



Grand Fire Protection District No. 1

Development Review Criteria

Standards and Codes to be used:

NFPA Standards including: 13, 24, 25, 299, 1142 (and others, most current edition)

International Fire Code (IFC): 2009

International Building Code (IBC): 2009

International Residential Code (IRC): 2009

American Association of State Highway and Transportation Officials (AASHTO)

Mountain Parks Electric Requirements

Public Service (Xcel Energy Requirements)

GFPD's Best Practices and Operating Guidelines

ACCESS

In addition to: IFC Appendix D, NFPA Standard 299- Protection of Life and Property from Wildfire, and road standards of the Town of Granby or Grand County.

ROADWAYS:

Minimum width of 24 feet with a hard all-weather surface sufficient to support 84,000 lb. fire apparatus. Shoulders are to be a minimum width of four feet on each side. The vertical clearance is to be a minimum of 18 feet. The maximum grade is to be 7% (See Grand County Road Specifications Section 3.5 for exceptions). Minimum curve radiuses to be 50 feet measured at centerline, or follow the AASHTO "Geometric Designs for Highways and Streets Manual", for Intercity Bus (BUS-45). At no more than 750 foot intervals, emergency turnarounds for fire apparatus are needed on all roads. (These can be oversized driveways, intersections or specially constructed areas). No parking is to be allowed along roadways. If parking is to be allowed, nine feet needs to be added to the width of road on either or both sides of roadway. Cul-de-sacs are to be avoided, but if necessary, a turnaround of 120 feet outside diameter minimum at the end is required and they are to be no more than 500 feet long. No cul-de-sacs created off of other cul-de-sacs. To avoid building construction delays, special attention should be given to IFC Chapters 5 and 14. Sections 501, 503, 505, 508, 1410, and 1412.

GATES:

Gates are to be avoided, but if necessary shall be considered on a case-by-case basis. If allowed, the design would need to be approved prior to construction. Gate should consist of a counterweight type barrier that swings completely free of the access when released. A "KNOX" key switch, or other approved device, shall operate the gate electronically.

DRIVEWAYS and ACCESSES:

Three homes or more need a road, not a driveway. The minimum driveway width should be 14 feet with a one-foot shoulder on each side. If the access or drive extends more than feet from a roadway there should be a turnaround adequate for fire trucks.

BRIDGES:

Bridges require a letter from an engineer with his/her stamp certifying that the bridge meets the requirements of the International Fire Code Section 503.2.6 which requires the bridge to be constructed and maintained in accordance with AASHTO "Standard Specification for Highway Bridges." Appendix D Section D102 (as amended) suggests the bridge be capable of carrying the load of 84,000 lbs. Any crossings shall be constructed to the same standards as the traveled way on either side.

MUNICIPAL WATER SUPPLY

Reference **Appendix B of International Fire Code**. Water supplies needed for firefighting would range between a minimum of 2,500 gallons per minute for two hours (minimum 180,000 gallons of fire protection storage) to 3,500 gallons per minute fire flow for three hours (minimum 630,000 gallons of fire protection storage). A minimum water supply of 1,500 gallons per minute fire flow for two hours (minimum 170,000 gallons of fire protection storage) will be considered in buildings protected by sprinkler systems. Documentation showing that adequate flows will be available from the water system at a residual pressure no less than 20 psi is required. By installing fire sprinkler systems in all structures, large life or property losses would be avoided and would make the best use of the available water supplies. Fire hydrants are to be located at a minimum of every 500 feet or as agreed to by the Fire District. Fire hydrant locations and distribution shall be in accordance with Appendix C of the 2009 International Fire Code. For planning purposes the following may be used:

Fire hydrants are to be located at least every 500 feet or as agreed to by the Fire District. Fire hydrants shall be Mueller Super Centurion 250 A-423 (or equivalent) hydrants with one 5 inch Storz, equipped with blind cap and chain, opening facing the road. Hydrants are to be installed with one 18-inch extension, with the traffic flange approximately two inches above finish grade, edge of pavement (road surface) or the back of walkway in accordance with manufacturer recommendations. The approach to the hydrant is to be a level-walking surface, free of obstructions or depressions, at least five feet from the center of the hydrant in all directions. Existing fire hydrants can be credited for a new development if the hydrant has at least one 4½-inch opening, a six inch barrel, is in good repair, is appropriately located, has adequate access, has adequate flows, and is not a Pacific States Hydrant. If any one of these conditions is not met it needs to be replaced. The 2009 International Fire Code tables B105.1 and C105.1 provide further guidance on flows and fire hydrant distribution.

RURAL WATER SUPPLY

In areas which adequate and reliable water supply systems do not exist, NFPA 1142 will be referenced as the guide. **Chapter 7 – Water Supply** and **Chapter 8 – Dry Hydrants** serve as primary requirements.

Approved Water Supply. Any water supply source used to meet the requirements of this standard shall be of a quality approved by the Fire Department. The water supply source shall be maintained

and accessible on a year-round basis. In locations where adequate municipal-type water systems are not provided and additional fire protection is needed, minimum water supplies shall be established in, or transportable to, the designated area. Unless otherwise permitted by the Fire Department, all approved nonpressurized water supply sources shall be accessible using dry hydrants that meet the requirements of this standard. To be acceptable, water supply sources shall maintain the minimum capacity and delivery requirements on a year-round basis, based on the 50-year drought for the water source.

Water Use Agreements. The Fire Department shall enter into a water use agreement when a private water supply source is to be used to meet the requirements of this standard.

Identifying Water Sources. A water source indicator approved by the Fire Department shall be erected at each water point identifying the site for Fire Department emergency use.

Fire Department Connections. Any fitting provided at a water source to permit a fire apparatus to connect to the water source shall be approved by the Fire Department and shall conform to NFPA 1963, *Standard for Fire Hose Connections*.

Access to Water Sources. Roads providing a means of access to any required water supply shall be constructed and maintained in accordance with the following:

1. Roadways shall have a minimum clear width of 12 ft. (3.7 m) for each lane of travel.
2. Turns shall be constructed with a minimum radius of 100 ft. (30.5 m) to the centerline.
3. The maximum sustained grade shall not exceed 8 percent.
4. All cut-and-fill slopes shall be stable for the soil involved.
5. Bridges, culverts, or grade dips shall be provided at all drainageway crossings; roadside ditches shall be deep enough to provide drainage with special drainage facilities (tile, etc.) at all seep areas and high water-table areas.
6. The surface shall be treated as required for year-round travel.
7. Erosion control measures shall be used as needed to protect road ditches, cross drains, and cut-and-fill slopes.
8. Where turnarounds are utilized during fire-fighting operations, they shall be designed with a diameter of 120 ft. (36.5 m) or larger, as required, to accommodate the equipment of the responding Fire Department.
9. Load-carrying capacity shall be adequate to carry the maximum vehicle load expected.
10. The road shall be suitable for all-weather use.
11. When a bridge is required to be used as part of a Fire Department access road, it shall be constructed and maintained in accordance with nationally recognized standards.
[1:18.2.3.4.5.1]
12. The bridge shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. [1:18.2.3.4.5.2]
13. Vehicle load limits shall be posted at both entrances to bridges where required by the FIRE DEPARTMENT. [1:18.2.3.4.5.3]

Mobile Water Supply Training. To promote operational safety and effectiveness, the Fire Department shall determine what training is required. (*See C.10.*)

Records. A record of each water supply shall be prepared and periodically updated. The records shall be retained in accordance with the record retention policy of the jurisdiction or state. Records

developed to meet the requirements of this Standard shall be retained for a minimum of 3 years after the agreement, facility, or equipment is no longer used for its original purpose.

General. The Fire Department shall ensure that generally accepted design practices are employed during the following:

- (1) Dry hydrant location planning
- (2) The permit process
- (3) Design criteria
- (4) Construction

Planning and Permits. The planning, permitting, and design processes shall be completed before the actual construction begins. Planning shall be coordinated among public and private entities that could be impacted by the installation of a dry hydrant. Required permits to install a dry hydrant shall be obtained prior to installation.

Dry Hydrant Design and Location. The Fire Department shall approve all aspects of the dry hydrant design and construction, including the type of materials, pipe size, and system fittings to be used. As a minimum, Schedule 40 pipe and component fittings shall be used. All dry hydrant systems shall be designed and constructed to provide a minimum flow of 1000 gpm (3800 L/min) at draft. The water supply source for the dry hydrant shall provide, on a year-round basis, the required quantity of water, as determined in Chapter 4 of this Standard. Dry hydrant systems shall be designed and constructed so that slope and piping configurations do not impede drafting capability. All exposed surfaces and all underground metal surfaces shall be protected to prevent deterioration. A minimum number of elbows shall be used in the piping system. Suction hose connection(s) shall be compatible with Fire Department's hard suction hose size and shall conform to NFPA 1963, *Standard for Fire Hose Connections*. The connection(s) shall include a protective cap. The cap and adapter shall be of materials that minimize rust and galvanic corrosion. Dry hydrant system piping shall be supported and/or stabilized using approved engineering design practices. Stabilization or equivalent protection shall be employed at elbows and other system stress points. In addition to strength of materials and structural support criteria, design shall specify appropriate aggregates and soil materials to be used to backfill/cover piping during installation. All connections shall be clean, and the appropriate sealing materials shall be used according to manufacturer's specifications so as to ensure that all joints are airtight. System strainers shall be constructed to permit required fire flow.

Dry Hydrant Locations. A minimum of 3 ft. (0.9144 m) shall be provided around the dry hydrant. Dry hydrants shall be located so that they are accessible under all weather conditions. The dry hydrant system and access to the site shall be developed in a manner that allows Fire Department pump to connect to the hydrant using not more than 20 ft. (6 m) of hard suction hose. Dry hydrants shall be located a minimum of 100 ft. (30 m) from any structure. No parking or other obstacles shall be allowed within 20 ft. (6 m) of the access side of the hydrant. Dry hydrants shall be protected from damage by vehicular and other perils, including freezing and damage from ice and other objects. Dry hydrant locations shall be made visible from the main roadway during emergencies by reflective marking and signage approved by the Fire Department. All identification signs shall be approved by the highway authority prior to installation if they are to be located on the right-of-way or are subject to state laws.

Depth of Water Sources. There shall be not less than 2 ft. (0.6 m) of water above the strainer and not less than 1 ft. (0.3 m) below the strainer. Depth of the water shall be based on the 50-year drought level for the water source.

Installation Procedure for Dry Hydrant System. The Fire Department shall ensure that the installation meets all design criteria.

Inspection and Maintenance of Dry Hydrants. Dry hydrants shall be inspected at least quarterly and maintained as necessary to keep them in good operating condition. Thorough surveys shall be conducted, to reveal any deterioration in the water supply situation in ponds, streams, or cisterns. Grass, brush, and other vegetation shall be kept trimmed and neat. Vegetation shall be cleared for a minimum 3 ft. (0.9 m) radius from around hydrants. The hydrants shall be marked, as needed, with reflective material to enhance their visibility during emergencies. Hydrant risers shall be protected from ultraviolet (UV) degradation by painting or other measures. The hydrants shall be flow tested at least annually with a Fire Department pump to ensure that the minimum design flow is maintained. **Records for Dry Hydrants.** The Fire Department shall maintain, in a safe location, maps and records of each dry hydrant installation and the subsequent tests, inspections, maintenance, and repairs to the dry hydrant. The International Wildland-Urban Interface Code may also be referenced.

UTILITIES

Careful consideration should be given to the location of all utilities to avoid interference with Fire Department access and operations. Meters, transformers, and piping should be carefully located and appropriately protected to avoid damage from ice, snow, and vehicles. All utility meters, shutoffs, or other equipment that would be attached to the exterior of a house shall be protected from falling ice and snow by a permanent shed roof section. Shutoffs need to be readily accessible.

WILDFIRE

Most of the District is considered the wildland-urban interface and is at risk for wildland fire hazards. Normal precautions of maintaining defensible space around buildings, irrigating grass, mowing, minimizing flammable vegetation, and storing combustibles away from buildings should be included in the planning process. Rated roofing material (A, B, C) should be used, as well as fire resistant building materials on exterior walls, which will minimize the spread of flames into the structure.