

## Site and Building Planning Guide for Commercial Occupancies based upon the 2009 International Fire Code as Adopted and Amended by Resolution by the Arvada Fire Protection District

This site and building planning guide for commercial occupancies is based upon the 2009 International Fire Code, as amended and adopted by Resolution by the Board of Directors of the Arvada Fire Protection District. This site and building planning guide for commercial occupancies is based upon the 2009 International Fire Code and the 2009 International Building Code. Commercial occupancies include for site planning all buildings other than one and two family dwellings and town homes as classified by the International Residential Code as Group R, Division 3 Occupancies. This guide is prepared for use within the areas of the Unincorporated Areas of Jefferson County that are within the boundaries of the Arvada Fire Protection District. This information is intended to be used as a guide for site and building planning purposes. This guide is not designed or intended to be inclusive of all code requirements. Additional requirements based upon the 2009 edition of the International Fire Code as amended, may be addressed upon the submittal and review of site and building plans by the Life Safety Division.

### Building Address Numbers:

New buildings shall have approved address numbers, building numbers or approved building identification placed upon the building in a position that is plainly legible and visual from the street or roadway fronting the property. The address numbers shall contrast in their background. Address numbers shall be Arabic numerals or alphabet letters. Address or building identification numbers shall be a minimum height of not less than four (4) inches, and with a minimum stroke width of not less than 0.5 inches.

IFC 09 505.1.

When address numbers are placed on buildings that are provided from alleys or private streets from the main street frontage, address signs and or address numbers shall be posted at the entrance to the alley or private street. The address signs shall be approved by the Life Safety Division prior to installation.

IFC 09 505.1.

## Fire Apparatus Access Roads:

Approved fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into the Arvada Fire Protection District. The fire apparatus access road shall comply with the requirements of the fire code and shall extend to within one-hundred-fifty (150) feet of all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building or facility.

IFC 09 503.1.1.

Exception: The fire marshal is authorized to increase the dimension of one-hundred-fifty (150) feet where:

1. The building is provided throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1., 903.3.12. or 903.3.1.3 of Section 903 Automatic Sprinkler Systems.
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.

## Installation of Fire Apparatus Access Roads:

Fire apparatus access roads shall be installed and approved by the Life Safety Division prior to above grade construction.

IFC 09 503.2.3. Amended.

## Commercial and Industrial Developments:

Buildings exceeding three stories or 30 feet in height. Buildings or facilities exceeding thirty (30) feet in height or three (3) stories in height shall have at least two (2) means of fire apparatus access for each structure.

IFC 09 D104.1.

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

IFC 09 D104.2.

Exception: Projects having a gross building area up to one-hundred-twenty-four thousand (124,000) square feet that have a single approved fire apparatus access road when all buildings are equipped throughout with approved automatic sprinkler systems.

Remoteness: Where two (2) fire access roads are required, they shall be placed a distance apart equal to not less than one-half (1/2) of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

FC 09 D104.3.

### Aerial Fire Apparatus Access Roads:

Where Required. Buildings or portions of buildings or facilities exceeding thirty (30) feet in height above the lowest 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.

IFC 09 D105.1.

Width: Aerial apparatus access roads shall have a minimum unobstructed width of twenty-six (26) feet, exclusive of shoulders, in the immediate vicinity of any building or portion of building more than thirty (30) feet in height.

IFC 09 D105.2.

Proximity to Building: At least one of the required access routes meeting this condition shall be located within a minimum of fifteen (15) feet and a maximum of thirty (30) feet from the building, and shall be positioned parallel to one entire side of the building.

IFC 09 D105.3.

### Multi-Family Residential Developments:

Projects having more than one-hundred (100) dwelling units. Multi-family residential projects having more than 100 dwelling units shall be equipped throughout with two (2) separate and approved fire apparatus access roads.

Exception: Projects having up to two-hundred (200) dwelling units may have a single approved fire apparatus access road when all buildings, including non residential occupancies, are equipped throughout with an approved automatic sprinkler systems installed in accordance with Section 903.3.1.1 or 903.1.2. of the Fire Code.

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

#### Additional Access:

The fire marshal or designated representative is authorized to require more than one fire apparatus access road based upon the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

IFC 09 503.1.2.

#### Fire Apparatus Access Road Widths:

Fire apparatus access roads or fire access lanes shall have a minimum unobstructed width of twenty-four (24) feet.

IFC 09 503.2.1. Amended.

#### Vertical Clearance:

An unobstructed vertical clearance of not less than thirteen (13) feet, six (6) inches shall be provided and maintained.

IFC 09 503.2.1.

#### Authority:

The fire marshal shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations.

IFC 09 509.2.2.

#### Surface:

Fire apparatus access roads shall be designed and maintained to support the imposed loads of eighty-five thousand (85,000) pound fire apparatus and shall be surfaced with the first lift of asphalt to provide all-weather driving capabilities prior to above grade construction.

Exception:

When concrete is to be installed for fire apparatus access roadways, compacted road base may be used in place of the first lift of asphalt for a period of ninety (90) days. The fire apparatus access road base shall be designed to support the imposed loads of eighty-five (85) thousand lb. fire apparatus. The compacted road base for fire apparatus access roadways shall be maintained to provide all-weather driving capabilities and shall be immediately repaired as needed.

IFC 09 503.2.3. Amended.

Grass-crete, Ritter-Rings or similar landscape treatments that will prevent a fire apparatus access road from being maintainable as an all-weather surface and immediately discernable, shall be prohibited.

Turning Radius:

The required turning radius for fire apparatus shall be a minimum outside radius of forty-seven (47) feet, four (4) inches. The inside radius shall be a minimum of twenty-six (26) feet four (4) inches with a eight (8) foot bumper overhang. PDF of turning radius templates is available on our web site [www.arvadafire.com](http://www.arvadafire.com).

IFC 09 503.2.4.

Dead End Fire Apparatus Access Roads:

Dead end fire apparatus access roads in excess of one-hundred-fifty (150) feet in length shall be provided with an approved area for the turning around of fire apparatus.

IFC 09 503.2.5.

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 AASHITO HB-17 and Jefferson County Engineering Standards. Bridges and surfaces shall be designed for a live load of a minimum of eighty-five thousand (85,000) pound fire apparatus. Vehicle load limits shall be posted at both entrances to bridges. Where elevated surfaces which are not designed as for use of fire apparatus, approved barriers or signs shall be installed and maintained.

IFC 09 503.2.6.

#### Fire Apparatus Access Road Grades:

The grade of fire apparatus access roads shall not exceed Jefferson County Engineering Standards and Arvada Fire Protection District Standards.

IFC 09 503.2.7.

#### 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 marshal based upon the fire department's apparatus.

IFC 09 503.2.8.

#### Marking of Fire Apparatus Access Roads:

"No Parking Fire Lane" signs shall be installed on each side of fire apparatus access roads, private streets or alleys to identify such roads and to prohibit parking. The maximum spacing between signs shall not exceed one-hundred-thirty-five (135) feet.

"No Parking Fire Lane" signs shall meet the requirements set forth within the Jefferson County Standards.

IFC 09 503.3.

#### Mountable Curbs:

Vertical curbs shall not be placed at the entrance of or within fire access lanes or roads. Mountable curbs and gutter may be used, if approved by the fire marshal.

IFC 09 503.2.9. Amended.

#### Water Supplies and Fire Hydrants for Fire Protection:

Water lines and fire hydrants shall be installed, operational and capable of providing the minimum required fire flow for the building(s) or sites prior to above grade construction.

IFC 09 507.1.

Water lines shall be installed and looped in accordance with the Water District of jurisdiction standards.

### Fire Flow Calculation Area:

The fire flow calculation area shall be the total floor area of all floors within the exterior walls, and under the horizontal projections of the roof of a building except as modified in Section B 104.3.

IFC 09 Appendix B. Section B 104.1.

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

IFC 09 Appendix B. Section B 104.3.

### Minimum Required Fire Flow:

The minimum required fire flow for buildings is calculated from Appendix B, Table B 105.1.

IFC 09 Appendix B.

A copy of Appendix B, Table B is available upon request from the Life Safety Division.

### Reductions in the Minimum Required Fire Flow Area Separations:

Portions of buildings which are separated by two (2) hour fire walls without openings, constructed in accordance with the 2009 International Building Code are allowed to be considered as separate fire flow calculations.

IFC 09 Appendix B. Section B 104.2.

A reduction in the required fire flow up to seventy-five (75) percent as approved by the

fire marshal is allowed when the building is provided with an approved automatic sprinkler system installed in accordance with Section 903.1.1., 903.1.2 Fire Protection Systems of the fire code. The resulting available fire flow shall not be less than one-thousand-five-hundred (1,500) gallons per minute for the prescribed duration as specified in Appendix B Table B 105.1  
IFC 09 Appendix B Section B 105.2.

### Fire Flow Test Information:

Fire flow test information may be obtained from the Water District of jurisdiction.  
IFC 09 507.4.

### Fire Hydrant Spacing:

Fire hydrant spacing in commercial and multi-family occupancies shall be installed at a maximum of three-hundred (300) feet spacing between units.  
IFC 09 507.5.1. Exception 3 Amended.

Fire hydrant locations shall be approved by the Water District of jurisdiction and the Life Safety Division.  
IFC 09 507.5.1.

### Sprinkler or Standpipe Systems and Fire Hydrant Location:

A fire hydrant shall be installed and maintained within one-hundred-fifty (150) feet of a fire department connection serving a sprinkler or standpipe system.  
IFC 09 903.7.1 Amended.

### Installation of Fire Hydrants:

Fire hydrants shall be installed in such a manor that the four and one-half (4-1/2) inch discharge nozzle on the fire hydrant is a minimum of eighteen (18) inches above finished grade in accordance with Water District of jurisdiction standards.

### Fire Hydrant Hose Thread Connections:

Fire hydrant discharge nozzle threads shall be National Standard Threads or in

accordance with the Water District of jurisdiction.

### Fire Hydrant Obstructions:

Posts, fences, vehicles, growth, trash storage, mail kiosks, transformers or other materials or objects shall not be placed or kept near fire hydrants that would prevent such equipment from being immediately discernable.

IFC 09 507.5.4.

### Fire Hydrants Subject To Vehicle Damage:

Fire hydrants that are subject to vehicular impact shall be protected by posts that comply with the fire code or by other approved physical barriers that comply with the fire code.

IFC 09 312.1.

1. Constructed of steel not less than four (4) inches in diameter and concrete filled.
2. Spaced not more than four (4) feet between posts on center.
3. Set not less than three (3) feet deep in concrete footing of not less than a fifteen (15) inch diameter.
4. Set with the top of the posts not less than three (3) feet above the ground.
5. Located not less than three (3) feet from the protected object.

Other barriers: Physical barriers shall be a minimum of thirty-six inches in height and shall resist a force of twelve (12,000) pounds applied thirty-six (36) inches above the adjacent ground surface.

IFC 09 312.3.

### Clear Space Around Fire Hydrants:

A minimum of a three (3) foot clear space shall be provided and maintained around the circumference of fire hydrants.

IFC 09 507.5.5.

### Fire Protection Systems:

For information on sprinkler or standpipe systems that may be required by the

International Fire and Building Codes or required for access, fire flow requirements for water supply, please contact the Life Safety Division or the Jefferson County Department of Building Safety.

### Underground Lines for Fire Protection Systems:

Underground fire lines and water lines shall be adequately sized for the sprinkler system design density and required inside and outside hose streams.

Underground contractors shall be licensed with the Colorado Division of Fire Safety and the Water District of jurisdiction.

Underground fire line design and installation will need to be approved, inspected and hydro-tested by the Water District of jurisdiction.

### Back Flow Prevention:

Back flow prevention shall be installed on all new sprinkler and standpipe systems. IFC 09 912.5.

Double Check back flow prevention devices may be installed for sprinkler and standpipe systems without chemicals.

Reduced Pressure back flow prevention shall be installed on sprinkler and standpipe systems using anti-freeze or chemicals.

Please contact the Water District of jurisdiction for installation and type of back flow prevention that is approved for installation.

IFC 09 912.5.

### Fire Sprinkler or Standpipe Control Rooms:

When an automatic fire sprinkler system or standpipe system is provided within a building and serves more than one tenant space, the main control valves shall be located within a room of sufficient size that has access provided from the building exterior with a door that is provided for fire department access. Said door shall not be less than three (3) feet in width, by six (6) feet eight (8) inches in height and shall be

appropriately labeled with a permanent sign having letters of not less than one (1) inch in height stating, "Fire Control Room".

IFC 09 903.1.2. Amended for Sprinkler Systems. IFC 09 905.1.2. Amended for Standpipe Systems.

### Fire Department Connection Locations for Sprinkler and Standpipe Systems:

The fire department connection serving a sprinkler or standpipe system shall be located on the front of the building as approved by the fire marshal.

IFC 09 903.3.7.

### Fire Department Connection Height:

A fire department connection serving a sprinkler or standpipe system shall be installed at a minimum height of not less than three (3) feet nor more than four (4) feet above finished grade.

IFC 09 903.3.7.1. Amended Sprinkler System. IFC 09 905.1.1. Amended Standpipe System.

### Access to Fire Department Connections:

Immediate access to fire department connections shall be provided and maintained at all times and without obstruction by fences, bushes, trees, walls, or any other object for a minimum of three (3) feet.

IFC 09 912.3.

### Clear Space Around Fire Department Connections:

A working space of not less than thirty-six (36) inches in width, thirty-six (36) in depth, and seventy-eight (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 marshal.

IFC 09 912.3.2.

## Locking Fire Department Connection Caps:

Locking Knox fire department connection caps shall be provided on fire department connections for water-based fire-protection systems.

IFC 09 912.3.1.

Please contact the Life Safety Division for an application form.

The doors to the electrical room shall be labeled, “Main Electrical Disconnect” in a minimum of one (1) inch letters on a contrasting background.

IFC 09 605.3.1.2. Amended.

## Emergency Responder Radio Coverage:

All buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of public safety communications systems of the jurisdiction at the exterior of the building.

IFC 09 510.1.

Exceptions:

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

## Gas Meters Subject to Vehicular Damage:

Gas meters that are subject to vehicular damage shall be adequately protected by posts or other approved barriers that comply with the fire code.

IFC 09 312.1.

1. Constructed of steel not less than four (4) inches in diameter and filled with concrete.
2. Spaced not more than four (4) feet between posts on center.
3. Set not less than three (3) feet deep in a concrete footing of not less than a

fifteen (15) inch diameter.

4. Set with the top of the posts not less than three (3) feet above the ground.  
located not less than three (3) feet from the protected object.

Other barriers: Physical barriers shall be a minimum of thirty-six (36) inches in height and shall resist a force of twelve (12,000) pounds applied thirty-six (36) inches above the adjacent ground surface.

IFC 09 312.3.

### Key Boxes:

A Knox Box key box shall be provided on all buildings that have required sprinkler systems, extinguishing systems, standpipe systems or fire alarm systems.

IFC 09 506.3. Amended.

Please contact the Life Safety Division for an application form.

The key box shall contain all necessary keys to gain access to the building and fire control rooms and shall be maintained at all times.

IFC 09 506.2