

GEORGETOWN LAKE FIRE SERVICE AREA FIRE PROTECTION STANDARDS

General

The GEORGETOWN LAKE FIRE SERVICE AREA (**GTLFSA**) Fire Protection Standards have been developed based on International, US, State, and County standards and requirements available for review and determined to be applicable to the **GTLFSA**. During review every attempt has been made to ensure that these standards are necessary and applicable to the **GTLFSA**. The documents, codes, standards, and guidelines referenced in this document have been determined to be the most current and valid versions as of June 1, 2017. These documents are routinely revised and updated so it is inferred that any reference to these documents and standards is a reference to the most recent valid version.

Scope

The Georgetown Lake Fire Service Area Fire Protection Standards provide the minimum planning, construction, and maintenance requirements for subdivisions to provide for the protection of life and property from emergency incidents.

Purpose

All subdivisions shall be planned, designed, constructed, and maintained to minimize the risk of fire and to ensure effective, efficient, and safe response to and mitigation of emergency incidents in order to protect persons, property, and natural resource areas. **GTLFSA** may allow or require a modification to these Standards if it believes that such modification would best serve the intended Purpose.

These standards have been developed to provide a variety of options to consider when developing the fire protection plan. Early review with the **GTLFSA** will ensure that the fire protection plan complies with these standards. **GTLFSA** may impose a particular option if they determine it best serves the intended purpose.

As a condition of final plat approval, the County must receive a letter from **GTLFSA** that verifies that the fire protection equipment and features have been accomplished and are in compliance with these standards.

Due to the fact that fire protection equipment and features required by these standards are necessary to ensure public safety, **GTLFSA** does not support the bonding of any items required by these regulations in order for the developer to obtain final plat approval. For health and safety reasons all elements of the fire protection plan shall be completed and all improvements installed prior to final plat approval.

Use

This document is intended to clarify and elaborate upon the areas in the *Requirements For Development Within the Wildland-Urban Interface* (RFDWWUI) (Appendix 2) which is adopted as a regulatory document by **GTLFSA**, and where the local agency having jurisdiction (**GTLFSA**) is granted the authority to act or exercise judgement in any capacity. This document is numbered to correspond with the sections of the RFDWWUI document, and should be read and interpreted in concert with such corresponding section(s).

Non-Residential and Multi-Family Developments

The standards contained in this document are to be used only for one and two family residential developments.

All Non-Residential and Multi-Family developments must comply with the current version of the International Fire Code, as adopted by the relevant County or the State of Montana.

Section I: Requirements for Subdivision Regulations

4. a. iv. and v. - Road Standards – Width and grade

- For roadways or driveways with dry hydrants located along them, see also: 5. b. ii. – *Drafting Sites and Dry Hydrants (Access)*.
- All fire access roads must be constructed to support the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

5. a. i. - Location of required water sources

- A hydrant for an approved water source that meets the 1,000 gpm for 30 minutes standard must be located within 1,000 feet of the center of the proposed building envelope.

- A hydrant from a water source approved under the reduced requirements of 5. b. vi. A. *Modifications*, must be located within 500 feet of the center of the building envelope.
- Distances from hydrants are to be measured as driven, on the center of an approved, all season road.
- Note that location restrictions for hydrants exist in multiple sections.
- Hydrants must conform with Supplement 2 -*Standards for Fire Hydrants in the **GTLFSA***.

5. b. ii. – Drafting Sites and Dry Hydrants

A. Design:

- For all non-pressurized systems the maximum water lift is 14 vertical feet, measured from a point 3 feet above the adjacent roadway or access area surface to the water level after the required volume of water has been removed. (2017 NFPA 1142 Annex B, 4.3).
- Note that due to allowances for sediment, drought, vortex, and freezing issues; ponds and natural water sources will likely need to contain much more water than other types of systems in order to meet requirements.
- Hydrant intakes for natural sources must be at least two feet above the lake bottom or streambed, six horizontal feet from where the pipe enters the water, and must be at least two feet below the minimum water and ice level; or otherwise certified by a licensed engineer to prevent pickup of sediment, or creation of a vortex, at required flow rates.
- An allowance for a 3 foot unusable ice layer shall be used in any calculations involving a lake or pond.
- See also: Supplement 1 - *Standards for Cisterns and Storage Tanks*, and Supplement 2 -*Standards for Fire Hydrants in the **GTLFSA***.

Location:

- A dry hydrant or its required access area may not be located within 100 feet of any combustible structure, unless another hydrant meeting

the standard in 5. a. i., is available within 1,000 feet of the structure, as driven, on the center of an approved, all season road.

- Spacing / distance is addressed in: *5. a. i. - Location of required water sources.*

Access:

- The roadway, driveway, or constructed area, adjacent to a dry hydrant and providing required access, shall, at a minimum, consist of at least a 75 foot length of all season roadway, at a consistent grade of 5% or less and a minimum width of 26 feet, exclusive of shoulders. A similarly constructed area that contains a turn around area of 120 feet in diameter is preferred.
- An approved turn-around provision must be incorporated within 500 feet of a required water source (hydrant).
- Parking shall be prohibited in a required access area or turn around provision.
- Rights of access and use shall be as required in Supplement 3 - *Rights of Access and Use*

5. b. iii – Pressurized hydrant systems

- A Community Public Water System as defined by MT DEQ, which is designed and operated per MT DEQ standards for supplying fire protection to that lot, is acceptable.
- A hydrant for a pressurized system shall not be located within a distance of twice the height of any combustible structure, unless there is another water source meeting the requirements of 5. a. i. within 1,000 feet, as driven, on the center of an approved, all season road.
- Spacing / distance is addressed in: *5. a. i. - Location of required water sources.*

5. b. iv. – Tanks and cisterns

Design:

- See Supplement 1 - *Standards for Cisterns and Storage Tanks*

Access

- See Supplement 3 - *Rights of Access and Use*

5. b. v. Testing and maintenance

- A.** Full flow testing shall be performed once annually and a detailed report of the flow test procedures and results shall be provided to **GTLFSA**. **GTLFSA** shall be notified of the scheduled testing and may elect to witness the test. **GTLFSA** may require testing be performed at a different time if it suspects that seasonal variations might be relevant to the results obtained.
- B.** Maintenance shall be as required in 7. b. ii. - *Maintenance of Equipment and Features*.

5. b. vi. A. – Modifications

This allowed reduction in fire flow demand is due to a lesser extent of exposure hazards to other structures in rural areas and not a need for less water. The understanding is that there may not be enough water to fight the fire at the structure but that the limited exposures in a rural setting can be protected.

Any lot served by a Community Public Water System as defined by MT DEQ, that is designed and operated per MT DEQ standards for supplying fire protection for that lot, is exempted from the stored water volume requirements contained below.

For a minor subdivision (a subdivision that creates five or fewer lots from a tract of record (76-3-103 (9) MCA)) of one and two family residential developments, the total required stored water volume for non-pressurized systems shall be calculated by one or both of the following methods:

1. If the structure(s) volume for any buildable lot(s) can be determined or reasonably estimated, by the method outlined in NFPA 1142 4.2.1 through 4.3.2., for those lots. Restrictive covenants shall be implemented to reflect the maximum building volume and construction type as used in the calculation.
2. If the structure(s) volume for any buildable lot(s) can not be determined or reasonably estimated, a value of 4,000 gallons per buildable lot shall be used for those lots. (2,800 sq./ft. x 10 equivalent).

It is not practical or efficient to use stored water systems of less than 10,000 gallons, therefore: The minimum size of any individual water storage source to be used to provide the required water volume calculated above is 10,000 useable gallons

While in most instances, the purpose of these standards will be best served by on-site water supplies, in certain cases, and upon approval by **GTLFSA**, an alternative to providing developed water sources on-site, may be to provide funding for **GTLFSA** apparatus and equipment.

In certain cases, and upon approval by **GTLFSA**, a combination of on-site water supplies and funding for **GTLFSA** apparatus and equipment may be a viable alternative.

Monetary Payment Calculation for Offsite Water Development:

The monetary payment is calculated at \$1.00/gallon as of January 1, 2017. (The cost per gallon will be time adjusted to inflation using the US Dept. of Labor Bureau of Labor Statistics CPI Inflation Calculator).

If the developer proposes this alternative, some possible reasons for approving this alternative could be:

- Topography which will not allow development, installation, or required access to an on-site supply.
- Smaller developments.
- Proximity of adequate existing and developed water resources
- A preference for single resources of 30,000 gallons useable capacity, and not less than 10,000 gallons useable capacity.

5. b. vi. C. – Modifications

- To the extent possible, stored water systems must consist of 30,000 useable gallon sources dispersed to optimize delivery to the intended building envelopes.

7. b. ii. - Maintenance of Equipment and Features

- Provisions shall be incorporated in the plat documents describing how required fire protection equipment and features are to be maintained currently and in the future, by whom, and how **GTLFSA** can be assured that the required fire protection equipment and features will continue to function appropriately. The **GTLFSA** will not be responsible for any maintenance, electricity, or any other costs associated with enhancements, upgrades or other measures necessary to assure the required fire protection equipment and features continue to function to original specifications.
- The maintenance and associated costs of required fire protection equipment and features shall be assumed by the sub-divider/developer/owner unless and until such time as a homeowner's association assumes responsibilities.

Section II: Requirements for Zoning Regulations

3. a. iii. and iv. - Road Standards – Width and grade

- For roadways or driveways with dry hydrants located along them, see also: Section 1 - 5. b. ii. – *Drafting Sites and Dry Hydrants (Access)*.
- All fire access roads must be constructed to support the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

5. b. ii. - *Maintenance of Equipment and Features*

- Provisions shall be incorporated in the plat documents describing how required fire protection equipment and features are to be maintained currently and in the future, by whom, and how **GTLFSA** can be assured that the required fire protection equipment and features will continue to function appropriately. The **GTLFSA** will not be responsible for any maintenance, electricity, or any other costs associated with enhancements, upgrades or other measures necessary to assure the required fire protection equipment and features continue to function to original specifications.
- The maintenance and associated costs of required fire protection equipment and features shall be assumed by the sub-divider/developer/owner unless and until such time as a homeowner's association assumes responsibilities.

Supplement 1

Standards for Storage Tanks and Cisterns in the GTLFSA

- A. Tanks, cisterns, and related equipment, shall be certified by a licensed engineer as suitable for the intended purpose and installation, and as providing required flows and/or volumes.
- B. Prior to final review, the following documents are required to be provided to the **GTLFSA**: A copy of the engineer's certification and any other relevant engineer's statements relating to the installation. If a commercially produced system is used, a copy of the operation manual, and a copy of the installation instructions.
- C. All components shall be designed to provide 1,000 gpm flow for the required volume.
- D. All components shall be of a design and/or material that will not cause the water to be contaminated by particulate matter, products of decay or corrosion, or other contaminants that may be harmful to fire equipment.
- E. All openings shall be sealed or screened when the tank is not being accessed, for public safety, and to prevent the entry of contaminants.
- F. An access/inspection cover shall be provided that allows ready personnel access upon removal of a padlock. Cover shall be at least 12 inches above the surrounding grade, not more than 40lbs in weight, and designed such that it cannot fall into tank during removal.
- G. At least two feet of water must remain above the end of the suction intake after the required volume has been removed from the tank, or the tank must be engineered to prevent vortex formation at the required flow with a lower water level. Vortex breakers are commercially available that may be helpful in reducing tank size while still providing the required flow rate and usable capacity.
- H. Suction intake for hydrant must be located at least 12 inches from bottom of tank unless an alternate design is certified by the engineer to provide the required flow, or if otherwise specified for a commercially manufactured inlet or vortex breaker.

- I. A filling provision must be provided for tanks and cisterns. Fill connection must have two 2½ inch female National Standard Hose thread connections with covers, installed to provide a horizontal connector, 36 to 48 inches above the surrounding surface. Filler pipe shall be not less than 4 inches ID, or not less than 2½ inches ID, if two pipes are used. If separate filler pipes are not used, the inlets shall be clapped. The discharge end of filler pipe(s) shall not be located within 6 horizontal feet of suction pipe, and/or shall be designed to prevent aeration of suction inlet when used. Filler pipes shall be adequately braced, or of such construction that they will not be damaged by hose strain.
- J. A separate air vent shall be provided, and shall be 6" ID, or shall be certified adequate for outflow or inflow of 1,000 gpm. Vent opening shall be screened, not sealed.
- K. Tanks and cisterns shall have an automatic self-supplying fill feature.
- L. Buried tanks and cisterns that are not designed for fire equipment loads shall be installed or barricaded such that fire vehicle travel over the tank is not possible. Required access area dimensions must be maintained.
- M. All non-pressurized water sources shall be treated as containing non-potable water.
- N. As a reminder, an approved hydrant, per Supplement 2 - *Standards for Fire Hydrants in the **GTLFSA***, is required to be provided.
- O. As a reminder, per 5. b. vi. A. – *Modifications*, the minimum size for a tank or cistern is 10,000 usable gallons.

Supplement 2

Standards for Fire Hydrants in the GTLFSA

All Fire Hydrants

- A. A minimum of three feet of clear, unobstructed space, shall be provided around a hydrant.
- B. Hydrants shall be installed within 10 feet of the adjacent roadway or access area surface.
- C. Hydrants shall be readily and safely accessible from the all-season road or all-season access area, and shall not be at risk from near-by structures, steep slopes, chimneys, or other hazards. An approved draft support for a dry hydrant is not considered an obstruction.
- D. All hydrant connections shall be provided with protective caps. Caps and valves must have either a pentagon nut, or rocker lug feature, that is compatible with standard hydrant wrenches.
- E. Hydrants shall be protected from damage from vehicles and snow removal equipment, and shall be marked and snow-staked as approved by the **GTLSA**.

Pressurized Fire Hydrants

- A. A pressurized hydrant system must be designed to deliver the required minimum flow at 20 psi residual pressure, for the required time period.
- B. Hydrant installations conforming with MT DEQ *Standards for Water Works* are acceptable.
- C. Hydrants shall have a bottom valve size of at least five inches, one 4.5 inch pumper nozzle and two 2.5 inch nozzles. Nozzle thread shall be National Hose male.
- D. Hydrant pumper nozzle must face a fire pumper intake when parked in the provided access area, or adjacent roadway.
- E. Hydrants shall be installed such that the top operating nut is 48 to 60 inches above the surrounding surface.

- F.** Hydrant drains shall be above the seasonal high ground water table. A gravel pocket or dry well must be provided unless the natural soils will provide adequate drainage. If hydrant drains cannot be located above the seasonal high ground water table, hydrants with plugged drains may be allowed, with explicit approval of the **GTLFSA**. Freeze protection must be maintained.
- G.** Shall be “Fire Hydrant Red” in color.
- H.** Per 5. b. iii, a hydrant for a pressurized system shall not be located within a distance of twice the height of any combustible structure, unless there is another water source meeting the requirements of 5. a. i. within 1,000 feet, as driven, on the center of an approved, all season road.

Non-Pressurized (Dry) Fire Hydrants

- A.** A dry hydrant uses the drafting capability of fire equipment to access water that is not pressurized, or is not adequately pressurized to provide the required flow at 20 psi residual pressure.
- B.** Hydrants, and all system components, shall be designed and constructed to provide a minimum of flow of 1,000 gpm for a fire pumper at draft, at the installed elevation.
- C.** Hydrants shall be installed so that the center of the threaded connector is 28 to 30 inches above the adjacent roadway or access area surface.
- D.** A hydrant shall have a single 6” NH male connection with removable screen and cover. The connection must face a fire pumper intake when parked in the provided access area.
- E.** Piping shall be not more than 30 feet in length, a minimum of 6 inches ID, with a maximum total of 200 degrees of elbows and bends used; unless an alternate design is certified by a licensed engineer to provide the required flow.
- F.** At a minimum, Schedule 40 pipe and components shall be used. If PVC piping is used, extra care must be used with it with regard to stabilization and protection from stresses or impacts such as pushed snow, ground movement, or vehicle impact.

- G.** System piping shall be supported and/or stabilized using approved engineering design practices. Particular attention shall be given to elbows, and other stress points, such as the pumper connection.
- H.** Adequate freeze protection, as certified by a licensed engineer, shall be provided.
- I.** Piping shall be sloped downward toward the source water, so as to prevent trapped air when drafting. Any size reducers shall be of the eccentric type, oriented to prevent trapped air in the piping.
- J.** Appropriate sealing materials must be used to ensure that all joints remain airtight.
- K.** All exposed surfaces, and all underground metal surfaces shall be protected to prevent deterioration.
- L.** Except for tank/cistern installations, a commercially produced intake screen with a self closing, hinged end cover shall be used; unless an engineer certified design that allows for effective back flushing is used.
- M.** If system design is such that a hydrant type that normally would be used with a pressurized system would be required to overcome static pressure or static water level (freezing) issues, explicit approval from the **GTLFSA** is required, as the hydrant drains will need to be sealed. The hydrant manufacturer should be consulted to assure that the particular hydrant used will have adequate sealing under vacuum conditions, or the system may fail testing.
- N.** Per 5. b. ii, hydrant intakes for natural sources must be at least two feet above the lake bottom or streambed, six horizontal feet from where the pipe enters the water, and must be at least two feet below the minimum water and ice level, or otherwise certified by a licensed engineer to prevent pickup of sediment, or vortex creation, at required flow rates.
- O.** Per 5. b. ii, for all non-pressurized systems the maximum water lift is 14 vertical feet, measured from a point 3 feet above the adjacent roadway or access area surface to the water level after the required volume has been removed.
- P.** Per 5. b. ii, a dry hydrant or it's required access area may not be located within 100 feet of any combustible structure, unless another

hydrant meeting the standard in 5. a. i., is available within 1,000 feet of the structure, as driven, on the center of an approved, all season road.

- Q.** A draft hose support structure may be provided to help protect from vehicles and pushed snow, minimize the strain on the exposed pipe during cold weather, and to help facilitate connection of the suction hose with minimal manpower. The draft hose support structure should be located directly in front of the hydrant, 3 feet from the pumper connection, and the top of the support should be the same height as the bottom of the connection to allow for the draft hose to be in a horizontal position. A partially buried, flat topped boulder may be an aesthetically pleasing execution. If a draft hose support is used, required access area dimensions must be maintained.

Supplement 3

Rights of Access and Use

A perpetual easement for unrestricted access to, inspection and testing of, and use by; **GTLFSA** or any successor fire protection or water service agency, and their co-operators; of a required water supply system; shall be recorded and noted on the plat documents.

GTLFSA may require that access be available to fire protection systems using a **GTLFSA** designated key or equivalent.

Whenever the **GTLFSA** takes water from a system, that was not from a natural, self-replenishing source, for use in an incident that does not threaten the property of the system owner(s); the **GTLFSA** shall either replace the water taken with non-potable water, or, the **GTLFSA** shall estimate the net quantity of water taken based on the capacity of the emergency apparatus used. The **GTLFSA** shall make a reasonable effort to contact the system owner and offer to compensate the owner for the estimated net water taken, at the rate in effect for residential potable water above the base rate, in the City of Anaconda. Testing of the system shall not require compensation for water used.

Damage to a water system discovered during use or testing, or caused by a reasonable effort to access the system and obtain the designed water flow, is not responsibility of the **GTLFSA**.

Appendix 1

List of Source Publications

Appendix 2

“REQUIREMENTS FOR DEVELOPMENT WITHIN THE WILDLAND-URBAN INTERFACE” adopted from the State document “GUIDELINES FOR DEVELOPMENT WITHIN THE WILDLAND-URBAN INTERFACE September 24, 2009”.

APPENDIX 1

List of Source Publications

Guidelines for Development within the Wildland-Urban Interface
(September 24, 2009)

NFPA 1142 (2017 edition)

International Fire Code 2012 as adopted by the State of Montana
(Rule: 23.12.601)

CWPP Granite County (November 2005)

CWPP Anaconda-Deer Lodge County (September 2005)

MT DEQ Standards for Water Works (August 8, 2014 Edition)