



Loveland Fire Rescue Authority's

FIRE CODE DEVELOPMENT GUIDE

2018 International Fire Code



WELCOME TO LOVELAND FIRE RESCUE AUTHORITY

Loveland Fire Rescue Authority (LFRA), in Loveland, Colorado, is recognized nationally for excellence in providing fire, rescue, emergency medical and hazardous materials response and Community Safety and Risk Reduction services. Formerly the City of Loveland Fire Department and the Loveland Rural Fire Protection District, the two jurisdictions consolidated in 2012 to form LFRA. The authority's 194 square miles includes the City of Loveland, the Interstate 25/US Highway 34 area of Johnstown, and unincorporated areas of Larimer County.

In addition to the 103,000 residents living within the LFRA jurisdiction, thousands of visitors travel through the area each year, as it's the gateway to Rocky Mountain National Park, the Big Thompson Canyon and countless other recreational and cultural opportunities in the Rocky Mountains.

ABOUT THE LFRA FIRE CODE DEVELOPMENT GUIDE

The goal of development review is the same for Loveland Fire Rescue Authority as it is for property owners, building designers and construction contractors: to build structures that are attractive and functional; safe for occupants and firefighters for the life of the buildings; and built in a cost-effective manner.

This Fire Code Development Guide provides assistance in the application of the 2018 International Fire Code and locally adopted standards, National Standards, Larimer County Design Standards, LFRA policies and best practices for design of property development, to licensed design professionals, contractors and business owners. Applying the 2018 IFC and local amendments ensures the requirements are **clear** and **consistent**, and that buildings **meet minimum life safety for occupants**.

The Guide is organized with general permitting and fee information at the beginning, then provides site-design requirements for fire apparatus access, firefighting water supply, addressing, radio amplification, key boxes and hazardous materials submittals for new construction.

THIS GUIDE REPRESENTS THE MOST COMMONLY ASKED DEVELOPMENT QUESTIONS; IT DOES NOT CREATE OR REPLACE CODE PROVISIONS. THE REQUIREMENTS PROVIDED MEET THE MINIMUM LIFE-SAFETY STANDARDS. HOWEVER, EACH PROJECT IS UNIQUE AND BECAUSE OF ASSOCIATED RISKS, ADDITIONAL REQUIREMENTS MAY BE NEEDED TO PROTECT THE STRUCTURES AND OCCUPANTS. READERS ARE CAUTIONED THAT THE INFORMATION IN THIS GUIDE MAY OR MAY NOT APPLY TO THEIR SPECIFIC SITUATION, AND THAT LFRA, AS THE AUTHORITY HAVING JURISDICTION, RETAINS FINAL AUTHORITY TO DETERMINE COMPLIANCE.

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GETTING STARTED: PLANNING APPROVAL AND BUILDING PERMIT PROCESSES

For most proposed commercial and residential developments, new buildings and building additions, the first step is for the applicant to receive approval of planning documents, which include site development plans, plats and public improvement construction plans, and then approval of building permit construction drawings.

LOVELAND FIRE RESCUE AUTHORITY'S COMMUNITY SAFETY DIVISION REVIEWS PLANNING DOCUMENTS AND BUILDING PERMIT SUBMITTALS FOR PROJECTS WITHIN ITS THREE GOVERNMENTAL JURISDICTIONS: THE CITY OF LOVELAND, LFRA'S RURAL FIRE PROTECTION DISTRICT IN UNINCORPORATED LARIMER COUNTY, AND THE TOWN OF JOHNSTOWN NEAR INTERSTATE 25 AND US HIGHWAY 34. IF A PROJECT REQUIRES A PLANNING REVIEW OR BUILDING PERMIT IN ANY OF THE THREE JURISDICTIONS, LFRA MUST BE PART OF THE REVIEW PROCESSES.

Before beginning any new-construction or remodel project, the applicant (owner, developer and/or contractor) must contact the appropriate Planning and Building Departments to obtain planning approval and building (construction) permits.

For more information, contact the department where your site is located:

City of Loveland Building Division: (970) 962-2346

<http://www.cityofloveland.org/departments/development-services/building-division>

City of Loveland Planning Department: (970) 962-2523

<http://www.cityofloveland.org/departments/development-services/current-planning>

Larimer County Building Department: (970) 498-7700

<https://www.larimer.org/building>

Larimer County Planning Department: (970) 498-7679

<https://www.larimer.org/planning>

Town of Johnstown Planning and Zoning: (970) 587-4664

<http://www.townofjohnstown.com/103/Planning-and-Zoning>

Town of Johnstown Building Department: (970) 587-4664

<http://www.townofjohnstown.com/63/Building-Permits>

Remember that additional approvals may be necessary to start a business: a sales tax license, utility service, liquor license, food vendor license and sign permits are a few examples that may be required. Planning or Building staff in the three jurisdictions can direct you if you have questions.

FIRE PROTECTION SYSTEM REQUIREMENTS AND PERMITTING

During the development review process, it will be determined if fire protection systems (fire alarms and/or fire suppression) are required for the project. These requirements are specified in the locally adopted International Fire Code and International Building Code. LFRA building-permit comments specify when construction is required to have fire-protection systems and the permits to install these systems.

Fire protection systems include fire sprinklers, fire alarm, spray (paint/flammable finish) booths, commercial cooking extinguishing systems, clean-agent suppression, fire pumps, etc.

FIRE-PROTECTION SYSTEM PERMITS ARE REQUIRED PRIOR TO THE INSTALLATION OF A NEW FIRE PROTECTION SYSTEM OR MODIFICATION OF AN EXISTING SYSTEM. SUBMITTAL OF DRAWINGS AND MATERIAL SHEETS IS MADE DIRECTLY TO LFRA COMMUNITY SAFETY DIVISION. THE CONTRACTOR SUBMITTING THE APPLICATION MUST HAVE A CURRENT CONTRACTOR LICENSE WITH LFRA AND THE DRAWINGS MUST BE STAMPED BY A NICET 3 OR 4 LEVEL ENGINEER.

For more information, visit <https://lfra.org/our-services/community-safety-fire-prevention/services-construction-development/csd-permits/>.

2018 INTERNATIONAL FIRE CODE

LFRA enforces the fire protection system requirements from the 2018 International Fire Code and most current edition of NFPA standards. Free access to the 2018 IFC can be found at this link:

<https://codes.iccsafe.org/content/IFC2018P3>

Local amendments to the 2018 IFC can be found at these links:

- City of Loveland - <https://lfra.org/wp-content/uploads/6378.pdf>
- Town of Johnstown - <https://lfra.org/wp-content/uploads/Ordinance-Number-2019-165-Building-Code-Updates.pdf>
- Unincorporated Larimer County – <https://lfra.org/wp-content/uploads/LRFPD-2018-IFC-Resolution-Signed-by-BOCC.pdf>

NFPA STANDARDS

Access to NFPA standards can be found here:

<http://www.nfpa.org/Codes-and-Standards/All-Codes-and-Standards/Free-access>

LFRA REVIEW AND PERMITTING FEES

Permit fee estimates for Building Permits, Fire Protection System Permits and Impact Fees are available on the LFRA website or upon request from the Community Safety Division. *Please note that these are estimates only and not cost quotes, as the project valuation can change, fee schedules may change, etc. It is the responsibility of the applicant or contractor to confirm the actual permit fees with CSD, if desired, prior to payment and issuance of permit.*

To obtain a fee estimate for LFRA permits, use the fee estimator link (<https://lfra.org/our-services/community-safety-fire-prevention/services-construction-development/csd-permits/>) and click on the “Permit Fees” tab, or call the Community Safety Division at (970) 962-2537.

LFRA REQUIREMENTS FOR DEVELOPMENT DESIGN

NOTE TO USERS: THIS GUIDE DOES NOT CREATE OR REPLACE CODE PROVISIONS. THE REQUIREMENTS PROVIDED MEET THE MINIMUM LIFE-SAFETY STANDARDS OF THE 2018 INTERNATIONAL FIRE CODE. HOWEVER, EACH PROJECT IS UNIQUE AND BECAUSE OF ASSOCIATED RISKS, ADDITIONAL REQUIREMENTS MAY BE NEEDED TO PROTECT THE STRUCTURES AND OCCUPANTS. READERS ARE CAUTIONED THAT THE INFORMATION IN THIS GUIDE MAY OR MAY NOT APPLY TO THEIR SPECIFIC SITUATION, AND THAT LFRA, AS THE AUTHORITY HAVING JURISDICTION, RETAINS FINAL AUTHORITY TO DETERMINE COMPLIANCE.

EMERGENCY VEHICLE ACCESS

OBSTRUCTION OF FIRE APPARATUS ACCESS ROADS: Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum requirements established in Section 503 and Appendix D shall be maintained at all times.

FIRE APPARATUS ACCESS ROAD WIDTH AND VERTICAL CLEARANCE: 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.

FIRE APPARATUS ACCESS ROAD WIDTH AND “FIRE LANE NO PARKING” SIGNS:

Roads 20 to 26 feet wide shall be posted on both sides as a fire lane. Roads 26 to 32 feet wide shall be posted on one side as a fire lane. Roads wider than 32 feet are not typically required to have fire lane signage.

AERIAL FIRE APPARATUS ROAD: Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet, approved aerial fire apparatus access roads shall be provided. The highest roof surface is measured to the eave of a pitched roof, the intersection of the roof to the exterior wall or the top of parapet walls, whichever is greater.

AERIAL FIRE APPARATUS ROAD WIDTH: 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.

AERIAL FIRE APPARATUS ROAD PROXIMITY TO BUILDING: At least one of the required aerial fire apparatus access routes shall be located 15-30 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, and smoke tower landings. The side(s) of the building with aerial access shall be approved by the Fire Code Official.

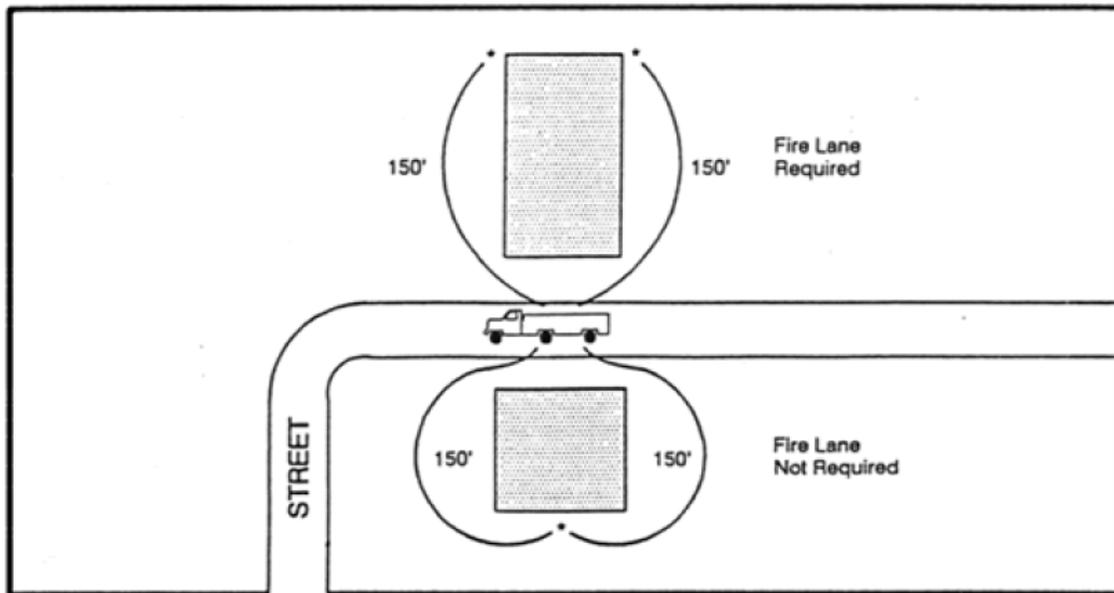
FIRE LANE – NO PARKING SIGNS AND/ OR PAINTED CURBS: Where required by the Fire Code Official, fire apparatus access roadway curbs shall be painted red at approved locations and/or approved Fire Lane – No Parking signs shall be installed. Paint and signs shall be installed and maintained by the property owner. See Larimer County Urban Area Street Standards (LCUASS) Drawing 1418 for Fire Lane – No Parking sign and LCUASS Drawing 1419 for curb paint and stenciling:

http://www.larimer.org/sites/default/files/apdxa_1101_1420.pdf

Signs shall be installed with a clear space above grade level of 7 feet and shall be installed 45 degrees from flow line. For additional information regarding sign installation, see LCUASS Drawing 1401:

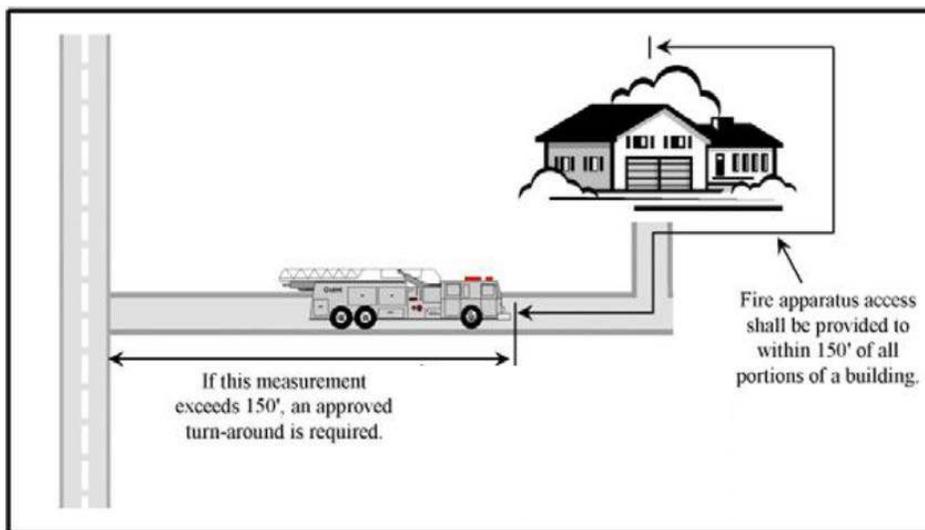
http://www.larimer.org/sites/default/files/apdxa_1101_1420.pdf

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. See Drawing 1. *Exception: For buildings equipped with an approved fire sprinkler system, the distance may be increased to 300 feet.*



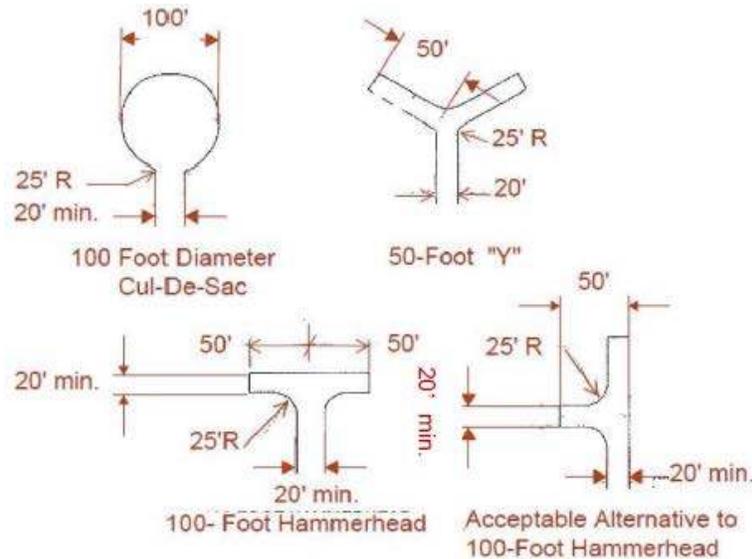
Drawing 1: Fire Apparatus Access Road Distance from Buildings

DEAD-END ROADS: Dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround. See Drawing 2.



Drawing 2: Dead-end Roads

TURNAROUND DIMENSIONS: Within the boundaries of Loveland Fire Rescue Authority, approved turnaround dimensions include the following designs. See Drawing 3.



Drawing 3: Turnaround Dimensions

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 82,000 pounds live load (gross vehicle weight). LFRA may require documentation from a registered engineer that the finished construction is in accordance with the approved plans or the requirements of the 2018 IFC.

TURNING RADIUS: The inside turning radius and outside turning radius shall be not less than 25 feet and 50 feet respectively, measured from the same center point.

VEHICLE DESIGN SPECIFICATIONS: LFRA apparatus specifications include the following:

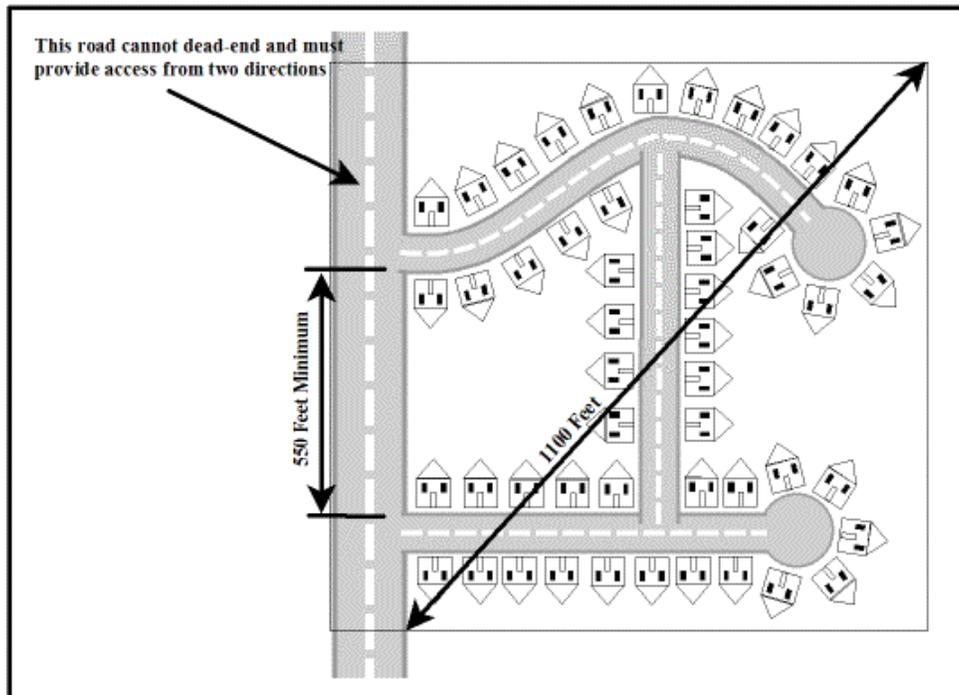
- Wheelbase: 268.5 inches
- Front axle to front rear axle: 243.5 inches
- Front axle to rear rear axle: 295.5 inches
- Total length: 47 feet, 6 inches
- Total width at front tires: 103 inches
- Total width (including mirrors): 106 inches
- Total height: 12 feet, 1 inch (IFC minimum overhead clearance is 13 feet, 6 inches)
- Weight: 82,000 pounds

GRADE: Fire apparatus access roadway grades shall not exceed 10 percent. Intersections and turnarounds shall be level with the exception of crowning for water run-off.

TRAFFIC CALMING DEVICES: 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.

MULTIPLE ACCESS ROADS: Approved fire apparatus access roads shall be required for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. A minimum of two fire apparatus access roads are required, unless they cannot be installed because of location on property, condition of terrain, topography, waterways, non-negotiable grades or similar conditions exist, and an approved alternative means of fire protection is provided.

MULTIPLE ACCESS ROADS SEPARATION: Where two access roads are required, they must 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. The fire code official may reduce the required separation when all buildings served by the access roads are equipped throughout with an automatic sprinkler system and the site constraints do not allow full separation. See Drawing 4.



Drawing 4: Multiple Access Roads Separation

CUL-DE-SAC: If two fire apparatus access roads cannot be installed and the cul-de-sac exceeds 660 feet in length, all buildings beyond 660 feet from the entrance (roadway centerline) to the cul-de-sac are required to be protected by an approved automatic fire-sprinkler system. In the City of Loveland, if commercial or residential structures install fire sprinkler systems, the fire marshal may approve a maximum cul-de-sac length to 1,000 feet before a second access is required. (Larimer County Urban Area Street Standards 7.6.1.B)

BRIDGES AND ELEVATED SURFACES: Where a bridge or an elevated surface is part of a fire apparatus access road, either 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 LFRA 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). LFRA 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.

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

- Minimum unobstructed width shall be 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.
- Gate components shall be maintained in an operative condition at all times, and 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 gate operators, when required, shall be listed in accordance with UL 325.
- Electric gates shall be equipped with a means for operation by fire department personnel (siren activation or Knox Key Switch). LFRA will not accept access only via a private keypad.
- Manual opening gates shall not be locked with a padlock, unless they are capable of being opened with forcible entry tools. All locking devices shall be approved by LFRA. A Knox Padlock or Knox Box may be required to ensure rapid access by fire personnel.

FIRE APPARATUS ACCESS ROAD EXCEPTION FOR AUTOMATIC SPRINKLER

PROTECTION: When buildings are protected throughout with an approved automatic fire sprinkler system (NFPA 13, NFPA 13R or NFPA 13D, as required by the IFC), the requirements for fire apparatus access may be modified as approved by the Fire Code Official.

FIRE FIGHTING WATER SUPPLY

MULTI-FAMILY AND COMMERCIAL BUILDINGS 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 Tables B105.1 and B105.2 (see following page) in the locally adopted amendments. 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 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.

FIRE-FLOW REQUIREMENTS FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES: In the urban fire-flow area, the minimum fire-flow and flow duration requirements for one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses up to 3,600 square feet in area shall be 1,000 gpm, with a flow duration of 1 hour. In rural fire-flow areas, minimum fire-flow and flow duration shall be 500 gallons per minute and 1 hour for one- and two-family dwellings, Group R-3 and R-4 and townhomes less than 3,600 square feet in area. For any one- and two-family dwellings, Group R-3 and R-4 and townhouses exceeding 3,600 square feet in area, regardless of location, minimum fire-flow and flow duration requirements shall be as specified in Table B105.1.

EXCEPTION: THE FIRE CODE OFFICIAL IS AUTHORIZED TO DECREASE THE MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES PROTECTED BY AN APPROVED AUTOMATIC SPRINKLER SYSTEM.

TABLE B105.1
AREA, FIRE FLOW AND DURATION

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	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	
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	4
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.

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

AUTOMATIC SPRINKLER SYSTEM (Design standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATIONS (hours)
No automatic sprinkler system	Value in Table B105.1	Duration in Table B105.1
Section 903.1.1 of the International Fire Code	25% of the value in Table B105.1 ^a	Duration in Table B105.1 at the reduced flow rate
Section 903.3.1.2 of the International Fire Code	25% of the value in Table B105.1 ^b	Duration in Table B105.1 at the reduced flow rate

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

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

REQUIRED HYDRANT SPACING: Spacing of hydrants shall be as follows:

APPLICATION	SPACING BETWEEN HYDRANTS (feet) ^{a,b}	MAXIMUM DISTANCE FROM THE CLOSEST POINT ON A BUILDING TO A HYDRANT (feet)
Buildings other than one- and two-family dwellings, Group R-3 and R-4, and townhouses	350	400 ^c
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

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, a fire hydrant shall be located within 150 feet of the FDC, using an approved route without obstacles. The hydrant and fire department connection shall be on the same side of the fire apparatus access road or parking lot drive aisle, unless otherwise approved by the fire code official. **Exception:** The distance shall be permitted to exceed 150 feet where approved by the fire code official.

MINIMUM NUMBER OF HYDRANTS: Minimum number of hydrants shall be as follows:

FIRE-FLOW REQUIREMENT (gpm)	MINIMUM NUMBER OF HYDRANTS
1,750 or less	1
1,751–2,250	2
2,251–2,750	3
2,751–3,250	3
3,251–4,000	4
4,001–5,000	5
5,001–5,500	6
5,501–6,000	6
6,001–7,000	7
7,001 or more	8 or more

CONSIDERATIONS FOR LOCATING HYDRANTS:

- Existing hydrants in the area are allowed to be considered to meet the required number of hydrants as approved. Hydrants on adjacent properties shall not be considered available unless fire apparatus access roads extend between properties and easements are established to prevent obstructions 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 or divided highways shall not contribute to the required number of hydrants.

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.

FIRE DEPARTMENT CONNECTION: The sprinkler/standpipe Fire Department Connections (FDC) shall be a 5-inch Storz connection with a 30-degree downward bend for NFPA 13 systems or a single 2.5-inch connection for an NFPA 13R system. Hydrants and FDCs shall be located on the same side of the fire apparatus access roadway as the building being protected. The location of the FDC shall be approved by the Fire Code Official.

FIRE HYDRANT PROXIMITY TO FIRE DEPARTMENT CONNECTION: A fire hydrant shall be located within 150 feet of an automatic sprinkler/standpipe Fire Department Connection (FDC).

FDC SIGNAGE REQUIRED: A permanent sign shall be installed at the FDC, specifying fire sprinkler, sprinkler and standpipe, or standpipe. When an FDC serves multiple addresses and/or only portions of buildings (such as a basement or standpipe), permanent signs shall be installed at the FDC identifying the locations served by the FDC.

WATER DISTRICTS: LFRA is served by five water districts. Each district may have requirements unique to its service area. For additional information, contact the water district serving your project.

City of Loveland Water: (970) 962-3000

<http://www.ci.loveland.co.us/departments/water-and-power>

Town of Johnstown Utilities: (970) 587-4664

<http://www.townofjohnstown.com/93/Utilities>

Little Thompson Water District: (970) 532-2096

<http://www.ltwd.org>

Fort Collins-Loveland Water District: (970) 226-3104

<http://www.fclwd.com>

North Carter Lake Water District: (970) 776-8212

<http://www.nclwd.org>

FIRE FLOW TESTING: To schedule hydrant flow testing, contact the water district that serves the property. Approved documentation of the test shall be provided to LFRA prior to final approval of the water supply system.

ADDRESSING

STREET NAMING STANDARDS IN LARIMER COUNTY: All municipalities in Larimer County have agreed to abide by roadway naming standards designated in multiple documents, such as the Street Inventory System, Approves Suffixes and “Rules of the Streets.” These requirements are accessed at:

<http://www.larimer.org/streets/>

APPROVED STREET NAMES IN THE CITY OF LOVELAND: In addition to Larimer County street-naming practices, the City of Loveland’s Municipal Code designates specific street-name categories for geographical areas of the city. These requirements may be accessed in Chapter 12.08:

<http://www.cityofloveland.org/home/showdocument?id=66>

The Larimer Emergency Telephone Authority (LETA) also must approve all proposed street names prior to final platting and development. For more information, contact LETA at (970) 962-2170, or online at

<http://leta911.org>.

PREMISES IDENTIFICATION: 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.

ADDRESSING AND PREMISES IDENTIFICATION REQUIREMENTS: New and existing buildings or facilities shall be provided with approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Address identification characters shall contrast with their background. Address numerals shall be Arabic numbers and street names, if required to be installed with the numerals, shall be alphabet letters. Numbers shall not be spelled out with alphabet letters. Address identification shall be maintained.

- Addresses shall be assigned by the governmental entity having jurisdiction (City of Loveland, Town of Johnstown or Larimer County) and shall comply with the Larimer County Street Naming and Addressing Standards as contained in the Larimer County Urban Area Street Standards.
- The approved address numerals shall be visible from the street fronting the property, and posted on a contrasting background. Bronze or brass numerals shall not be posted on a brick background.
- The address numerals for any commercial or industrial buildings shall be placed at a height to be clearly visible from the street. Where required by the fire code official, address identification shall be provided in additional, approved locations to facilitate emergency response.
- 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.
- Commercial or multiple-family buildings shall have numerals with a minimum height of six inches and stroke width of one-half inch. Buildings three or more stories in height or with a total floor area of 15,000 to 50,000 square feet, shall have numerals with a minimum eight-inch height and stroke width of one inch. Buildings with a total floor area of 50,000 square feet or greater shall have numerals with a minimum height of 12 inches and stroke width of 1.5 inches.
- Residential buildings that contain not more than two dwelling units shall have a minimum four-inch high numerals, with a minimum stroke width of one-half inch.
- Individual suite or unit addresses shall be displayed with minimum four-inch high numerals, with a minimum stroke width of one-half inch.
- Monument signs shall not be used in lieu of address numerals on the building.
- Buildings with multiple suites, apartments or units shall have the individual suites, apartments or units provided with individual identification numbers in an approved, sequential order. Suites, apartments or units located on the first floor shall be identified by numbers within the 100 or 1000 range or series; Suites, apartments or units located on the second floor shall be identified by numbers within the 200 or 2000 range or series; Suites, apartments or units located on the third floor shall be identified by numbers within the 300 or 3000 range or series. Higher floors shall follow this same numbering scheme. Floors below grade shall be identified with numerals within the 0100 range on the first floor below grade and 0200 on the second floor below grade; lower floors shall follow the same numbering pattern.
- Buildings, either individually or part of a multi-building complex, that have emergency access lanes on sides other than on the addressed street side, may be required to have the address numerals and street name on each side that fronts the fire lane(s).
- Buildings that are addressed on one street, but are accessible from an adjoining street, may be required to affix the address numerals and street name on each side that is adjacent to the other street(s).
- Approved signage shall be provided in conspicuous locations on or within buildings to provide clear direction to locate any suite, apartment or unit within the building.
- Multiple-building complexes shall be provided with approved signage as needed to direct first responders to individual buildings.

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 be maintained until replaced by permanent signs.

KEY BOXES

KEY BOXES – WHEN REQUIRED: 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 fire-fighting 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 code official.

LOCATIONS: LFRA will designate the approved location(s) for installation of key boxes. More than one key box may be required to be installed, due to the size or use of a structure. Number of required key boxes will be determined at time of site or building-permit review. The top of the key box shall be installed 60-72 inches above finished grade. Directions for how to order Knox products can be found by going to <http://lfra.org/our-services/community-safety-fire-prevention/services-construction-development/ordering-knox-box/>.

PUBLIC SAFETY RADIO AMPLIFICATION SYSTEM

EMERGENCY RESPONDER RADIO COVERAGE: All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. Existing buildings shall be provided with approved radio coverage for emergency responders as required by Chapter 11. Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with Federal Communications Commission (FCC)-certified signal boosters, or other systems approved by the Fire Code Official in order to achieve the required adequate radio coverage. Public-safety radio amplification systems shall be designed and installed in accordance with criteria specified in the IFC.

HAZARDOUS MATERIALS ANALYSIS

HAZARDOUS MATERIALS IMPACT STATEMENT Proposed structures that contain materials that pose a health or physical risk (as defined in the IFC) and if used, stored or handled on site, must have a Hazardous Materials Impact Statement (HMIS) completed and supplied to LFRA at time of building permit application. The analysis must be prepared by a licensed design professional, in accordance with Chapter 50 – General Provisions/Hazardous Materials; Appendix E – Hazard Categories; and Tables 5003.1.1(1) through 5003.1.1(4). The HMIS shall include the following:

- Product name
- Component
- Chemical Abstract Service (CAS) number
- Location where stored or used
- Container size
- Hazard classification
- Amount in storage (stored only, not in use)
- Amount in use – closed systems (no vapors escaping to the atmosphere)
- Amount in use – open systems (vapors escape to the atmosphere)
- Maximum Allowable Quantity (MAQ)
- MAQ Exceeded (Yes or No)

HAZMAT DESIGN WORKSHEETS: LFRA provides worksheets to assist design professionals in submitting required hazardous materials information. The worksheets are based on four tables from Chapter 50 of the IFC and provide direction in determining the Occupancy Group of the structure or areas. The worksheets can be found online at: <http://lfra.org/our-services/community-safety-fire-prevention/services-construction-development/hazardous-materials-construction/>

REQUIREMENTS DURING CONSTRUCTION AND DEMOLITION

VEHICLE ACCESS AND WATER SUPPLY DURING CONSTRUCTION: When fire apparatus access roads or water supply for fire protection is required to be installed, such protection shall be installed or made serviceable prior to and during the time of construction except when approved alternative methods of protection are provided. Approved vehicle access shall be provided to all construction and demolition sites. Vehicle access shall be provided to within 100 feet of temporary or permanent Fire Department Connections (FDCs). Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available. An approved water supply for fire protection, either temporary or permanent, shall be available as soon as combustible materials arrive on site.

TEMPORARY ADDRESS SIGN: Temporary address sign(s) with both the numeric and street name shall be installed at the entrance to construction sites in such a manner to be readily visible to vehicle traffic. The numerals and letters shall be of sufficient size and color to be visible from the street.

STANDPIPES: In buildings required to have standpipes by Section 905, not less than one standpipe shall be provided for fire department use during construction. Such standpipes shall be installed when the progress of construction is not more than 40 feet in height above the lowest level of fire department vehicles access. Such standpipes shall be provided with fire department hose connections at accessible locations adjacent to usable stairs. Such standpipes shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring. Standpipes shall be installed in accordance with 905 and 3313.3.

SEE ADDITIONAL REQUIREMENTS IN 2018 IFC CHAPTER 33 – FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION.

