismarcknd.gov](mailto:rkunda@bismarcknd.gov). Fire Marshal Owen Fitzsimmons can be reached at 701-355-1422 or by email at [ofitzsimmons@bismarcknd.gov](mailto:ofitzsimmons@bismarcknd.gov).

*Bismarck Fire Department Site Design excerpts from 2015 International Fire Code.*

# IFC Section 503 Fire Apparatus Access Road

## DEFINITIONS

The following words and terms shall, for the purposes of this chapter and as 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.

**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.

### 503.1 Where required.

Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through 503.1.3.

#### 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.

#### **Exceptions:**

1. The *fire code official* is authorized to increase the dimension of 150 feet (45 720 mm) where any of the following conditions occur:
  - 1.1. 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.
  - 1.2. 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.
  - 1.3. There are not more than two Group R-3 or Group U occupancies.
2. Where approved by the *fire code official*, fire apparatus access roads shall be permitted to be exempted or modified for solar photovoltaic power generation facilities.

#### 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 32.

## 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 require or permit modifications to the required access widths where they are inadequate for fire or rescue operations or where necessary to meet the public safety objectives of the jurisdiction.

### 503.2.3 Surface.

Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus, shall be surfaced so as to provide all weather driving capabilities, and shall meet the specifications of the City Engineering Department.

### 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 where required by the *fire code official*. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces that are not designed for such use, *approved* barriers, *approved* signs or both shall be installed and maintained where 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 Sections 503.2.1 and 503.2.2 shall be maintained at all times.

##### 503.4.1. Traffic calming devices.

Traffic calming devices shall be prohibited unless *approved* by the *fire code official*.

#### 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.

Where 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.

# FIRE APPARATUS ACCESS ROADS

The provisions contained in this document are adopted from Appendix D of the 2015 International Fire Code (IFC) and is the policy used by the Bismarck Fire Department in applying the provisions of IFC Section 503 – Fire Apparatus Access Roads.

## 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*.

## SECTION D102 - REQUIRED ACCESS

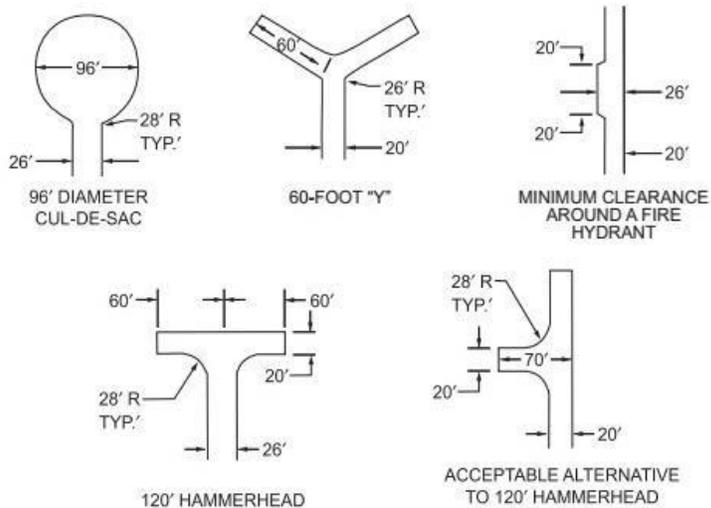
### D102.1 Access and loading.

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 75,000 pounds (34 050 kg).

## 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).



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*.

### D103.4 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 <a href="#">Figure D103.1</a>
501-750	26	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with <a href="#">Figure D103.1</a>
Over 750		Special approval required

For SI: 1 foot = 304.8 mm.

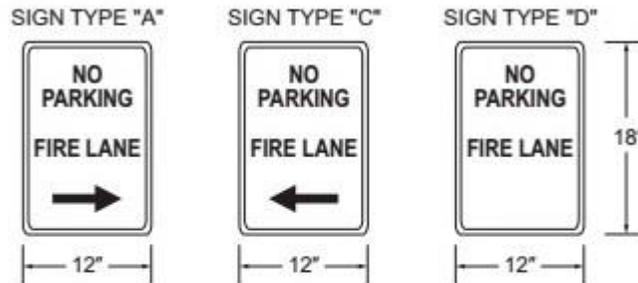
### D103.5 Fire apparatus access road gates.

Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1. Where a single gate is provided, the gate width shall be not less than 20 feet (6096 mm). Where a fire apparatus road consists of a divided roadway, the gate width shall be not less than 12 feet (3658 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. Methods of locking shall be submitted for approval by the *fire code official*.
7. Electric gate operators, where provided, shall be *listed* in accordance with UL 325.
8. 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.



**FIGURE D103.6**  
**FIRE LANE SIGNS**

#### D103.6.1 Roads 20 to 26 feet in width.

Fire lane signs as specified in Section D103.6 shall be posted on both sides of fire apparatus access roads that are 20 to 26 feet wide (6096 to 7925 mm).

#### D103.6.2 Roads more than 26 feet in width.

Fire lane signs as specified in Section D103.6 shall be posted on one side of fire apparatus access roads more than 26 feet wide (7925 mm) and less than 32 feet wide (9754 mm).

## 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 m<sup>2</sup>) 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 m<sup>2</sup>) 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 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 lot or area to be served, measured in a straight line between accesses.

## SECTION D105 - AERIAL FIRE APPARATUS ACCESS ROADS

### D105.1 Where required.

Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet (9144 mm), 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 parapet walls, whichever is greater.

### 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 the building or portion thereof.

### 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. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the *fire code official*.

### D105.4 Obstructions.

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*.

## 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*.

D106.3 Remoteness.

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.

## SECTION D107 - ONE- OR TWO-FAMILY RESIDENTIAL DEVELOPMENTS

D107.1 One- or two-family dwelling residential developments.

Developments of one- or two-family dwellings where the number of *dwelling units* exceeds 30 shall be provided with two separate and *approved* fire apparatus access roads.

### **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*.

D107.2 Remoteness.

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.

## SECTION D108 - REFERENCED STANDARDS

<a href="#">ASTM F 2200—13</a>	<a href="#">Standard Specification for Automated Vehicular Gate Construction</a>	<a href="#">D103.5</a>
ICC IFC—15	International Fire Code	<a href="#">D101.1</a> , <a href="#">D107.1</a>
<a href="#">UL 325—02</a>	<a href="#">Door, Drapery, Gate, Louver, and Window Operators and Systems, with Revisions through June 2013</a>	<a href="#">D103.5</a>

## IFC 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.

### 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.

#### 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).

#### 507.5.1.1 Hydrant for standpipe systems.

Buildings equipped with a standpipe system installed in accordance with Section 905 shall have a fire hydrant within 100 feet (30 480 mm) of the fire department connections.

**Exception:** The distance shall be permitted to exceed 100 feet (30 480 mm) where *approved* by the *fire code official*.

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. Records of tests and required maintenance shall be maintained.

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 of 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.

Records of inspections, testing and maintenance shall be maintained.

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*.

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.

# FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this document are adapted from Appendix B of the 2015 International fire Code (IFC) and is the policy used by the Bismarck fire department in applying the provisions of IFC Section 507 – Fire Protection Water Supply.

## 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. This appendix does not apply to structures other than buildings.

## 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 firefighting.

**FIRE-FLOW CALCULATION AREA.** The floor area, in square feet (m<sup>2</sup>), used to determine the required fire flow.

## SECTION B103 - MODIFICATIONS

### B103.1 Decreases.

The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

### B103.2 Increases.

The fire chief 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 Areas without water supply systems.

For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code*.

## SECTION B104 - FIRE-FLOW CALCULATION AREA

### B104. 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 B104.3.

### B104.2 Area separation.

Portions of buildings which are separated by *fire walls* without openings, 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

### B105.1 One- and two-family dwellings, Group R-3 and R-4 buildings and townhouses.

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 as specified in Tables B105.1(1) and B105.1(2).

**TABLE B105.1(1)**  
**REQUIRED FIRE-FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES**

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE-FLOW (gallons per minute)	FLOW DURATION (hours)
0-3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in <a href="#">Table B105.1(2)</a>	Duration in <a href="#">Table B105.1(2)</a> at the required fire-flow rate
0-3,600	<a href="#">Section 903.3.1.3 of the International Fire Code</a> or <a href="#">Section P2904 of the International Residential Code</a>	500	1/2
3,601 and greater	<a href="#">Section 903.3.1.3 of the International Fire Code</a> or <a href="#">Section P2904 of the International Residential Code</a>	1/2 value in <a href="#">Table B105.1(2)</a>	1

For SI: 1 square foot = 0.0929 m<sup>2</sup>, 1 gallon per minute = 3.785 L/m.

**TABLE B105.1(2)**  
**REFERENCE TABLE FOR TABLES B105.1 AND B105.2**

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW [gallons per minute]	FLOW DURATION [minutes]
Typ I and III	Typ II A and II A'	Typ IV and V A*	Typ I B and II B'	Typ S*		
0-22,700	12,100	10,000	0-1,000	0-3,600	1,000	2
22,701-102,000	12,701-14,000	8,201-10,900	5,100-7,900	3,601-4,800	1,750	
31,201-103,100	17,001-21,100	10,901-12,300	7,100-8,300	4,001-4,200	2,000	
33,701-183,300	21,801-24,200	12,901-17,100	9,801-12,600	5,100-7,700	2,250	
43,101-190,000	24,201-24,200	17,401-21,300	12,601-15,400	1,701-9,400	2,500	
59,001-70,900	24,201-29,700	22,301-25,500	15,101-18,400	9,011-11,300	2,750	
105,001-130,000	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	3,000	3
33,701-103,100	17,001-21,100	10,901-12,300	21,010-20,900	13,101-15,600	3,250	
105,001-130,000	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	3,000	
112,701-142,100	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	3,750	
178,701-183,300	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	4,010	
145,301-164,200	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	4,250	
178,701-183,300	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	4,010	4
145,301-164,200	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	4,250	
178,701-183,300	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	4,010	
183,401-200,700	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	4,700	
203,701-225,200	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	5,000	
225,201-247,700	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	5,250	
247,701-271,200	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	5,000	
271,201-295,900	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	5,750	
295,901 Greater	25,101-41,100	17,101-17,100	18,101-20,900	11,401-14,600	5,000	
—	—	17,101-17,100	18,101-20,900	11,401-14,600	5,000	
—	—	125,501-135,500	20,901-20,900	14,601-17,200	5,000	
—	—	145,001-150,700	20,901-20,900	14,601-17,200	7,000	
—	—	167,901-119,100	20,901-20,900	14,601-17,200	7,000	
—	—	119,401-140,000	20,901-20,900	14,601-17,200	7,750	
—	—	138,101-138,100	20,901-20,900	14,601-17,200	8,000	

For SI: 1 square foot = 0.0929 m<sup>2</sup>; 1 gallon per minute = 3.785 L/min; 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.

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses.

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 B105.2 and B105.1(2).

**TABLE B105.2**  
**REQUIRED FIRE-FLOW FOR BUILDINGS OTHER THAN ONE- AND**  
**TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES**

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE-FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in <a href="#">Table B105.1(2)</a>	Duration in <a href="#">Table B105.1(2)</a>
<a href="#">Section 903.3.1.1</a> of the <i>International Fire Code</i>	25% of the value in <a href="#">Table B105.1(2)</a> <sup>a</sup>	Duration in <a href="#">Table B105.1(2)</a> at the reduced flow rate
<a href="#">Section 903.3.1.2</a> of the <i>International Fire Code</i>	25% of the value in <a href="#">Table B105.1(2)</a> <sup>b</sup>	Duration in <a href="#">Table B105.1(2)</a> at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m.

- a. The reduced fire-flow shall be not less than 1,000 gallons per minute.
- b. The reduced fire-flow shall be not less than 1,500 gallons per minute.

B105.3 Water supply for buildings equipped with an automatic sprinkler system.

For buildings equipped with an approved *automatic sprinkler system*, the water supply shall be capable of providing the greater of:

1. The *automatic sprinkler system* demand, including hose stream allowance.
2. The required fire-flow.

## SECTION B106 - REFERENCED STANDARDS

<a href="#">ICC IBC—15</a>	<a href="#">International Building Code</a>	<a href="#">B104.2</a>
<a href="#">ICC IFC—15</a>	<a href="#">International Fire Code</a>	<a href="#">Tables B105.1(1)</a> and <a href="#">B105.2</a>
<a href="#">ICC IWUIC—15</a>	<a href="#">International Wildland-Urban Interface Code</a>	<a href="#">B103.3</a>
<a href="#">ICC IRC—15</a>	<a href="#">International Residential Code</a>	<a href="#">Table B105.1(1)</a>
<a href="#">NFPA 1142—12</a>	<a href="#">Standard on Water Supplies for Suburban and Rural Fire Fighting</a>	<a href="#">B103.3</a>