

Fire Hydrant Requirements

2025 California Fire Code — Section 507 & Appendix C

Purpose. This handout summarizes commonly applicable requirements for fire hydrant water supply, location, number, spacing, installation, clearance, protection, testing, and maintenance. Private fire service mains and appurtenances are installed in accordance with NFPA 24 as amended by the 2025 California Fire Code.

KEY REQUIREMENT	BASE 2025 CFC REQUIREMENT
Required water supply	Approved water supply capable of supplying the required fire flow.
General hydrant-distance trigger	On-site hydrants/mains may be required when any portion of a new or relocated facility/building is more than 400 ft from a hydrant along an approved fire-apparatus access route.
Sprinklered R-3 / U exception	The Section 507.5.1 distance may increase to 600 ft when the qualifying occupancy is sprinklered throughout as specified by the CFC.
Standpipe FDC	A hydrant must be within 100 ft of the fire department connection, unless a greater distance is approved.
Clearance	Maintain 3 ft of clear space around the entire circumference of the hydrant.
Private hydrant ITM	Inspect annually and after each operation; flow test and maintain annually.

1. Required Water Supply & Fire Flow

An approved water supply capable of supplying the required fire flow must be provided for premises where facilities, buildings, or portions of buildings are newly constructed or moved into the jurisdiction. Acceptable fixed water-supply types can include water mains, reservoirs, pressure tanks, elevated tanks, or other fixed systems capable of providing the required fire flow.

Fire flow is determined by an approved method or CFC Appendix B. Appendix B defines fire flow as the water-supply flow rate available for firefighting at 20 psi residual pressure. The required flow and duration depend on building size, construction type, occupancy, and qualifying sprinkler protection.

Where adequate and reliable water-supply systems do not exist in rural or suburban areas, Appendix B permits the fire code official to use NFPA 1142 or the California Wildland-Urban Interface Code when applicable.

Code references: 2025 CFC §§507.1–507.3; Appendix B §§B102.1, B103.3, B105.

2. When On-Site Fire Hydrants Are Required

For a facility or building newly constructed or moved into or within the jurisdiction, on-site fire hydrants and mains are required where directed by the fire code official when a portion of the facility or building is more than 400 feet from a hydrant located on a fire apparatus access road. The distance is measured along an approved route around the exterior.

- Group R-3 and Group U occupancies sprinklered throughout in accordance with the sprinkler standards listed in CFC §507.5.1 may use a distance of up to 600 feet.
- Buildings equipped with a standpipe system under CFC §905 must have a fire hydrant within 100 feet of the fire department connection, unless a greater distance is approved by the fire code official.
- The base CFC does not establish one universal hydrant-to-FDC distance for every sprinkler-only FDC. CFC §912.2 instead requires the FDC location to be approved and arranged with respect to hydrants, driveways, buildings, and landscaping so fire apparatus and hose do not obstruct other apparatus access.

Code references: 2025 CFC §§507.5.1, 507.5.1.1 and 912.2.

3. Number & Spacing of Fire Hydrants

CFC §507.5 requires hydrant systems to comply with §§507.5.1 through 507.5.6 and Appendix C, or an approved method. Appendix C determines the minimum number and distribution of hydrants based on the required fire flow.

FIRE FLOW (gpm)	MIN. HYDRANTS	AVG. SPACING (ft)	MAX. FRONTAGE DISTANCE TO HYDRANT (ft)
1,750 or less	1	500	250
1,751–2,250	2	450	225
2,251–2,750	3	450	225
2,751–3,250	3	400	225
3,251–4,000	4	350	210
4,001–5,000	5	300	180
5,001–5,500	6	300	180
5,501–6,000	6	250	150
6,001–7,000	7	250	150
7,001 or more	8 or more*	200	120

* For fire flows above 7,000 gpm, Appendix C requires one hydrant for each 1,000 gpm or fraction thereof.

Appendix C also contains the following distribution adjustments and conditions:

- Reduce average hydrant spacing by 100 feet on dead-end streets or roads.
- Reduce the maximum frontage distance to a hydrant by 50 feet on dead-end streets or roads.
- Where median dividers cannot be crossed by firefighters pulling hose lines, or certain high-volume arterial streets have four or more traffic lanes, hydrants are arranged on both sides on an alternating basis as specified by Appendix C.
- Where new water mains are extended along streets where hydrants are not needed for structure protection, Appendix C permits hydrants at spacing not exceeding 1,000 feet for transportation hazards.
- A 50% spacing increase is permitted for buildings sprinklered throughout under CFC §903.3.1.1; a 25% spacing increase is permitted for qualifying systems under §§903.3.1.2 or 903.3.1.3, or CRC §P2904.
- The fire code official may modify hydrant location, number, and distribution based on site-specific constraints and hazards.

Existing hydrants on public streets may be counted toward Appendix C requirements. Existing hydrants on adjacent properties may also be considered where a fire apparatus access road extends between the properties and an easement prevents obstruction of that access.

Code references: 2025 CFC §507.5; Appendix C §§C101–C104 and Table C102.1.

4. Private Fire Hydrant Installation

Private fire service mains and their appurtenances must be installed in accordance with NFPA 24 as amended by Chapter 80 of the 2025 California Fire Code. The specific hydrant manufacturer/model, outlet configuration, operating nut, thread type, color coding, valve arrangement, backflow protection, and water-purveyor requirements must match the approved plans and the requirements of the approving authorities.

The 2025 edition of NFPA 24 is the installation standard referenced by California jurisdictions for private fire service mains and hydrant appurtenances. NFPA 24 addresses water supplies, supply connections, hydrants, underground requirements, hydraulic calculations, valves, restraint, inspection, testing, and maintenance.

Common design and plan-review items for a private hydrant system include:

- Required fire flow and hydraulic calculations demonstrating the available flow and pressure.
- Point of connection to the public or private water source.
- Private fire service main size, material, routing, depth, fittings, and method of restraint.
- Hydrant locations and the size/number of hose outlets.
- Control valves, valve indicators, backflow devices, meters, regulators, and associated appurtenances.
- Fire department connection location and piping arrangement where applicable.
- Underground trench, restraint/thrust, flushing, pressure-test, and inspection details.
- Compatibility with the local water purveyor and approved fire-department hose/operating requirements.

NFPA 24 requires hydraulic design adequate to supply the system demand. Private fire service mains that supply fire hydrants are generally not less than 6 inches nominal in size; a larger main may be necessary when required by hydraulic calculations, the water purveyor, or the approved design.

Code references: 2025 CFC §507.2.1 and Chapter 80; NFPA 24 (2025 edition), including Chapters 4–7 and 10–14.

5. Hydrant Location & Fire Apparatus Use

Hydrants must be located so firefighters can reach and operate them immediately. Required hydrants are coordinated with fire apparatus access roads and the Appendix C distribution requirements.

- Hydrant access must not be blocked by parking, fencing, landscaping, storage, equipment, or other objects.
- When coordinating a hydrant with an FDC, the layout should allow apparatus and hose supplying the system to operate without blocking access needed by other fire apparatus.
- For standpipe systems, the 100-foot hydrant-to-FDC requirement in CFC §507.5.1.1 applies unless the fire code official approves a greater distance.
- Hydrants subject to damage from vehicles require guard posts or another approved means of protection complying with CFC §312.

Code references: 2025 CFC §§507.5.1.1, 507.5.4–507.5.6, 912.2 and 312.

6. Required Clearance Around Fire Hydrants

A clear space of at least 3 feet must be maintained around the entire circumference of each fire hydrant, unless another clearance is specifically required or approved. The clearance is an operating space for firefighters and must remain available at all times.

The 3-foot clear space should be kept free of:

- Shrubs, trees, vines, weeds, and other vegetation
- Fences, walls, gates, posts, and decorative features
- Trash or recycling containers
- Storage, pallets, merchandise, or equipment
- Parked vehicles or trailers
- Snow, soil, rock, mulch piles, or other accumulated material
- Any object that delays immediate hose connection or hydrant operation

The CFC separately requires unobstructed access to hydrants at all times; therefore, an obstruction can be a violation even when it is outside the 3-foot circumference if it prevents or delays immediate access.

Code references: 2025 CFC §§507.5.4 and 507.5.5.

7. Vehicle-Impact Protection

Where a hydrant is exposed to vehicle impact, it must be protected by guard posts or another approved means in accordance with CFC §312. The method and placement must protect the hydrant without preventing firefighters from operating it or violating the required hydrant clearance.

Do not assume that one curb height, bollard diameter, or bollard spacing is universally required for every hydrant. The applicable Section 312 design, site conditions, approved plans, and local installation standards determine the required protection.

Code references: 2025 CFC §§507.5.6 and 312.

8. Water-Supply & Acceptance Testing

The fire code official must be notified before a required water-supply test. The test must be witnessed by the fire code official or approved documentation must be provided before final approval of the water-supply system.

Private underground fire service systems also require the acceptance inspections and tests prescribed by NFPA 24 and the approved plans. Depending on the system, these commonly include visual inspection before concealment, hydrostatic pressure testing, flushing, and final verification of hydrant operation and available flow.

New hydrants should not be placed in service as an assumed fire-protection water source until the required installation inspection and acceptance testing have been completed and approved.

Code references: 2025 CFC §507.4; NFPA 24 (2025 edition).

9. Inspection, Testing & Maintenance of Private Hydrants

Private fire service mains and water tanks are subject to California Code of Regulations, Title 19, Division 1, Chapter 5. The 2025 CFC summarizes the following minimum frequencies:

ITEM	INSPECTION	TEST / MAINTENANCE
Private fire hydrants — all types	Annually and after each operation	Flow test and maintenance annually
Fire service main — exposed piping	Annually	Flow test of fire service main every 5 years
Fire service main strainers	After each use	Maintenance after each use

Hydrant systems must remain operative at all times and defective equipment must be repaired. Records of required tests and maintenance must be maintained.

Under Title 19, inspections may be performed by a competent owner/occupant employee; businesses performing inspections for a fee require the applicable State Fire Marshal or C-16 licensing. Required testing and maintenance of automatic fire extinguishing systems must be performed by appropriately licensed persons or entities, subject to the specific Title 19 exceptions.

Code references: 2025 CFC §§507.5.2–507.5.3; CCR Title 19, Div. 1, Ch. 5, §§904–905.

10. Public vs. Private Fire Hydrants

Public hydrants are generally part of a public water utility or water-purveyor system. Private hydrants are located on and maintained as part of a private fire-protection water system. The CFC allows existing public hydrants to be counted for Appendix C distribution when they are available to the building.

A hydrant located physically on private property is not automatically a private hydrant; a public water utility may own and maintain hydrants located within a utility easement. Ownership, testing responsibility, and repair authority should be confirmed before work is performed.

Code references: 2025 CFC Appendix C §C104; CFC §507.5.3 for private fire service mains.

11. Fire Hydrant Installation & Inspection Checklist

- ☐ Required fire flow and duration have been established using an approved method / Appendix B.
- ☐ Water-supply information or hydraulic calculations demonstrate adequate available flow and pressure.
- ☐ Hydrant number and spacing comply with CFC §507.5 and Appendix C or an approved method.
- ☐ Every required hydrant is on or accessible from the approved fire-apparatus access route.
- ☐ Standpipe-system FDC has a hydrant within 100 ft unless a greater distance is approved.
- ☐ Private fire service mains and appurtenances are designed and installed to NFPA 24 as amended by Chapter 80.
- ☐ Hydrant, valves, outlets, threads, orientation, piping, backflow equipment, and restraint match approved plans.
- ☐ Required underground inspections occur before piping, joints, and restraints are concealed.

- ☐ Required hydrostatic, flushing, water-supply, and acceptance tests are completed and approved.
- ☐ At least 3 ft of clear operating space is maintained around the full hydrant circumference.
- ☐ Hydrant remains visible and immediately accessible; parking, fencing, landscaping, and storage do not interfere.
- ☐ Vehicle-impact protection is installed where required without obstructing hydrant operation.
- ☐ Private hydrant annual inspection, annual flow test/maintenance, and post-operation inspection are current.
- ☐ Fire-service-main exposed-piping inspection and 5-year flow-test records are current.

Applicable Code References

- 2025 California Fire Code, Title 24, Part 9 with January 2026 Errata — §§507.1–507.5.6 and 912.2
- 2025 California Fire Code — Appendix B, Fire-Flow Requirements for Buildings
- 2025 California Fire Code — Appendix C, Fire Hydrant Locations and Distribution
- 2025 California Fire Code — Chapter 80, Referenced Standards
- NFPA 24 (2025 edition) — Standard for the Installation of Private Fire Service Mains and Their Appurtenances
- California Code of Regulations, Title 19, Division 1, Chapter 5 — Automatic Fire Extinguishing Systems

This handout summarizes commonly applicable requirements for public information. The adopted code, referenced standards, approved plans, water-purveyor requirements, local amendments, and determinations of the fire code official govern where a conflict or project-specific condition exists.