

Construction & Development Procedures Guide



Updated January 2022

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WELCOME TO FRONT RANGE FIRE RESCUE

Front Range Fire Rescue (FRFR) is a fire protection district serving a 74-square mile service area that includes the towns of Johnstown and Milliken, as well as portions of Weld and Larimer counties. FRFR was formally established on January 1, 2018, as a fire protection district organized under Title 32 of Colorado Revised Statutes. Prior to that, the agency existed since 2015 as a fire authority – an independent government entity formed through an intergovernmental agreement between the Milliken and Johnstown fire protection districts. The Milliken and Johnstown fire protection districts have been in existence since 1949 and 1952 respectively.

FRFR is an all-hazards emergency services agency, providing fire suppression; emergency medical services; basic and technical rescue; hazardous materials mitigation; fire prevention, inspection, and investigation; public education; and domestic preparedness, planning and response for approximately 22,000 residents. The district's core values of courage, compassion, and professionalism are applied by all of our members as we strive to provide the highest level of service possible to all citizens and guests of the communities we serve.

ABOUT THIS GUIDE

This Guide has been developed with the intent of clarifying the requirements of the International Fire Code as adopted in our communities. Our goal in the construction and development review process is to assist property owners, construction contractors, and design professionals as they design and build properties and buildings to meet minimum life safety standards. We strive to ensure that all buildings are safe for the building owners, visitors, customers, as well as for your firefighters. We do this through the consistent application of the adopted International Fire Code (IFC), national standards, county and municipal codes and standards, agency policies, and best management practices.

Within the FRFR jurisdiction, the 2018 International Fire Code is enforced.

Weld County Consent to Enforce approved on 06-12-2019

Town of Johnstown Implemented on 02-01-2020

Town of Milliken Implemented on 08-01-2020

All public schools and healthcare facilities are governed by the 2021 International Fire Code and other national standards, as adopted by the Colorado Division of Fire Prevention and Control.

At the time this Guide was prepared, FRFR did not have any property within unincorporated Larimer County. Should property within Larimer County be found to exist within FRFR jurisdiction, the district will enforce the 2018 IFC pursuant to the 2018 International Building Code adopted by Larimer County:

Section 101.4.5 Fire prevention. The provisions of the International Fire Code shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, alteration or removal of fire suppression, automatic sprinkler systems and alarm systems or fire hazards in the structure or on the premises from occupancy or operation

Free access to the International Fire Code can be found at the following website:

<https://codes.iccsafe.org/content/IFC2018>

The specific amendments adopted and enforced within each local municipality can be found on the FRFR website or in the Appendices of this document.

- Unincorporated Weld County amendments
- Town of Johnstown amendments
- Town of Milliken amendments

In addition to the International Fire Code, several standards published by the National Fire Protection Association (NFPA) are also enforced within the FRFR jurisdiction. Information on all NFPA standards can be found at the following website:

www.nfpa.org/Codes-and-Standards/All-Codes-and-Standards/Free-access

GETTING STARTED: PLANNING APPROVAL AND BUILDING PERMIT PROCESSES

The first step in any new development or building is to receive approval from the local government (e.g., town or county). For most proposed new residential and commercial developments, new buildings, or building additions, start your project by contacting the appropriate municipal (town or county) planning and zoning department using the phone numbers listed below. This usually requires that the developer must submit a wide variety of required planning documents, plans, plats and other proposed public improvement construction documents. These are reviewed by the municipal government for compliance with their planning and zoning rules before they are sent out for referral comments from all other interested parties, including the fire district. Construction may not begin on any project until all referral agencies have provided input and all required permits have been issued.

Town of Johnstown (www.townofjohnstown.com)

Planning and Building Departments	970-587-4466
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Town of Milliken (www.millikenco.gov)

Community Development	970-587-4331
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Weld County (www.weldgov.com)

Planning and Building Department	970-400-6100
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Larimer County (www.larimer.org)

Planning Department	970-498-7679
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Building Department	970-498-7700
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It is also important to remember that additional municipal government requirements may apply to any given project or proposal, including but not limited to business license, liquor license, sign permit, and access permit. Please be sure to give complete and accurate information to the planning or building department staff so that nothing is missed during your application process.

Once the municipal government has given initial approval for the project to move forward, then the applicant must provide all of the same documents to Front Range Fire Rescue for review. All documents shall be provided electronically for review by sending them to:

Plans@FRFR.co

If you are unable to submit electronic documents, please send us an email to let us know what is going on and we will work with you to review printed documents. If you must submit printed documents, you must submit two (2) complete sets of all documents.

If you have questions about your project, please feel free to reach out to us.

Front Range Fire Rescue Life Safety section: 970-587-4464 or Plans@FRFR.co

www.fronrangefirerescue.co/resources/construction-services/

Refer to our website for a complete description of all required document submittals, review processes, fee schedules, and many more related topics.

WHAT PLANS ARE REVIEWED BY FRFR?

Front Range Fire Rescue reviews all planning documents and building permit submittals for projects within its jurisdiction to ensure compliance with the adopted International Fire Code. Fire code requires that FRFR performs plan review for the purpose of confirming, applying, and enforcing fire code requirements from the Preliminary Development Plan (PDP) stage, all the way through to Final Plat, for all types of proposed developments and construction projects, including but not limited to:

- | | |
|-----------------------------------|---|
| a. Planned Unit Development (PUD) | f. Commercial business development |
| b. Commercial subdivisions | g. Industrial parks and oil & gas exploration |
| c. Residential subdivisions | h. Minor residential developments |
| d. Mixed-Use subdivision | i. Multi-family developments |
| e. Special improvement districts | j. Use by Special Review |

In addition to development reviews, FRFR also reviews building construction documents, plans, etc. and issues building construction permits for any construction project being completed in all of the following proposed occupancies and/or buildings:

Assembly occupancies (A1 through A5)	Institutional occupancies (I1 through I4)
Business occupancies (B)	Mercantile occupancies (M)
Educational occupancies (E)	Residential occupancies (R1 through R4)
Factory/Industrial occupancies (F1 and F2)	Storage occupancies (S1 and S2)
High Hazard occupancies (H1 through H5)	Miscellaneous occupancies (U)

Any application for proposed building construction must be complete and include all of the same attachments that are routinely provided to the Building Code Official for review.

FRFR also performs plan review for the purpose of applying fire code requirements and issuing permits to the following types of mechanical, electrical, and hydraulic systems:

- a. Fire alarm systems
- b. Fire sprinkler systems
- c. Kitchen hood and duct extinguishing systems
- d. In-building radio amplification systems
- e. Spray paint/finish booths
- f. Clean-agent suppression systems
- g. Fire pumps
- h. Hazard control systems
- i. Hazardous materials storage/use/dispensing systems
- j. High-piled storage systems

FRFR also performs plan review, applies fire code requirements and issues permits for tents/canopies, fireworks sales stands, indoor and outdoor fireworks displays, hazardous materials processes, hazardous materials storage, special events, mobile food vendors, and a wide variety of other areas, as addressed in the International Fire Code.

PLAN REVIEW PROCESS

Under normal circumstances, we typically complete all review of submitted plans within 15 business days, provided all necessary plans and other information is submitted. Additional time may be necessary based upon the complexity of the projects and/or the completeness of submitted information. If plan review is anticipated to exceed 15 business days, the Fire Code Official will notify the applicant of the delay and the reasons for the delay.

Before beginning any new construction or remodel construction project, the general contractor should work with a licensed design professional to determine if fire alarms and/or fire sprinkler systems will be required for the project. If any fire protection system is required, a valid FRFR permit is required to begin construction.

Please submit all documents and other information electronically to Plans@FRFR.co. If only printed plans are available, please contact the Life Safety section to inquire about requirements for plan submittal.

If a fire protection system contractor is proposing to make modifications to an existing fire protection system that will affect 10 or fewer devices, the permit submittal may include the FRFR Plan Review/Permit Application form and a "Letter of Scope" that specifically describes the modifications to be performed. Based on the amount of work to be completed, it may be possible to decrease the amount of supporting documentation to be submitted.

Front Range Fire Rescue reviews information that is submitted for all proposed residential, commercial and/or mixed-use developments to ensure compliance with requirements of the International Fire Code and associated standards.

Approved fire apparatus access roads shall be required for every facility, building, and/or portion of a building hereafter constructed or moved into or within the jurisdiction. Fire apparatus access roadway grades shall not exceed 10 percent, and all intersections and turnarounds shall be level, with the exception of crowning for water run-off. Traffic calming devices shall be prohibited unless approved by the Fire Code Official. This includes but is not limited to speed bumps, speed humps, speed cushions, traffic circles, and neckdowns.

Number of Fire Apparatus Access Roads Required

Developments that include 30 or more one- or two-family dwellings, including townhomes, shall be provided with two separate and approved fire apparatus access roads. Exceptions to this requirement include developments where all dwelling units are equipped throughout with an approved automatic fire sprinkler system or when the development plan includes a future second point of access, as specifically approved by the Fire Code Official.

Multiple-family residential projects having more than 100 dwelling units shall be provided with at least two separate and approved fire apparatus access roads. One exception to this requirement may be made for projects having not more than 200 dwelling units. This exception may allow the project to have a single approved fire apparatus access road when all buildings, including non-residential buildings, are equipped throughout with approved automatic fire sprinkler systems.

All new commercial buildings shall be provided with at least two separate and approved fire apparatus 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 lot or area to be served, measured in a straight line between accesses.

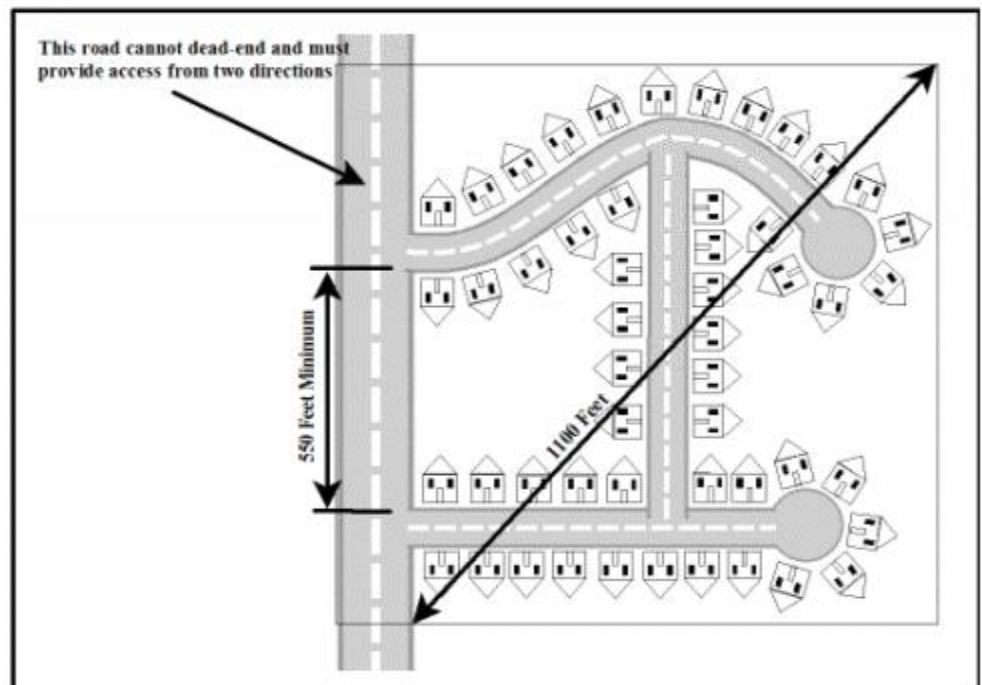


Figure 1: Separation of Multiple Access Roadways

Surface and Load Capacities

Fire apparatus access roads shall be of an all-weather surface (concrete, asphalt or other approved driving surface) that is easily distinguishable from the surrounding area and is capable of supporting not less than 80,000 pounds live load (gross vehicle weight). FRFR may require documentation from a registered engineer that the finished construction is in accordance with the approved plans or the requirements of the International Fire Code.

Turning Radius

The minimum turning radius for all turns within a property or subdivision shall be 25 feet inside, 50 feet outside or must meet the B40 turning template.

Fire Apparatus Design Specifications

The fire apparatus that are operated by Front Range Fire Rescue have the following specifications:

FIRE ENGINES		AERIAL LADDER	
Inside Cramp Angle	40 degrees	Inside Cramp Angle	45 degrees
Axle Track	83 inches	Axle Track	86 inches
Wheel Offset	5.3 inches	Wheel Offset	4.7 inches
Tread Width	13.5 inches	Loaded Tire Width	17.7 inches
Chassis Overhang	78 inches	Chassis Overhang	78 inches
Additional Bumper Depth	22 inches	Additional Bumper Depth	19 inches
Front Overhang	78 inches	Front Overhang	97 inches
Wheelbase	231.5 inches	Wheelbase	251.5 inches
Inside Turn	21 feet 0 inches	Inside Turn	19 feet 10 inches
Curb to Curb Turn	36 feet 7 inches	Curb to Curb Turn	36 feet 2 inches
Wall to Wall Turn	40 feet 3 inches	Wall to Wall Turn	41 feet 3 inches

Cul-de-Sac Requirements

If two fire apparatus access roads cannot be installed and a dead-end road exceeds 660 feet in length, all buildings beyond 660 feet from the entrance to the dead-end road, as measured from the roadway centerline, are required to be protected by an approved automatic fire sprinkler system.

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
501 - 750	26	120-foot hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac
Over 750		Special approval required

Table 1: Required Apparatus Turnarounds

Dead-End Roads

Dead-end roadways in excess of 150 feet in length shall be provided with an approved turnaround.

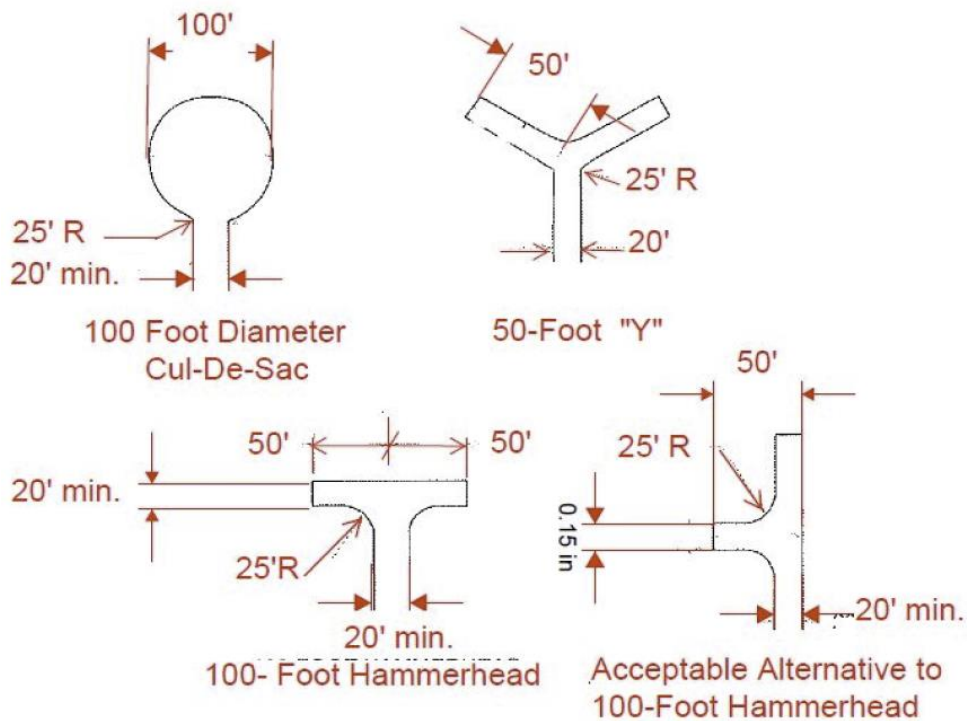


Figure 2: Turnarounds on Dead-End Access Roadways

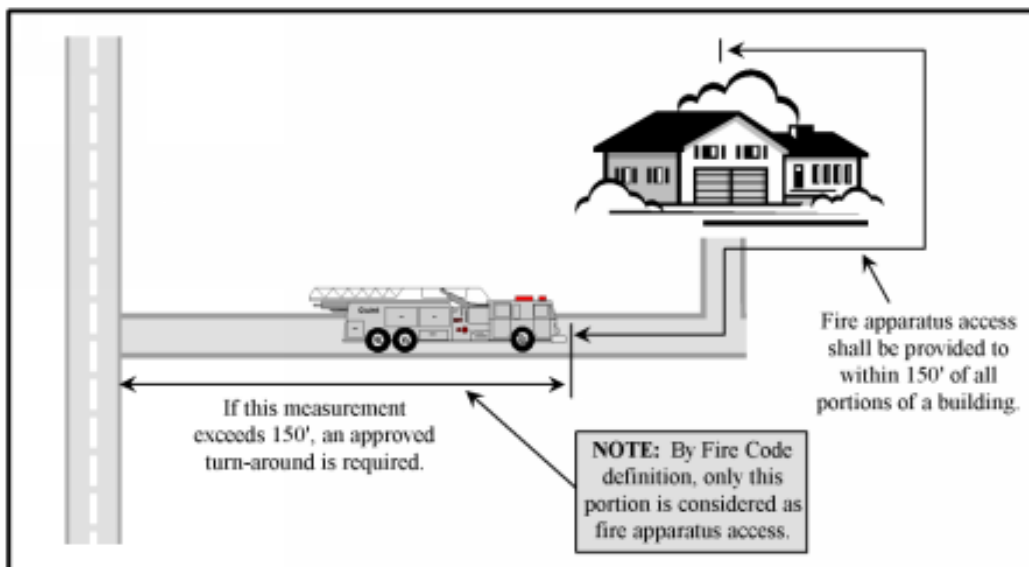


Figure 3: Dead-End Fire Apparatus Road

Overhead Clearance

All fire apparatus access roads, including aerial fire apparatus access roads, shall have a minimum overhead clearance of 13 feet 6 inches.

Fire Apparatus Access Road Width

Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet, exclusive of shoulders, and an unobstructed vertical clearance of not less than 13 feet 6 inches. This includes public streets, private streets, private drives and parking lot drive aisles. An Emergency Access Easement may be required to be dedicated on non-public roadways.

- Roads 20 to 26 feet wide shall be posted on both sides as a fire lane. Parking is prohibited on both sides of these streets.
- Roads 26 to 32 feet wide shall be posted on one side as a fire lane. Parking may be permitted on only one side of these streets.

Where a roadway is serving two or fewer dwelling units and/or accessory buildings, the drivable surface may be reduced to 12 feet if the roadway curves and turns can be navigated by a fire apparatus; however, the roadway shall still have an unobstructed width of not less than 20 feet.

Aerial Fire Apparatus Access Roads

For any building with a vertical distance between the grade plane and the highest roof surface exceeds 30 feet, approval aerial fire apparatus access roads shall be provided for the building. The highest roof surface is measured to the bottom of the eave of a pitched roof, or the intersection of a flat roof to the exterior wall, or the top of parapet walls, whichever is greater. Aerial fire apparatus access roads shall have a minimum unobstructed driving surface width of 26 feet in the immediate vicinity of the building. This includes public streets, private streets, private drives and parking lot drive aisles. An Emergency Access Easement may be required to be dedicated on non-public roadways.

At least one of the required aerial fire apparatus access routes shall be located between 15 and 30 feet from the building, and shall be positioned parallel to at least one entire long side of the building that has openings suitable for firefighter entry into the building. Examples of openings are windows, balconies, smoke tower landings, etc. The side(s) of the building with aerial access shall be approved by the Fire Code Official.

Fire Apparatus Access Road Distance from Buildings

An approved fire apparatus access road shall be within 150 feet of all portions of the first story exterior wall of any building, as measured by an approved route around the exterior of the building.

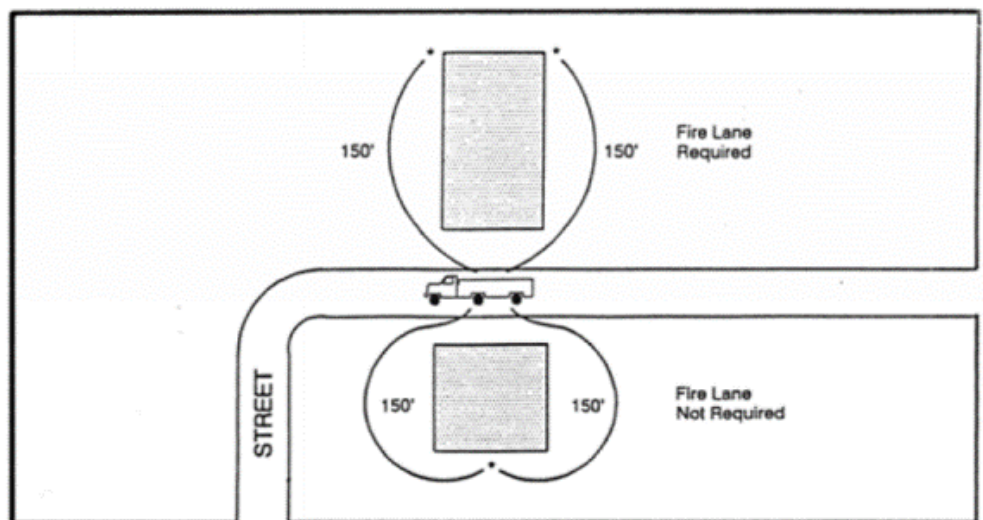


Figure 4: Fire Apparatus Access Road Distance from Buildings

Fire Lane – No Parking Signs and/or Painted Curbs

Where required by the Fire Code Official, fire apparatus access roadway curbs shall be painted red at approved locations and/or approved “Fire Lane – No Parking” signs shall be installed. Paint and signs shall be installed and maintained by the property owner. Signs shall be installed with a clear space above grade level of seven (7) feet and shall be installed 45-degrees from the traffic flow line.

Gates

Gates that are installed to secure fire apparatus access roads shall comply with all of the following:

- Minimum unobstructed width of 20 feet
- Gates serving one- or two-family dwellings shall be a minimum of 12 feet in width
- Gates shall be set back a minimum of 30 feet from the intersecting roadway
- Gates shall be of the swinging or sliding type
- Manual operation shall be capable by one person
- Electric gate operators, when required, shall be listed in accordance with UL 325.
- Gate components shall be maintained in an operative condition at all times, or replaced or repaired when defective.
- Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.
- Electric gates shall be equipped with a means for operation by fire department personnel (sire activation or Knox key switch). Private key pad is not acceptable.
- Manual opening gates may require a Knox padlock or Knox Box to ensure fire department access.

Bridges and Elevated Surfaces

Where a bridge or an elevated surface is part of a fire apparatus road, whether public or private, the bridge shall be constructed and maintained in accordance with the State of Colorado Department of Transportation and the American Association of State Highway and Transportation Officials *Standard Specification for Highway Bridges*. Bridges and elevated structures 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. The design engineer may be required to provide written final approval of the bridge to FRFR after construction is completed. Maintenance of the bridge shall be the responsibility of the party(ies) that use the bridge for access to their property(ies). FRFR may at any time, for due cause, ask that a registered engineer inspect the bridge for structural stability and soundness at the expense of the property owner(s) the bridge serves.

WATER DISTRICTS

The Front Range Fire Rescue response area is served by four water districts. Each water district may have unique requirements for its service area. For additional information, please contact the water district that serves your project.

Town of Johnstown Water Department: 970-587-4664

www.townofjohnstown.com/93/utilities

Town of Milliken Public Works Department: 970-587-4331

www.millikenco.gov

City of Greeley Water Department: 970-350-9811

www.greeleygov.com/services/ws/home

Little Thompson Water District: 970-532-2096

www.ltwd.org

Central Weld County Water District: 970-352-1284

www.cwcwd.com

FIREFIGHTING WATER SUPPLIES

Front Range Fire Rescue reviews all submitted plans for compliance with water supply requirements of the adopted fire code. This and the following section can be used to highlight requirements for water supply, as well as fire flow and fire hydrant requirements.

Access and Firefighting Water Supply During Construction

Approved fire apparatus access roadways and firefighting water supplies shall be installed and operational prior to any combustible construction or storage of combustible materials on the site.

Commercial and Multi-Family Building Fire Flow

The minimum fire flow and flow duration for buildings other than one- and two-family dwellings shall be determined in accordance with Appendix B and Table B105.1, as displayed on the following page. The required fire flow for a building shall not exceed the available GPM in the water delivery system at 20 psi.

Exception: A reduction in required fire flow of up to 75 percent, as approved, is allowed when the building is equipped with an approved automatic fire sprinkler system installed in accordance with IFC 903.3.1.1 or 903.3.1.2. The resulting fire flow shall not be less than 1,500 gpm for the prescribed duration as specified in Table B105.1.

One- and Two-Family Dwelling Fire Flow

The minimum available fire flow for single-family dwellings and duplexes served by a municipal water supply shall be 1,500 gallons per minute. If the structure is 3,600 square feet or larger, the required fire flow shall be determined according to Table B105.1, as displayed on the following page.

Exception: A reduction in the required fire flow of up to 50 percent, as approved, is allowed when the building is equipped with an approved automatic fire sprinkler system.

Required Fire Flow for Rural Buildings

Required fire flows for buildings constructed in rural areas in which adequate and reliable water supply systems do not exist shall be calculated in accordance with National Fire Protection Association (NFPA) Standard 1142: *Standard on Water Supplies for Suburban and Rural Water Supplies*. Please contact the Fire Marshal's Office for special assistance and other requirements that may apply.

NOTE: Within unincorporated Weld County, an approved and permitted residential fire sprinkler system is required in all newly constructed one- and two-family homes that have more than 3,600 square feet above grade.

Fire Department Connection (FDC)

For all sprinkler systems installed in commercial or multi-family buildings, the fire sprinkler system's fire department connection (FDC) shall be a 5-inch Storz connection with a 30-degree downward angle for NFPA 13 systems, or a single 2.5-inch connection for an NFPA 13R system. An approved fire hydrant shall be located within 150-feet of the fire department connection (FDC).

Fire hydrants and FDCs shall be located on the same side of the fire apparatus access roadway as the building being protected. The location of both the fire hydrant and the FDC shall be approved by the Fire Code Official.

A permanent sign shall be installed at the FDC that specifies fire sprinkler, sprinkler and standpipe, or standpipe. When an FDC serves multiple addresses and/or only portions of buildings (such as basement or standpipe), permanent signs shall be installed at the FDC identifying the location(s) served by the FDC.

Fire Hydrant Flow Testing

Flow tests are often required prior to the design of fire sprinkler systems, or to verify adequate municipal water supply is available for new developments. Oftentimes, the fire sprinkler system designer will schedule and complete the flow test in cooperation with the water provider. Front Range Fire Rescue does not perform hydrant flow tests, but does work with the water district that serves the property to ensure they are completed and documented appropriately. To schedule a flow test, please contact the water provider. Approved documentation of the final test results shall be provided to FRFR prior to final approval of the water supply system.

Fire Flow and Fire Hydrant Spacing

Where a portion of the facility or building hereafter constructed or moved into or within FRFR jurisdiction is more than 400 feet 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 were required by the fire code official.

Exceptions:

1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet.
2. For buildings equipped throughout with an approved automatic sprinkler system, the distance requirement shall be 600 feet.

Within the Towns of Johnstown and Milliken, the following fire code amendments have been adopted:

Fire hydrants shall be spaced 600 feet apart for Group R-3 occupancies and 350 feet apart for all other occupancies.

Exceptions:

1. Single family residential construction located within rural areas not within a city’s growth management area or within a city boundary shall be required to have hydrants located within 500 feet of any portion of the structure.
2. Single family residential construction protected with a fire sprinkler system located within rural areas not within a city’s growth management area or within a city boundary shall be required to have hydrants located within one (1) mile of any portion of the structure.
3. The fire code official is authorized to allow an alternate, approved means of water supply, such as in the NFPA 1142 standard.

Determining Required Fire Flow

Appendix B and C are used to determine required fire flow for all new buildings. Review Appendix B and apply the following tables based on the type of building(s) being constructed:

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 (sq ft)	Automatic Sprinkler System	Minimum Fire Flow (gallons per min)	Flow Duration (hours)
0 – 3,600	No sprinkler system	1,000	1
3,601 and greater	No sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at required rate
0 – 3,600	Sprinkler system per 2018 IFC 903.3.1.3 or 2018 IRC P2904	500	½
3,601 and greater	Sprinkler system per 2018 IFC 903.3.1.3 or 2018 IRC P2904	Half of value in Table B105.1(2)	1

NOTE: As you read each table, please be sure to read all footnotes as they apply to each building, to ensure the proper fire flow and duration are determined.

Table B105.1(2): Reference Table to establish fire flow and duration based on building construction type and size

**SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS**

B105.1 One- and two-family dwellings.

The minimum fire-flow and flow duration requirements for one- and two-family dwellings having a fire-flow calculation area that does not exceed 3,600 square feet (344.5 m²) shall be 1,000 gallons per minute (3785.4 L/min) for 1 hour. Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet (344.5m²) shall not be less than that specified in Table B105.1.

Exception: A reduction in required fire-flow of 50 percent, as approved, is allowed when the building is equipped with an approved automatic sprinkler system.

**TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS**

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute) ^b	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^a	Type IV and V-A ^a	Type IIB and IIIB ^a	Type V-B ^a		
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	3
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	
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 m², 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 residual pressure.

B105.2 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.

Exception: 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 or 903.3.1.2. The resulting fire-flow shall not be less than 1,500 gallons per minute (5678 L/min) for the prescribed duration as specified in Table B105.1.

Table B105.2: Required Fire Flow for buildings other than those in Table B105.1(1)

Automatic Sprinkler System (design standard used)	Minimum Fire Flow (gallons per min)	Flow Duration (hours)
No sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2)
2018 IFC 903.3.1.1	25% of the value in Table B105.1(2)*	Duration in Table B105.1(2) at the reduced flow rate
2018 IFC 903.3.1.2	25% of the value in Table B105.1(2)*	Duration in Table B105.1(2) at the reduced flow rate

* The reduced fire flow shall be not less than 1,500 gallons per minute

Once fire flow is determined, Appendix C is used to determine the required number of fire hydrants. The minimum number of fire hydrants for each building is determined based on Table C102.1:

Fire Flow Requirement (gpm)	Minimum Number of Hydrants
1,750 or less	1
1,751 to 2,250	2
2,251 to 2,750	3
2,751 to 3,250	3
3,251 to 4,000	4
4,001 to 5,000	5
5,001 to 5,500	6
5,501 to 6,000	6
6,001 to 7,000	7
7,001 or more	8 or more

Refer to the Fire Hydrant Number and Distribution section below to determine required spacing for fire hydrants. Be sure to also take into account that a fire hydrant must be located within 150 feet of any fire department connection (FDC) on a building that is equipped with one.

Fire Hydrant Number and Distribution

The minimum number and distribution of fire hydrants available to serve a building shall not be less than that listed in Table C105.1 below.

APPLICATION	SPACING BETWEEN HYDRANTS (feet) ^{a,b}	MAXIMUM DISTANCE FROM THE CLOSEST POINT ON A BUILDING TO A HYDRANT (feet)
Urban One - and Two-Family Dwellings, Group R-3 and R-4, and townhouses	600	600
Rural One - and Two-Family Dwellings, Group R-3 and R-4, and townhouses	1,000	1,000
All other buildings	350	400 ^c

Figure 5: Number and Distribution of Fire Hydrants

Footnotes a, b and c from the previous table are specific local amendments to the 2018 IFC:

- a. Where streets are provided with median dividers that cannot be crossed by firefighters pulling hose lines, or are arterial streets, hydrant spacing shall average 350 feet on each side of the street and be arranged on an alternating basis.
- b. 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.
- c. For buildings equipped with a fire department connection, see Section 507.5.1.1.

Undeveloped Areas

Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar problems, hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.

Considerations for Locating Fire Hydrants

Existing fire hydrants in areas are allowed to be counted towards the required number of hydrants for the proposed building or development, provided the existing hydrants receive a flow test that demonstrates they provide sufficient flows and pressures. Hydrants on adjacent properties shall not be considered available unless fire apparatus access roads extend between properties and easements are established to prevent obstruction of such roads.

Hydrants that are separated from the subject building by railroad tracks, bridges, arterial streets or differing grades shall not contribute to the required number of hydrants, unless approved by the Fire Code Official.

Hydrants that are separated from the subject building by interstate highways, divided highways, or roadways with raised medians shall not contribute to the required number of hydrants.

UNDERGROUND FIRE LINES

All underground water lines serving fire protection systems shall be installed in accordance with State of Colorado regulations 8 CCR 1507-11 and NFPA 24: *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*. New underground fire lines shall be inspected and approved by a Certified Fire Inspector. All installations shall be documented using the Contractor's Material and Test Certificate for Underground Piping, or other approved form. All contractors installing underground fire line shall possess and maintain current and valid State of Colorado, Division of Fire Prevention and Control as a Fire Protection System Contractor-Underground.

The following requirements will be verified during the field inspection process:

Superflush

Underground piping from the municipal water supply to the system riser, including all lead-in connections to the system riser and any associated fire hydrants, shall be completely flushed before the connection is made to downstream fire protection system piping. The flushing operation shall continue until water flow is verified to be clear of debris. The minimum rate of flow shall be in accordance with NFPA 24 Table 10.10.2.1.3.

Hydrostatic Testing

Hydrostatic testing shall be completed in accordance with NFPA 24 Sections 10.10.2.2.1 through 10.10.2.5.2.

Hydrostatic testing should be completed before the piping joints are covered, so that any leaks can be detected. Thrust blocks should be sufficiently hardened before hydrostatic testing is begun. If the joints are covered and backfilled prior to testing, the contractor remains responsible for locating and correcting any leakage in excess of that permitted.

Acceptable test results shall be determined by indication of either a pressure loss of less than 5 psi, as shown on the attached gauge, and/or by no visible leakage, as determined by the fire inspector.

The trench shall be backfilled between piping joints prior to the test, to prevent pipe movement.

Where required for safety measures presented by the hazards of open trenches, the pipe and joints shall be permitted to be backfilled, provided the installing contractor takes the responsibility for locating and correcting leakage.

ADDRESSING AND STREET NAMES

The naming of streets and assignment of addresses is a responsibility of the municipality (town and/or county). Front Range Fire Rescue reviews proposed street names and addresses as a “second set of eyes” to ensure that street naming and addressing conventions are followed. Additionally, this serves as a valuable opportunity to ensure that duplicate street names in different communities are avoided.

Within Larimer County, all municipalities have agreed to abide by roadway naming standards designated in multiple documents, such as the Street Inventory System, Approved Suffixes, and Rules of the Streets. These requirements can be found at: www.larimer.org/streets/ An additional approval process is required by the involvement of the Larimer Emergency Telephone Authority (LETA). LETA must also approve all proposed street names prior to final plat. To contact LETA, please call 970-962-2170 or visit their website at <http://leta911.org>.

Street or Road Signs

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 shall be maintained until replaced by permanent signs.

Building Identification

All new and existing buildings shall have approved address numbers, building numbers, or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. The color of the numbers shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum size and stroke width, related to the size of the structure. 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 Numeral Size and Location

Approved address numerals shall be visible from the street fronting the property. Address numbers for any commercial or industrial building shall be placed high enough to be clearly visible from the street. Depending upon the building arrangement, a new building may be required to post address identification in more than one location.

New residential buildings that contain not more than two dwelling units shall have minimum 4-inch-high numbers with a minimum stroke width of ½ inch. Individual suite or unit addresses shall be displayed with minimum 4-inch-high numbers with a minimum stroke width of ½ inch.

New multiple family or commercial buildings shall have minimum 6-inch-high numbers with a minimum stroke width of one (1) inch, with larger numbers required based on building size and set-back from the roadway.

New buildings three or more stories in height, or with a floor area of 15,000 to 100,000 square feet, shall have minimum 8-inch-high numbers with a minimum stroke width of one (1) inch. Buildings with a total floor area of greater than 100,000 square feet shall have minimum 12-inch-high numbers with a minimum stroke width of two (2) inches. Where building setback exceeds 100 feet from the street or access road, additional numbers shall be displayed at the property entrance.

The Fire Code Official may require address numbers to be displayed on more than one side of the building and may require the street name to be displayed along with the address numbers.

KEY BOXES

Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life saving or firefighting purposes, the Fire Code Official is authorized to require a key box to be installed in an accessible location. The key box shall be of an approved type listed in accordance with UL 1037 and shall contain keys to gain access as required by the Fire Code Official.

FRFR requires a key box to be installed on any building with a monitored fire protection system. FRFR will designate the approved location(s) for key box installation. More than one key box may be required to be installed due to the size or use of a structure. The number of required key boxes will be determined at the time of site or building permit review.

The top of the key box shall be installed 60 to 72 inches above the finished grade.

Information on ordering key box supplies from the Knox Company can be found by visiting their website at www.knoxbox.com. Simply click the red “BUY” box, select Colorado, and enter Front Range Fire Rescue in the local fire department box.

CONTRACTOR LICENSING AND/OR REGISTRATION

All contractors designing, installing, servicing and/or repairing fire protection systems within FRFR jurisdiction are required to possess and maintain current certification, licensure and/or registration that is required by local, state and/or federal governing bodies.

All persons performing installation and/or repair of fire sprinkler systems are required to possess and maintain valid Registration with the State of Colorado Division of Fire Prevention and Control. This registration may be verified in the field by FRFR inspectors at any time.

On every job site where work is being done on a fire protection system, there must be at least one supervisor and/or employee who possesses the required certification, license and/or registration.

The Compliance Engine

All contractors performing inspections, testing and/or maintenance of fire protection systems within FRFR jurisdiction must register with The Compliance Engine via their website (thecomplianceengine.com), and upload reports for all work completed on these systems.

GENERAL CONSTRUCTION AND FIRE PROTECTION SYSTEM PERMITS AND INSPECTIONS

Front Range Fire Rescue (FRFR) will issue permits to Applicants after the plan review process has been completed and plans have been confirmed as complying with the adopted fire code. The Applicant shall be responsible for obtaining valid permits from the municipal jurisdiction (e.g., Town of Milliken, Town of Johnstown, or County) in addition to any FRFR required permits.

FRFR will perform periodic inspections for all permits issued by the district. A final inspection from FRFR is required in order for the owner/occupant to obtain a Certificate of Occupancy (CO) or Letter of Completion prior to occupying the building. FRFR inspectors will complete rough wiring inspections for fire alarm system projects. Final inspections for FRFR building permit (general construction) and fire protection systems (fire alarm, fire sprinkler, commercial hood system, etc) shall be scheduled for the same time and all applicable contractors must be present for testing and inspecting. For these multi-systems inspections, the general contractor or owner is responsible for coordinating with all involved sub-contractors and FRFR for attendance. For inspections that only involve fire protection systems, the fire protection system contractor shall be responsible for scheduling the inspection with FRFR.

Prior to scheduling any inspections, Contractors shall read all FRFR comments and/or conditions that were issued with the permit to ensure that all requirements have been met prior to scheduling the inspection.

The project address and permit number(s) must be provided when scheduling inspections.

To schedule an inspection with FRFR, please call (970)587-4464 or email Plans@FRFR.co at least 48 hours prior to the desired date and time of the inspection.

For all permit applications, the Applicant shall complete the appropriate permit application form and shall pay the appropriate non-refundable plan review and permit fees, as indicated on the FRFR Fee Schedule. All applicable fees shall be paid before permits are released.

FEE SCHEDULE AND IMPACT FEES

Pursuant to Section § 32-1-1002(1)(e), CRS, Front Range Fire Rescue's Board of Directors has adopted a fee schedule for all plans, permits, and other documents. The adopted fee schedule is included in this document as Appendix A.

Impact Fees

Impact fees are a one-time payment that is intended to fund the construction and expansion of public facilities needed to accommodate new development, as determined by level of service standards, with the intent being that new development pays for its proportionate share of the capital costs of additional infrastructure capacity to serve the new development. The developer must submit a signed Impact Fee Form with the other documentation required by the Town as part of the development permit application process. If the Town denies the application, the developer is not required to pay the Impact Fee or make

an In-Kind Contribution to FRFR. If the Town grants the application and issues a building permit, the developer must pay the Impact Fee and/or make the In-Kind Contribution, or enter into a written agreement with FRFR to make the In-Kind Contribution, before the Town will issue a Certificate of Occupancy in connection with the development. The Impact Fee Form is included in this document as Appendix B.

On December 3, 2018, the Town of Johnstown enacted ordinance number 2018-154, which amended the Town’s municipal code Section 17-230 to allow FRFR to collect impact fees beginning 12-13-2018.

On April 22, 2020, the Town of Milliken enacted ordinance number 781, which amended the Town’s municipal code section 18-1-710 to allow FRFR to collect impact fees beginning on 07-01-2020.

RESIDENTIAL	
UNIT TYPE	FEE PER DWELLING UNIT
Single Family* or Two-Family	\$1,087.00
Multi-Family	\$692.00
* A Townhome is a single-family home	
NON-RESIDENTIAL	
UNIT TYPE	FEE PER SQUARE FOOT
Any Non-Residential	\$0.60

FIRE SPRINKLER PERMITS

Submittals for fire sprinkler system permits shall include the following information. This list is not intended to be inclusive of all requirements for a fire alarm submittal, but rather as a guide to indicate minimum requirements.

- Completed Plan Review/Permit Application form
- One (1) complete set of all electronic plans for the building and all systems
 - If electronic submittal is not possible, then two (2) complete sets of printed plans (minimum 1/8” scale) shall be provided for review
- PE or NICET Level III stamps on all plans
- Minimum of one (1) set of material cut sheets
- Hydraulic calculations
- State of Colorado sprinkler form
- Water supply information
- Copy of current/valid State of Colorado Registration
- NFPA Working Plans Checklist

Fire Department Connections (FDCs) shall be provided for all buildings with installed fire sprinkler systems. The FDC shall be a five (5) inch Storz connection with a 30-degree downward angle.

FIRE ALARM PERMITS

Submittals for fire alarm system permits shall include the following information. This list is not intended to be inclusive of all requirements for a fire alarm submittal, but rather as a guide to indicate minimum requirements:

- Completed Plan Review/Permit Application form
- One (1) complete set of all electronic plans for the building and all systems
 - If electronic submittal is not possible, then two (2) complete sets of printed plans (minimum 1/8" scale) shall be provided for review
- PE or NICET Level III stamps on all plans
- Minimum of one (1) set of material cut sheets
- Voltage drop calculations
- Battery calculations
- Symbols list
- Sprinkler riser diagram

Every building with a monitored fire alarm system shall have a Knox box installed at approved location.

All fire alarm system wiring shall be red in color.

FRFR will perform all fire alarm system rough wiring inspections if the inspections are not completed during building's electrical inspection. This inspection is separate and independent from the Town's rough wiring inspection of the overall building electrical system.

COMMERCIAL KITCHEN HOOD SUPPRESSION AND DUCT EXHAUST SYSTEMS

Any commercial cooking that produces grease-laden vapors must be performed beneath an approved hood system that includes fire suppression capabilities. Installation and/or modification of any commercial kitchen hood system requires FRFR plan review and permit prior to changes being made.

Commercial kitchen hood suppression systems must meet the following requirements:

- Comply with NFPA 13, NFPA 17, and UL 300 standards, as well as adopted International Fire Code, International Building Code, International Mechanical Code, and any applicable local amendments and/or rules.
- Design plans must show interconnection for fuel supply and electrical shut-off, ventilation control, damper control, and associated ducting systems.
- All commercial kitchen hood systems must be electronically monitored by an approved fire alarm system as a dedicated zone.
- Appropriate Class K portable fire extinguishers properly mounted within 30 feet of the cooking location.
- A manual system actuator must be provided at least 10 feet, and not more than 20 feet, from the cooking location.

The following information shall be included with all permit submittal packages:

- Copy of the design/installation contractor's applicable state license/registration
- Completed FRFR Plan Submittal Application form with complete and correct project information
- Complete set of all material cut sheets
- Complete project plans to show all cooking locations, all suppression system information and all exhaust duct specifications.
- If printed plans are provided, a minimum of two (2) complete set of plans, printed to 1/8th inch scale shall be provided

PUBLIC SAFETY RADIO AMPLIFICATION SYSTEM

Section 510 of the adopted 2018 International Fire Code requires that all new buildings shall have approved radio coverage for emergency responders within the building, measured at the exterior of the building.

Radio amplification systems shall be designed and installed in accordance with Section 510 of the 2018 IFC as well as NFPA 70 and NFPA 1221. The emergency responder radio enhancement system shall be monitored by the building's automatic fire alarm system.

NFPA 1221, Section 5.5: Wiring Inside Buildings:

Fire-resistive cable systems shall be designed and installed in accordance with NFPA 70, Article 728. All wiring systems associated with or connected to the building's fire alarm system shall be designed and installed in accordance with NFPA 70, Article 760.

1. All wiring shall be installed so that it is protected from physical damage
2. Where fire survivability is required, a listed electrical circuit protective system or a fire-rated cable that is listed to maintain circuit integrity shall be used.
3. Where installed in buildings, conductors and fiber-optic cables shall be installed in accordance with NFPA 70 in any one of the following wiring methods:
 - a. Electrical metallic tubing
 - b. Intermediate metal conduit
 - c. Rigid metal conduit
 - d. Surface metal raceways
 - e. Reinforced thermosetting resin conduit

NFPA 72, Section 24 pathway survivability requirements:

In accordance with 24.3.13.8.1, emergency responder radio coverage systems shall have a pathway survivability of Level 1, Level 2 or Level 3. Level 1 survivability is only permitted if the entire building is fully protected by an approved automatic fire sprinkler system. If leaky feeder cable is utilized as the system antenna, it shall not be required to be installed in a metal raceway.

1. The feeder and riser coaxial cables shall be rated as plenum cables.
2. Riser coaxial cables shall be rated as riser cables and routed through a 2-hour-rated enclosure.
3. The connection between the riser and feeder coaxial cables shall be made within the 2-hour-rated enclosure, and passage of the feeder cable in and out of the enclosure shall be firestopped to 2-hour ratings.

HAZARDOUS MATERIALS ANALYSIS

Proposed structures that are intended to contain materials that pose a health and/or physical risk, as defined in the Fire Code, and if used, stored or handled on site, must submit a completed Hazardous materials Impact Statement (HMIS) to FRFR at the time of building permit application. The HMIS must be prepared by a licensed design professional in accordance with Chapter 50 – General Provisions for Hazardous Materials, Tables 5003.1.1(1) through 5003.1.1(4), and Fire Code Appendix E – Hazard Categories. The HMIS shall include the following information for each material:

- Product name
- Component(s)
- Chemical Abstract Service (CAS) Number
- Location(s) where stored and/or used
- Container size
- Hazard classification
- Amount in storage
- Amount in use – closed systems (no vapors escaping to the atmosphere)
- Amount in use – open systems (vapors may escape to the atmosphere)
- Maximum Allowable Quantity (MAQ)
- MAQ Exceeded (yes or no)

Front Range Fire Rescue can provide worksheets to assist design professionals with submitting the required hazardous materials information. The worksheets were designed based on the four tables from Chapter 50 of the Fire Code listed above. Completion of these worksheets will help provide very valuable information to ensure that the property Occupancy Group of the structure and/or area is determined.

REQUIREMENTS DURING CONSTRUCTION AND/OR DEMOLITION

Please refer to Chapter 33 of the adopted International Fire Code for additional information and specifications on fire safety during construction and demolition.

Construction Site Access

General Contractor shall provide FRFR Knox Padlocks to all security gates.

Building address shall be clearly posted and displayed throughout all phases of construction.

Prior to combustible construction occurring on the building, emergency vehicle access must be provided to within 150 feet of 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. The road surface must be asphalt, concrete or another approved, all-weather surface capable of supporting 40 tons. If the surface is not asphalt or concrete, plans must include the stamp of a professional engineer to verify the surface is all-weather and able to accommodate fire apparatus weight (40 tons).

Hazardous Materials

If any above-ground storage tanks of 500 gallons or more are used for dispensing of gasoline and/or diesel during any stage of construction, please provide a detailed site plan showing intended location, as well as detailed specifications and information on contents. Associated safety/control measures must be

clearly defined, including spill containment and vehicle impact protection. FRFR requires plan review, permitting, and inspection prior to tank installation.

Fire Hydrants - General Requirements

All hydrants shall be in place and operational prior to any combustible material being brought on site.

The main outlet shall be facing the street/parking lot with a minimum 18-inch clearance from the finished grade to the center of the main outlet connection.

Hydrants shall be set back at least three (3) feet from the curb face and shall be at least three (3) feet from vegetation at full maturity (with the exception of grass and ground cover), as well as fences, bushes, trees, walls or any other fixed or moveable object. Minimum six (6) feet overhead clearance shall be provided for each hydrant.

APPENDICES

Appendix A - FRFR Fee Schedule

Appendix B - Impact Fee Form

Appendix C - Hazardous Materials Management Plan Information

Appendix D - Plan Review/Permit Application Form

Appendix E - Fire Protection Requirements (2018 IFC)

Appendix F - Weld County Fire Code Amendments

Appendix G - Town of Johnstown Fire Code Amendments

Appendix H - Town of Milliken Fire Code Amendments

Appendix I - NFPA Working Plans Checklist