



# SITE PLANNING GUIDE

## FOR COMMERCIAL OCCUPANCIES

Division of Fire Prevention



**WHEAT RIDGE FIRE PROTECTION DISTRICT**

*DOING THE RIGHT THINGS AT THE RIGHT TIMES FOR THE RIGHT REASONS*

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## ***General Information***

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This site planning guide for commercial occupancies is based upon the 2006 International Fire Code and the 2006 International Building Code as amended and adopted by the City of Wheat Ridge and the Wheat Ridge Fire Protection District. For site plan purposes, commercial occupancies include all buildings other than one and two family dwellings and townhomes as classified by the International Residential Code. This guide has been prepared for use within the City of Wheat Ridge and within the boundaries of the Wheat Ridge Fire Protection District. This information is intended to be used as a guide for site planning purposes and is not intended to be inclusive of all code requirements. Additional requirements based upon the International Fire Code as amended may be applicable once a site plan submittal has been reviewed by the Division of Fire Prevention.

## ***Signage***

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Streets and roads shall be identified with approved signs. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles. Signs shall be of an approved size, weather resistant and be maintained until replaced by permanent signs. Street signs, temporary or permanent, shall be installed prior to above grade construction. (IFC 06 505.2)

**Private Street Signs.** Street signs for private streets are not provided by the City of Wheat Ridge. The installation of street signs shall be the responsibility of the developer. Street signs shall meet the requirements of the Model Traffic code. The street sign design shall be approved by the Division of Fire Prevention prior to installation. (IFC 06 505.2)

**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 with 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 06 505.1)

When address numbers are placed on buildings that are accessed from alleys or private streets away 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 Division of Fire Prevention prior to installation. (IFC 06 505.1)

## ***Fire Apparatus Access Roads***

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Approved fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into the Wheat Ridge 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 06 503.1.1)

Exception: The fire marshal or designated representative 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 the fire code.
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.

**Additional Access.** The fire marshal 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 06 503.1.2)

**Commercial and Industrial Developments.** Buildings of facilities exceeding thirty (30) feet or three stories in height shall have at least three means of fire apparatus access for each structure. (IFC 06 D104.1)

Buildings or facilities having a gross building area of more than sixty-two (62) thousand square feet shall be provided with two separate and approved access roads. (IFC 06 D104.1)

Exceptions:

1. Projects having a gross building area of up to 124,000 one-hundred-twenty-four thousand square feet that have a single approved fire apparatus access road when all buildings are equipped throughout with an approved automatic sprinkler system.
2. Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses. (IFC 06 D104.3)

**Aerial Fire Apparatus Access Roads.** 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 apparatus access roadway. (IFC 06 Appendix D105.1)

Fire apparatus access roads shall have a minimum unobstructed width of twenty- six (26) feet in the immediate vicinity of any building or portion of building more than thirty (30) feet in height. (IFC 06 Appendix D105.2)

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 on one entire side of the building. (IFC 06 D105.3)

**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 06 503.2.1 Amended)

**Vertical Clearance.** An unobstructed vertical clearance of not less than thirteen (13) feet, six (6) inches shall be provided and maintained. (IFC 06 503.2.1)

**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 06 503.2.2)

**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, and shall be installed prior to above grade construction. (IFC 06 503.2.3 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. (IFC 06 503.2.3 Amended)

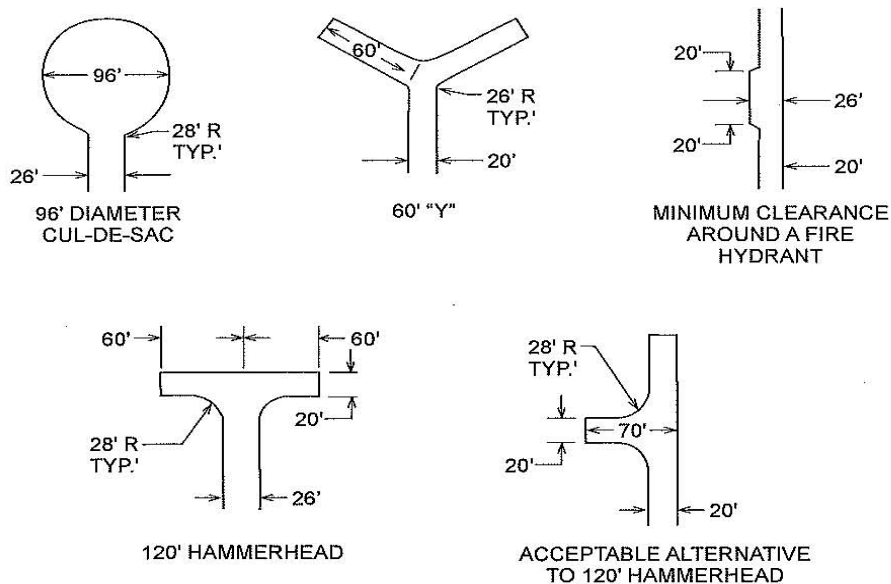
**Bridges and Elevated Surfaces.** Where a bridge or elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with AASHITO HB-17 and City of Wheat Ridge Engineering Standards. Bridges and surfaces shall be designed for a live load of a minimum 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 06 503.2.6)

**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 06 503.2.5)

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

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

**Turning Radius.** The required turning radius for fire apparatus shall be a minimum of forty-seven feet-four inches (47) feet four (4) inches outside radius and twenty six (26) feet six (6) inches inside radius with a four (4) foot bumper overhang. (IFC 06 503.2.4)



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

**Fire Apparatus Access Road Grades.** The grade of fire apparatus access roads shall not exceed City of Wheat Ridge Engineering and Wheat Ridge Fire Protection District Standards. (IFC 06 503.2.7)

**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 06 503.2.8 Amended)

**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 135 feet. “No Parking Fire Lane” signs shall meet the requirements as set forth by the City of Wheat Ridge. (IFC 06 503.3)

## ***Water Supply and Fire Flow***

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Water lines and fire hydrants shall be installed, operational and capable of providing the minimum required fire flow for the building sites prior to above grade construction. (IFC 06 508.5.1)

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 06 Sec B104.1)

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 06 SecB104.3)

**Minimum Required Fire Flow.** The minimum required fire flow for buildings is calculated from Appendix B, Table B 105.1. (IFC 06 Appendix B)

A copy of Appendix B, Table B is available upon request from the Division of Fire Prevention.

**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 2006 International Building Code are allowed to be considered as separate fire flow calculations. (IFC 06 Sec B104.2)

A reduction in the required fire flow up to fifty (50) 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. 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 06 Sec B105.2)

**Sprinkler Systems Not Permitted For Reduction In Minimum Fire Flows.** NFPA 13-R Sprinkler Systems are not permitted to be used for a reduction in the minimum required fire flow. (IFC 06 Sec B103.1 Amended)

**Fire Flow Test Information.** Fire flow test information may be obtained from the Division of Fire Prevention of the Wheat Ridge Fire Protection District. Fire flow tests are usually completed within ten (10) working days, unless conflicts or weather conditions arise in scheduling tests with the Water District of jurisdiction or the Division of Fire Prevention. (IFC 06 508.4)

## ***Fire Hydrant Spacing***

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Fire hydrant spacing in commercial and multi-family occupancies shall be installed at a maximum of three-hundred (300) feet spacing between units. (IFC 06 508.5.1 Exp. 3 Amended)

Fire hydrant locations shall be approved by the Water District of jurisdiction and the Division of Fire Prevention. (IFC 06 508.5.1)

**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 06 508.1 Amended)

## ***Fire Hydrants and Installation***

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Fire hydrants shall be painted colors as approved by the Water District of jurisdiction. (IFC 06 508.5.7 Amended)

Fire hydrants shall be installed in such a manner 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 the Water District of jurisdiction standards.

Fire hydrant discharge nozzle threads shall be in accordance with the Water District of jurisdiction standards.

**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 06 508.5.4)

**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 06 508.5.5)

**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 06 312.1)

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 06 312.3)

## ***Fire Protection Systems***

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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 Division of Fire Prevention or the City of Wheat Ridge Building Department.

Sprinkler System Requirements as Amended:

In addition to the required sprinkler system installations as specified within the International Fire Code, 2006 edition, the following occupancies shall be required to be provided with automatic sprinkler systems:

**Group B Occupancies.** An automatic sprinkler system shall be installed in Group B, Occupancies where the floor area exceeds twelve-thousand (12,000) square feet or eighteen-thousand (18,000) square feet on combined floors and mezzanines.  
(IFC 06 903.2.1.6 Amended)

**Group E Occupancies.** An automatic sprinkler system shall be installed in Group E Occupancies where the floor area exceeds twelve-thousand (12,000) square feet or eighteen-thousand (18,000) square feet on combined floors and mezzanines:  
(IFC 06 903.2.2 Amended)

**Group F-2 Occupancies.** An automatic sprinkler system shall be installed in Group F-2 Occupancies where the floor area exceeds twelve-thousand (12,000) square feet or eighteen-thousand (18,000) square feet on combined floors and mezzanines.  
(IFC 06 903.2.2.2 Amended)

**Group S-2 Occupancies.** An automatic sprinkler system shall be installed in Group S-2 Occupancies where the floor area exceeds twelve-thousand (12,000) square feet or eighteen-thousand (18,000) square feet on combined floors and mezzanines. (IFC 06 903.2.9.1.2 Amended)

**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 and inspected by the Water District of jurisdiction.

The two-hundred (200) pound hydrostatic two (2) hour test shall be witnessed by the Division of Fire Prevention. (IFC 06 508.5.3)

**Back Flow Prevention.** Back flow prevention shall be installed on all new sprinkler and standpipe systems. (IFC 06 903.3.5)

1. Double Check back flow prevention devices may be installed for sprinkler and standpipe systems without chemicals.
2. 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 06 912.5)

**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 06 903.1.2 and IFC 06 905.1.2 Amended)

**Fire Department Connection Locations.** 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 06 903.3.7)

**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 06 903.3.7 and IFC 06 905.5.1 Amended)

**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 06 912.3)

**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 06 912.3.1)

Contact the Division of Fire Prevention for Knox application form.

## ***Utilities***

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**Electrical rooms.** 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 06 605.3.1.2 Amended)

**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 06 312.1)

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 and located not less than three (3) feet from the protected object.
5. 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 06 312.3)

## ***Miscellaneous Features***

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**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. Please contact the Division of Fire Prevention for a Knox application form. (IFC 06 506.3 Amended)

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 06 506.2)

**Trash Enclosures.** Trash enclosures shall be of non-combustible construction including gates or doors. (IFC 06 304.2.1 Amended)