

**Barstow Fire Protection District**  
 Barstow, California  
 Occupancy Load & Means of Egress - Standard

**Occupant Load:**

The occupant load, in number of persons for whom means of egress and other provisions are required, shall be determined on the basis of the occupant load factors of Table 1004.1.2 of the California Fire Code, 2016 Edition, that are characteristic of the use of the space or shall be determined as the maximum probable population of the space under consideration, whichever is greater.

**Means of Egress Requirements:**

Assembly occupancies with occupant loads of 600 or fewer shall have two separate means of egress. Assembly occupancies with occupant loads greater than 600 but fewer than 1000 shall have three separate means of egress. Access and egress routes shall be maintained so that any individual is able to move without undue hindrance, on personal initiative and at any time, from an occupied position to the exits. Access and egress routes shall be maintained so that crowd management, security, and emergency medical personnel are able to reach any individual at any time, without undue hindrance. In every occupied building or structure, means of egress from all parts of the building shall be maintained free and unobstructed. No lock or fastening shall be permitted that prevents free escape from the inside of any building. Means of egress shall be illuminated in accordance with the code. Emergency lighting shall also be provided. Means of egress shall be provided with signs. The building owner or agent shall inspect all means of egress in assembly occupancies identified as bars, dance halls, discotheques, nightclubs or where festival seating is used, to ensure all means of egress are maintained free of obstructions, and correct any deficiencies found, prior to each opening of the building to the public. A record, available to the AHJ, shall be kept of all inspections, deficiencies found, and actions taken to correct them.

**Detection, Alarm, and Communications Systems:**

Assembly occupancies with occupant loads of more than 300 and all theaters with more than one audience-viewing room shall be provided with an approved fire alarm system.

**Ignition sources:**

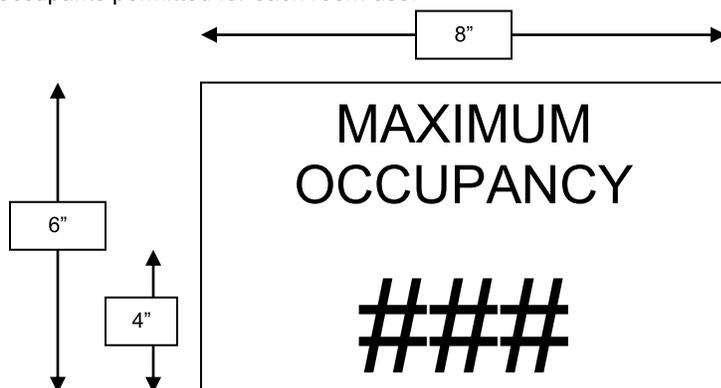
No open flame devices or pyrotechnic devices shall be used in any assembly occupancy, unless otherwise permitted.

**On-site fire protection:**

Any assembly occupancy used or capable of being used for exhibition or display purposes shall be protected throughout by an approved automatic sprinkler system where the exhibition or display area exceeds 5,000 sq ft. Buildings containing assembly occupancies with occupant loads of more than 300 shall be protected by an approved, supervised automatic sprinkler system in accordance with the Code. or a assembly occupancy where the occupant load exceeds 100, identified as bars, dance halls, discotheques, nightclubs or where festival seating is used, shall be protected throughout by an approved, supervised, automatic fire sprinkler system.

**Occupant Load Posting:**

Every room constituting an assembly occupancy and not having fixed seats shall have the occupant load of the room posted in a conspicuous place near the main exit from the room. Approved signs shall be maintained in a legible manner by the owner or authorized agent. Signs shall be durable and shall indicate the number of occupants permitted for each room use.



Barstow Fire Protection District	Standard #	BAR 1	Standard <b>BAR1</b>
861 Barstow Road	Description:	Assembly Areas	
Barstow, California 92311			
(760) 256-2254	Revised:	12/2016	

**Barstow Fire Protection District**

Barstow, California  
Emergency Plans - Standard

**Application.** An emergency action plan when required MUST be available to all residents.

**Written and oral emergency action plans.** An emergency action plan must be in writing, kept in the leasing office or in a place approved by the Fire District and available to residents for review. However, a residential community with 10 or fewer employees may communicate the plan orally to employees.

**Minimum elements of an emergency action plan.** An emergency action plan must include at a minimum:

Procedures for reporting a fire or other emergency;

Procedures for emergency evacuation, including type of evacuation and exit route assignments;

Procedures to be followed by employees of the community who remain to operate critical plant operations before they evacuate;

Procedures to account for residents after evacuation;

The name or job title of every employee who may be contacted by employees who need more information about the plan or an explanation of their duties under the plan.

**Alarm systems.** When a residential community has and maintains an employee alarm system. The employee alarm system must use a distinctive signal for each purpose and comply with the requirements in Title 24, California Code, section § 2410.165.

**Training.** The property owner or agent will designate and train employees to assist in a safe and orderly evacuation of residents. **California Health and Safety Code: 1910.38(f).**

**Review of emergency action plan.** The property owner or agent will review the emergency action plan with each resident covered by the plan and provide a copy of the emergency plan to each household and supply any changes or alterations of the plan to each household.

Barstow Fire Protection District	Standard #	BAR2	Standard <b>BAR2</b>
861 Barstow Road	Description:	Emergency Action Plan Standard	
Barstow, California 92311	Revised:	01/2014	
(760) 256-2254			

**Barstow Fire Protection District**

Barstow, California  
 Fire Department Access - Standard

**WHERE REQUIRED:**

Fire apparatus access roads shall be provided to within 150 feet of all exterior portions of the first story of every building, as measured by an approved route around the exterior of the building.

Access roads extending beyond this point shall meet minimum Fire Department Access Road requirements, including width, distance, turnarounds and height limitations (Ref: California Fire Code, 2016 Edition, Chapter 5).

Exception: Roads that are identified as “lanes” in the City of Barstow Street.

**WIDTH:**

Fire apparatus roads shall be provided as follows:

Roads serving buildings three (3) stories or less in height - Access roads must be a minimum of 26 feet in width. This road width provides the required access needed to accommodate operating fire apparatus and room for emergency exiting of private vehicles.

Roads serving buildings four (4) or more stories, or in excess of 45 feet in height:

Access roads must be a minimum of 36 feet in width. This road width provides the required access needed to accommodate aerial apparatus required for structures of this height and room for emergency exiting of private vehicles. The street width of 36 feet is without parking on either side of the access roadway. To accommodate street-side parking, and additional 8 feet of width must be provided on the side with parking.

The width may be reduced by the Fire Marshal if he or she is satisfied with the 26' access.

**GATES:**

Gates proposed on Fire Department Access Roads shall be reviewed and approved by the Fire Department prior to a permit being issued. Approved gates shall comply with the following:

- a. A powered gate with controller, activated from a key box override provided for all gates on roads that serve residential and commercial properties. Gates on roads that serve areas and buildings that are not normally occupied, such as service roads leading to utility buildings, may be locked using an approved Fire Department lock.
- b. Gates shall be placed with a minimum set back distance of 20 feet from the beginning of the roadway controlled by the gate.
- c. For exiting only, the powered gate may be activated by means of an approved magnetic loop detector, installed in accordance with applicable Design Standards.
- d. In the event of a power failure, all powered gates shall unlock and release to manual opening, without the use of any special device, key or tools and may be protected by an approved locking cover or device.

**SECONDARY ACCESS:**

A secondary means of emergency vehicle access is required when the road serves in residential units, or exceeds 150 feet in length or when, in the opinion of the Fire Chief, access by a single road might be impaired or unsafe due to vehicle congestion, condition of terrain, climatic conditions, very high fire hazard severity zones or other such local conditions

**VERTICAL CLEARANCE:**

Minimum unobstructed vertical clearance of all Fire Department Access Roads shall be a minimum of 14 feet 6 inches.

**SURFACE:**

Fire Department Access Roads shall be designed to support the imposed loads of fire apparatus, shall be paved, and shall meet City Street Design Standards.

**STREET / DRIVE LENGTH:**

Dead-end streets exceeding 150 feet in length shall be provided with an approved cul-de-sac. Public streets exceeding 500 feet in length shall have two dedicated fire access points. Emergency Vehicle Access (EVA) points are not permitted as a second point of access.

Barstow Fire Protection District	Standard #	BAR 3	Standard <b>BAR3</b>
861 Barstow Road	Description:	FIRE DEPARTMENT ACCESS	
Barstow, California 92311			
(760) 256-2254	Revised:	12/2016	

**Barstow Fire Protection District**

Barstow, California

Fire Department Access - Standard

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**Private Roads and Drives:**

Dead-end streets and drives exceeding 150 feet in length and serving less than 25 units shall provide an approved cul-de-sac with a minimum radius of 45 feet. Dead-end streets and drives exceeding 500 feet in length or providing access to more than 50 units shall have two dedicated fire access points. Emergency Vehicle Access (EVA) points are not permitted as a second point of access.

**TURNING RADIUS:**

Inside radius shall be a minimum of 20 feet; outside radius shall be a minimum of 40 feet, and shall meet approval of the Fire Department. Turning radius shall be identified on submitted site plans for Fire Department review and approval.

**GRADE:**

The maximum grade of a Fire Apparatus Road shall not exceed 15 percent (Street Design Standard).

**TURNAROUNDS:**

Turnarounds shall meet Fire Department standards (Street Design Standard). Cul-de-sacs shall meet City Street Design Standards with a minimum of 45 foot radius (Street Design Standards).

**OBSTRUCTION:**

The required width of any fire apparatus access road shall not be obstructed in any manner, including but not limited to, parking of vehicles, placement of dumpsters, stacking of building materials or other items. Where required, approved signs or other notices prohibiting parking or obstructions shall be provided and maintained by the property owner.

**BRIDGES:**

Bridges shall be constructed and maintained in accordance with nationally recognized standards. Bridges shall be designed for a live load sufficient to carry the imposed loads of fire apparatus.

**TURNOUTS:**

Where driveways are in excess of 500 feet, emergency turnouts may be required as dictated by site-specific conditions.

**FIRE LANE MARKING:**

Curb top and side shall be painted red, and the words, "FIRE LANE" shall be stenciled on the top and side of all red curbs at a maximum interval of 50 feet. Letters shall be three inches (3") in height with a minimum 3/4-inch in stroke.

Alternatively, if the roadway has no curbing, a 12-inch wide red stripe with the words "FIRE LANE" in white may be painted along and parallel with the edge of the roadway. The lettering shall be 8-inches high with a 3/4-inch stroke.

**Signage:**

1. Signs shall be of metal construction, measuring 12-inches wide and 18-inches high, and of a reflective type. Plastic or wooden signs are not acceptable.
2. Signs shall read: "NO STOPPING - FIRE LANE 22500.1 CVC." Lettering shall be not less than one-inch in height and clearly visible from a vehicle.
3. Signs shall be in visible locations and mounted on galvanized metal poles at a height of 80 inches. Signs shall be maintained unobstructed by foliage, etc.
4. The distance between signs posted along the fire lane shall not exceed 125 feet. Not less than two signs shall be posted in each block. If traffic flows in two directions, signs must be posted so as to be readable from either direction.

Barstow Fire Protection District	Standard #	BAR 3	Standard <b>BAR3</b>
861 Barstow Road	Description:	FIRE DEPARTMENT ACCESS	
Barstow, California 92311			
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**Roadway Surface Marking:**

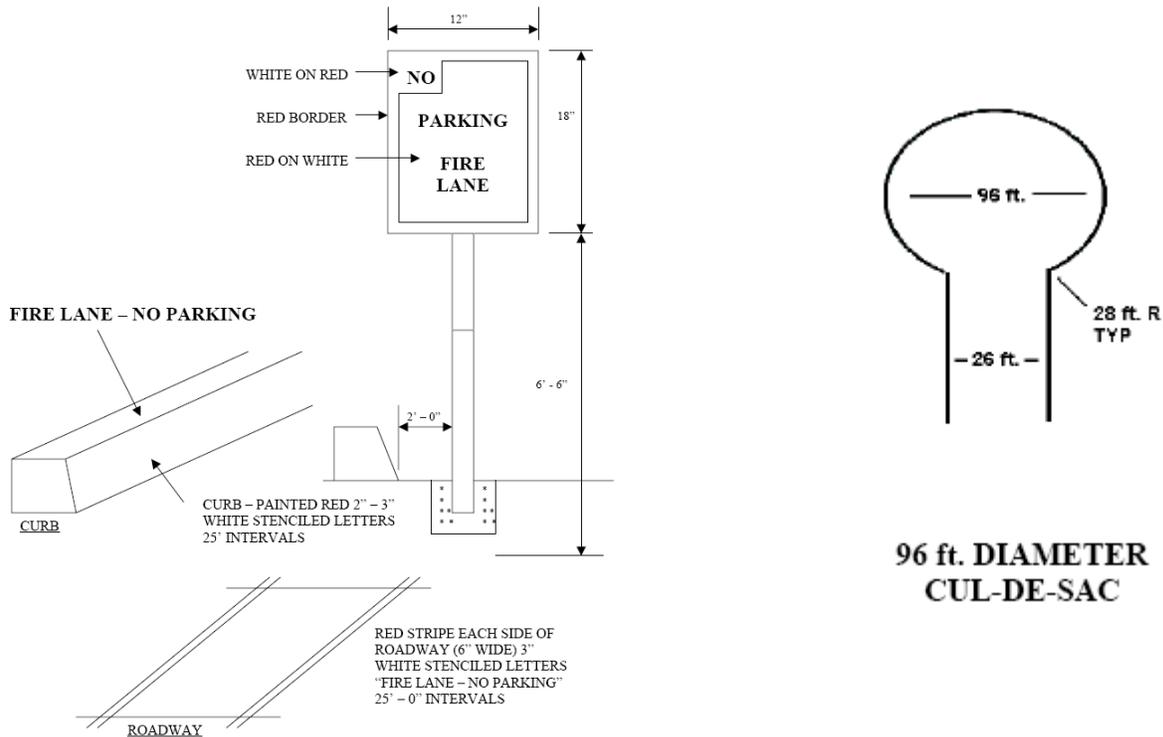
Outlining or painting the fire lane area in red with the words "FIRE LANE" in white, at intervals of not more than 50 feet or as otherwise directed by the Fire Department. Size of lettering shall be not less than 24 inches in height and three inches (3") in stroke.

**Enforcement of Fire Lanes:**

The enforcement of fire lanes as specified under California Vehicle Code (CVC) Section 22500.1. may be enforced under the Jurisdiction of the Barstow Police Department, San Bernardino County Sheriff, California Highway Patrol and the Barstow Fire Protection District.

**FIRE APPARATUS ACCESS ROADS AND FIRE PROTECTION WATER SUPPLY DURING CONSTRUCTION:** All Fire Apparatus Access Roads, and all required fire protection water supplies, shall be installed and made serviceable prior to bringing combustible construction materials onto the project site. Driveways and access roads must meet construction conditions as specified in the City Street Design Standards.

**FIRE APPARATUS ACCESS ROADS AND FIRE PROTECTION WATER SUPPLY DURING CONSTRUCTION:** For structures with a ridgeline of at least 35 feet above adjacent rough fire access grade, or for structures with three (3) or more stories, one and one half (1.5) inches of asphalt base over four (4) inches of aggregate base shall be provided in all proposed and approved fire access areas. Base shall be Class II aggregate base or alternative recommended by the soils engineer and approved. Base shall be placed only on an unyielding excavated and drained subgrade, and to be compacted to at least 90 percent relative compaction.



Barstow Fire Protection District	Standard #	BAR 3	Standard <b>BAR3</b>
861 Barstow Road	Description:	FIRE DEPARTMENT ACCESS	
Barstow, California 92311			
(760) 256-2254	Revised:	12/2016	

**Barstow Fire Protection District**  
Barstow, California  
Access & Address Identification - Standard

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**Access Identification:**

**Apartments** - An illuminated, diagrammatic representation of the apartment complex shall be installed at the primary vehicular entrances to each apartment complex unless otherwise indicated by the fire chief. The diagram should be large enough to be legible from a vehicle. Each building shall be marked at a location clearly visible from the street and/or the nearest vehicular access. Markings shall include building number/letter and numbers of units located in that building.

Example:

Bldg. "B"  
Units 1-8

Building designation  
Units in building

The building number or letter and the apartment number or letter shall be 6" high with a stroke of 3/4" and shall contrast with the background. Exterior lighting shall be provided which will illuminate the building identification sufficiently to render it visible from the vehicular access. The individual apartments shall be identified by numerals and/or letters centered in the upper half of the primary entrance door. If the numbers would be concealed by a screen door (if placed on the door), then they shall be placed on the doorframe or other location immediately outside the door and visible from all angles of approach. Additionally, if the apartment has access via a rear patio door or gate, it shall also be marked in the same manner. The numbers or letters shall be at least 3" tall and of at least 1/2" stroke. They shall all be of contrasting color to the background.

**Commercial** - Individual buildings shall be addressed front and back. Minimum numeral size is 6" high with 3/4" stroke and shall contrast with the background. Exterior lighting shall be provided which will illuminate the building identification sufficiently to render it visible from the vehicular access. When vehicular access is afforded to the rear of the building, rear doors servicing individual businesses shall be marked to indicate the address and unit identification, if unit identification is applicable.

**Industrial** - Individual buildings shall be marked at a point clearly visible from the street and/or the nearest vehicular access. Minimum size shall be 12" high with a 1-1/2" stroke and shall contrast with the background. Exterior lighting shall be provided which will illuminate the building identification sufficiently to render it visible from the vehicular access. When vehicular access is afforded to the rear of the building, rear doors servicing individual businesses shall be marked to indicate the address and unit identification, if unit identification is applicable.

**Warehouses** - Individual units shall have unit and the number/space listed above the main entrance. The building shall be marked at the point nearest the street. Units with frontage on both sides of a building shall have identical markings on both sides. Minimum size for individual units shall be 6" high with a stroke of 3/4" and shall contrast with the background. Exterior lighting shall be provided which will illuminate the front building identification sufficiently to render it visible from the vehicular access. When vehicular access is afforded to the rear of the building, rear doors servicing individual businesses shall be marked to indicate the address and unit identification, if unit identification is applicable.

In all buildings numeral/letter height and stroke shall be doubled for each additional 100' of setback up to 300'. All accessory rooms shall be labeled to the satisfaction of the Barstow Fire Protection District. Building identification materials, including paint colors and exterior lighting fixtures, are subject to approval by the Planning and Development Department. Alternatives to the methods addressed in this document should be presented to the Fire Prevention Bureau and to the Planning and Development Department for consideration and approval.

Barstow Fire Protection District	Standard #	BAR 4	Standard <b>BAR 4</b>
861 Barstow Road	Description:	ACCESS IDENTIFICATION	
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**

Barstow, California

Access &amp; Address Identification - Standard

Maintenance of building identification is the responsibility of the building owner and/or manager.

**NOTE:** The above is a summary and may not include all the requirements for your business.

**ADDRESS IDENTIFICATION:****GENERAL:**

A. Approved numbers or addresses shall be provided for all new and existing buildings in such a position as to be **plainly visible and legible from the street or road fronting the property and at additional locations on the building as required by the chief.** Numbers shall contrast with their background. (no brass or gold colored numbers). Illuminated either internally or externally.

B. When required by the chief, additional numbers or addresses shall be provided on an elevated post or monument adjacent to roads or driveways leading to buildings. Illuminated either internally or externally.

C. Approved street or road signs and address numbers shall be installed prior to occupancy of any new building, and prior to construction when required by the Chief.

D. Complexes with multiple buildings the chief may require directories, premises maps and directional signs at approved locations. When required, a site plan shall be submitted to the Fire District for approval indicating entrances, access drives, and buildings. The plan shall also include the location and details of directories, maps, signs, building and unit numbers and any other information deemed necessary by the Fire District. See Directory Requirements.

**REQUIREMENTS:**

A. One and Two Family Dwellings and Mobile Homes: Address numbers shall be a minimum of four (4) inches in height. Where buildings are set back from the street, larger numbers shall be required. Illuminated either internally or externally.

B. Commercial and Industrial Buildings: Address numbers shall be a minimum of six (6) inches in height. Where buildings are set back from the street, larger numbers shall be required Suite numbers shall be above or adjacent to the entrance door. Multi-unit buildings with rear doors shall also provide suite numbers above or adjacent to each rear door. Numbers shall be four (4) inches in height, contrasting in color to the background, no brass or gold colored numbers, and readily visible. Illuminated either internally or externally.

C. Apartments, Townhouses, Condominiums: Building address numbers shall be a minimum of six (6) inches in height, contrasting in color to the background, no brass or gold colored numbers, and readily visible. Each individual unit number shall be above or adjacent to the entrance door. Numbers shall be four (4) inches in height, contrasting in color to the background, no brass or gold colored numbers, and readily visible. Illuminated either internally or externally

**DIRECTORY REQUIREMENTS:**

A. Provided at every entrance into the complex.

B. Set back two (2) feet from the curb, facing the driveway.

C. Minimum size: 3 feet x 2 feet.

D. Individual unit numbers: minimum ¼ inch in height.

E. Building numbers: minimum 3/8 inch in height.

F. Lettering: minimum ½ inch in height.

G. Illuminated either internally or externally

H. Subject to Fire District approval prior to directory printing and installation

Barstow Fire Protection District	Standard #	BAR 4	Standard <b>BAR 4</b>
861 Barstow Road	Description:	ACCESS IDENTIFICATION	
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**  
Barstow, California

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**RESERVED FOR FUTURE USE**

Attachment: BFPD Standards Fire Ord 29 (5525 : Ordinance No.30-2023 Adoption of and Amendment to the 2022 California Fire

Barstow Fire Protection District	Standard #	BAR 5	Standard <b>BAR5</b>
861 Barstow Road	Description:		
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**  
 Barstow, California  
 Key Box - Standard

**GENERAL**

All key boxes shall be hinged. The key box shall be a single key entry lock only. The lock cylinder shall be the Barstow Fire Protection District registered UL listed Medeco lock.

**CONSTRUCTION**

*Low-Rise Buildings* — The key box housing shall be 1/4" plate steel. The door shall be 5/8" steel, with a 1/8" dust and moisture cover over the lock. The door opening shall be fitted with a weather resistant gasket. The key box minimum dimensions shall 7" H x 7" W x 5" D, this excludes the flange for recessed mounting which may vary in width.

**COLOR**

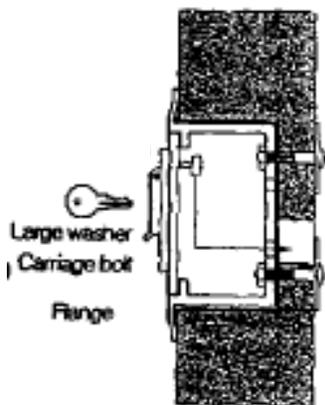
All key boxes shall be red, black or silver. Black and silver boxes shall require the word FIRE placed on the door. The letters shall be 3/4" minimum and of red reflective color.

**INSTALLATION**

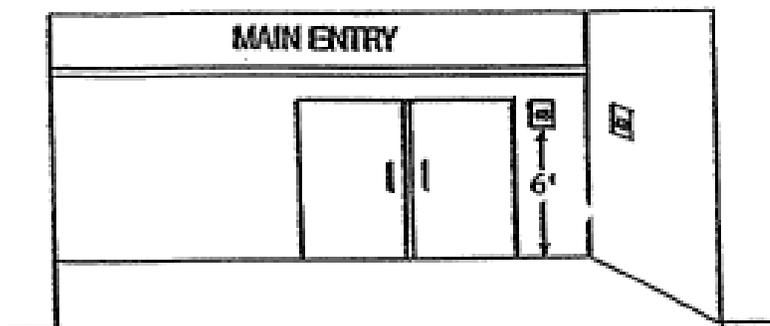
Key boxes shall be flush or recessed mounted only.

**PLACEMENT**

The bottom of the key box shall be 36-60 inches above the adjacent floor and mounted within 10 horizontal feet of the main entry door and clearly visible.



Recessed Mount



***Installed per manufacturer specifications.***

Barstow Fire Protection District	Standard #	BAR 6	Standard <b>BAR6</b>
861 Barstow Road	Description:	Key Box Requirements	
Barstow, California 92311	Revised:	01/2014	
(760) 256-2254			

Attachment: BFPD Standards Fire Ord 29 (5525 : Ordinance No.30-2023 Adoption of and Amendment to the 2022 California Fire

**Barstow Fire Protection District**  
 Barstow, California  
 Temporary Water Supply - Standard

Approved Plans shall not be issued until the Fire District inspects and approves fire department water supply.

Alternate Methods below -

Water Supply:

Public water supplies shall only be considered to be established upon notification of the Fire District by the water purveyor.

Private (on-site) water supplies shall only be considered to be established upon inspection and approval of a representative of the Fire District.

On-site hydrants will be considered to be established and available for fire department use when the following criteria are met:

- Flushed and cleared of debris
- Gate valve is accessible
- Chlorination completed certification by the water purveyor.
- Height and orientation approved
- Temporary crash posts installed if necessary

Alternate Method:

Applicant must submit a letter on company letterhead agreeing not to deliver any combustible material on site except for construction material necessary to build forms for concrete installation. The letter must also indicate a time frame for the temporary situation.

A letter detailing procedures for the notification of emergency services that will be provided to job site superintendents may be required.

Plans requiring approval of the Fire District for the use of temporary water supplies, temporary fire hydrants and temporary water tanks are subject to review and inspection.

Temporary water supply measures may be required. Location(s) of temporary water sources, (temporary fire hydrants or tanks) may also be required for approval.

Barstow Fire Protection District	Standard #	BAR 7	Standard <b>BAR7</b>
861 Barstow Road	Description:	Temporary Water Supply	
Barstow, California 92311	Revised:	01/2014	
(760) 256-2254			

**Barstow Fire Protection District**

Barstow, California

Fire Flow Requirements - Standard

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Fire hydrants and required access roads shall be provided prior to and during the time of construction. MINIMUM FIREFLOW MAY NOT BE BELOW 1500 GPM FOR ANY OCCUPANCY.

**One- and Two-Family Dwellings:**

The minimum fire-flow and duration requirements for one-and two-family dwellings and U-1 private garages shall be 1500 gallons per minute for two hours. When approved the following may be applied:

**Exceptions:**

- a) A reduction in required fire-flow of 50 percent, as approved by the chief, is allowed when the building is provided with an approved automatic sprinkler system.
- b) Where there is no water purveyor or the water purveyor's current system cannot meet fire-flow or duration requirements without excessive system modifications, an on-site water storage tank may provide the fire protection water supply when the building has an approved automatic sprinkler system. The location, capacity, connections and other appurtenances of the tank shall be approved.
- c) Buildings classified as Group R, Division 3 Occupancies with a total fire area of 700 square feet or less are not required to provide fire-flow.

**Buildings other than Single Family Dwellings.**

The minimum fire-flow and flow duration for buildings other than one-and two-family dwellings shall be as specified in Table No. B105.1 (International Fire Code, 2012 Edition) See Fire-flow amounts shall be rounded up to the nearest increment of 250 gallons per minute. When approved the following exceptions may be applied. NOTE: The resulting fire flow shall not be less than 1500 gallons per minute when any exception is applied.

**Exceptions:**

- a) A reduction in fire-flow of up to 50 percent, as approved by the chief, is allowed when the building is provided with an approved automatic sprinkler system. The resulting fire-flow shall not be less than 1500 gallons per minute.

Note: When using this option, the resulting fire flow shall be provided for every 10,000 square feet of building area or portion thereof. The fire sprinkler demand only needs to be provided once per building. Use of this option is limited to 1-2 buildings on the same property and ownership.

- b) Buildings classified as Group U, agricultural buildings used as barns, stables, poultry buildings and other similar uses with a total fire area of 1500 square feet or less are not required to provide fire-flow.

Barstow Fire Protection District	Standard #	BAR 8	Standard <b>BAR8</b>
861 Barstow Road	Description:	FIRE FLOW REQUIREMENTS	
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**

Barstow, California  
 Fire Hydrant - Standard

ALL FIRE HYDRANTS SHALL COMPLY WITH AWWA/ANSI STANDARD C502-94.

COLOR CODING OF HYDRANTS SHALL BE INDICATED BY GALLONS PER MINUTE FLOW. ALL FIRE HYDRANTS SHALL BE FACTORY PAINTED YELLOW AND COLOR CODED AS FOLLOWS:

HYDRANT BONNETS:

- 1500 GPM OR GREATER-----BLUE
- 1000 GPM -----GREEN
- 500 – 1000 GPM-----ORANGE
- LESS THAN 500 PRM-----RED

THE BONNETS OF THE FIRE HYDRANTS WILL BE COLOR CODED BY THE INSTALLING CONTRACTOR IN ACCORDANCE TO THE ABOVE SPECIFICATIONS. FIRE DISTRICT PERSONNEL ARE REQUIRED TO WITNESS THE FLOW TESTS. THE FIRE DISTRICT WILL BE NOTIFIED 48 HOURS PRIOR TO THE FLOW TEST.

RESULTS FROM THE FLOW TEST SHOULD BE DOCUMENTED.

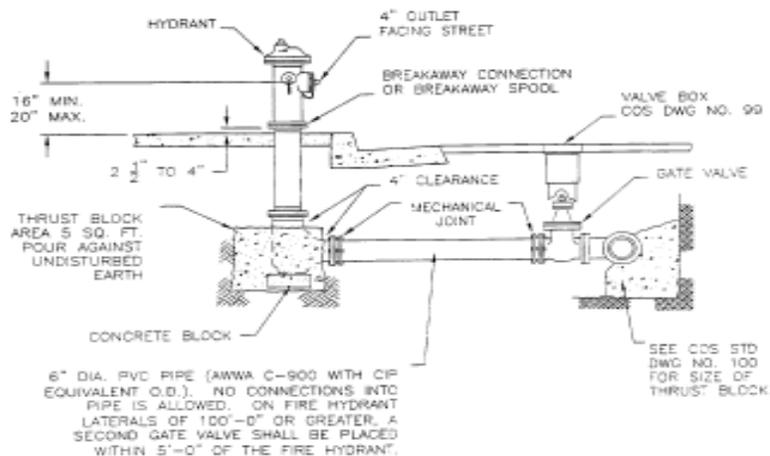
FIRE HYDRANTS SHALL BE LOCATED WITHIN THREE FEET (3') OF THE CURB LINE OF THE FIRE LANES.

THE CENTER OF A HOSE OUTLET SHALL BE NOT LESS THAN 18 IN. (457 MM) ABOVE FINAL GRADE, OR WHEN LOCATED IN A HOSE HOUSE, 12 IN. (305 MM) ABOVE THE FLOOR (NFPA 24 4-33 2012 EDITION).

ONE (1) BLUE DOUBLE-REFLECTIVE DEPARTMENT OF TRANSPORTATION TYPE ROAD MARKER IS TO BE ADHERED TO THE HARD SURFACES ROADWAY IN THE MIDDLE OF THE LANE NEAREST TO, AND DIRECTLY IN FRONT OF, THE NEWLY INSTALLED FIRE HYDRANTS.

FIRE HYDRANTS TO BE PROVIDED WITH GUARD POSTS IF REQUIRED.

A THREE FOOT CLEARANCE SHALL BE PROVIDED TO FRONT, SIDES, AND REAR OF ALL HYDRANTS AND FIRE DEPARTMENT CONNECTIONS.



Barstow Fire Protection District	Standard #	BAR 9	Standard <b>BAR9</b>
861 Barstow Road	Description:	FIRE HYDRANT STANDARDS	
Barstow, California 92311	Revised:	01/2014	
(760) 256-2254			

Attachment: BFPD Standards Fire Ord 29 (5525 : Ordinance No.30-2023 Adoption of and Amendment to the 2022 California Fire

**Barstow Fire Protection District**

Barstow, California

Plans - Standard

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**PLANS STANDARDS & CONTENTS**

**General** - Site Plans shall be prepared by appropriate design professionals (surveyor, engineer, architect, and / or landscape architect) licensed to practice in the State of and shall bear appropriate registration stamps. All Site Plan drawings shall be in sufficient detail and accuracy, (generally A-2), to enable the construction of all site improvements shown and approved on the drawings.

**Contents** – Title Block in the lower right hand corner with project name, address of property, name and address of developer, property owner, and applicant; north arrow, scale of not more than 1":40', plan date with revision dates, seals and signatures, names and addresses of all appropriate design professionals;

A location map at the scale of not less than 1" to 600' showing the proposed project and the nearest street intersection; Boundary survey of site include distances with angles or bearings, building/setback lines, and street lines; right of way lines;

Locations and descriptions of all existing and proposed easements and rights-of-way;

Zoning classification of property;

Area of lot;

Buildings / improvements on abutting parcels within 25'; include name of adjacent owners & zoning classification; Existing and proposed contours or spot grades at no more than 2 foot intervals;

Locations of existing & proposed buildings w/ dimensions, area, elevations & number of stories & distances between all buildings & property lines;

Locations of other improvements and structures to include signs, fences, and walls;

Existing and proposed water lines and hydrants,

Existing and proposed sidewalks, curbs and curb cuts, and adjacent streets;

Existing and proposed landscaping

Layout of all off street parking areas showing details and dimensions of aisles, driveways, each parking space, all loading and unloading areas, pavement markings, location of directional signs and ADA-compliant spaces;

Fire lanes and traffic control signs as required by government authorities;

Outside storage areas with proposed screening;

Location of outside recycling and refuse storage area and proposed screening;

Plan Certification: Notation on Site Plan that Plan's preparer certifies to the best of his/her knowledge, belief, and ability, and after research and inquiry, the proposed Plan meets all of the standards of the appropriate codes and conditions.

**Engineering:** Any improvements proposed to become owned, operated, or maintained by the City shall have documentation that such improvements have been designed in accordance with accepted engineering practices and will be in compliance with all applicable Codes and regulations governing such areas as pipe size, flow lines, invert and top of grate elevations, existing and proposed elevations, and construction practices and materials.

**Structural:** Submit three (3) sets of plans for proposed buildings, structures, signs, including floor plans & exterior elevations.

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## FIRE ALARM SYSTEMS GENERAL:

This standard sets forth the requirements for the design, installation, testing, maintenance and monitoring of all fire alarm system installations in the Barstow Fire Protection District, including those monitoring sprinkler systems. All such fire alarm systems shall conform to this Standard and the following documents:

- The Barstow City Building Code (2016 California Building Code as amended), and;
- The California Fire Code (2016 California Fire Code as amended), and;
- NFPA Standard 72, "National Fire Alarm Code", 2010 edition, and;
- Nationally recognized standards as accepted by the Fire Chief

Required submittals, reviews, approvals, and inspections by the Barstow Fire Protection District are based upon Barstow Fire Protection District and City adopted codes and ordinances, Barstow Fire Protection District Standards, and nationally recognized standards. Such submittal requirements, reviews, approvals, and inspections do not purport, however, to evaluate for compliance with the "Americans with Disabilities Act" (A.D.A.). Compliance with the A.D.A. is the sole responsibility of the owner/applicant.

All companies monitoring, installing, maintaining, or servicing fire alarm systems within Barstow shall have a valid Barstow business license, and a valid California State Electrical Contractor's License. All installers shall hold a California State fire alarm installers card or a journeyman electricians card per applicable state statute. An apprentice (training) certificate is acceptable for installers of fire alarm systems when supervised by a journeyman installer. Anyone doing acceptance tests, confidence tests, modification, repair, remodel, or addition to a new or existing system shall also have Certification appropriate to the alarm work being done.

### REQUIRED INSTALLATIONS:

Fire alarm systems shall be installed whenever required by the International Fire Code, California Fire Code, NFPA Standard, or other adopted code. Generally fire alarm systems shall be installed to monitor sprinkler systems; alert occupants of sprinklered buildings; provide protection for buildings, over 5000 square feet.

Building area (square footage) calculations used for determining fire alarm system requirements shall be computed based upon the (total) gross square footage on all floor levels (under roof).

### PERMITS AND PLAN REVIEWS; GENERAL

For installation or modifications, separate fire alarm system permits are required for *each* system, portion of a system, or building. Permit applications and plan submittals shall be in accordance with Barstow Fire Protection District, Ordinance 27. Plan submittals shall reflect the minimum design standards as set forth in NFPA 72.

### DEFINITIONS:

Dead Panel - A condition of any fire alarm control panel where the panel has lost both its primary and secondary sources of power.

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Designer of Record. - A competent individual acceptable to, and in good standing with, the Barstow Fire Protection District who designs or directly supervises the *design* of all fire alarm system submittals, resubmittals, and field changes, until complete installation, testing, and final Fire Department acceptance.

Device – All individual system components including, but not limited to, control units (panels), annunciators, power supplies, manual fire alarm boxes (pull stations), initiating devices (including detectors), notification appliance (audible or visible), transmitters/transponders, door closure holders, any fire safety or related equipment directly operated by a control unit, or similar.

F.A.C.P. – The Fire Alarm Control Panel is the sole, primary fire control unit (panel) for the building.

Fire Code Official – The representative of the Fire Prevention Bureau and the representative of the Chief of the Barstow Fire Protection District authorized to administer, interpret, and enforce the Fire Code, or their designees. Authorized designees shall be members of the Fire Prevention Bureau. On specific occasions or for specific tasks, other members of the Barstow Fire Protection District may be assigned duties as an authorized representative of the Chief.

Fire Watch – The provision of a competent person or persons responsible for the detection and reporting of a fire or other similar hazard in or on a complex, building, or property. This person must speak, read, write, and understand the English language. "Fire Watch" may be used synonymously with "Standby Personnel" A "Fire Watch" shall maintain a record of their activity or rounds as directed by the Fire Prevention Bureau. "Fire Watch" for further information.

Fittings - refers to junction ("J") boxes, splice boxes, pull boxes, or detector bases where electrical connections are made.

Monitor – Ability of an approved central station to receive an alarm, supervisory, or trouble signal in an approved manner from a fire alarm system at a protected site, or the ability of an approved control panel to receive a signal from a device.

N.F.P.A. - refers to the National Fire Protection Association.

National Fire Code - refers to published codes, standards, recommended practices, and guidelines prepared by technical committees organized under NFPA sponsorship.

Private Office - A room or area used for the purpose of conducting business or professional administrative services for 1 or 2 named occupants. Offices for use by an employee of a designated type (such as "lab technician only") are not considered private.

Runner Service (or emergency repair service) - A technician or other qualified person (other than the required number of operators), who shall be on duty at all times at the central station, a runner station, or in a vehicle in constant radio contact with the central station, available for prompt dispatching, when necessary, to a protected premises within the minimum time frames established in NFPA 72, 4-2.6.1 for the purpose of investigating signals, emergency maintenance, repair and/or restoration of the system (1 hour for an alarm signal, 1 hour for a supervisory signal, and 4 hours for a trouble signal).

Supervised – Having the ability to verify alarm device, wiring, and/or signal line integrity.

Townhouse-style unit – A multi-floor apartment or condominium that is a single living unit.

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**Designer of Record:**

The designation "Designer of Record" shall refer to a competent individual acceptable to, and in good standing with, the Barstow Fire Protection District who designs or directly supervises the *design* of all alarm system submittals, resubmittals, and field changes, until complete installation, testing, and final Fire Department acceptance. This person shall be designated at the beginning of the job and follow it through to completion.

Acceptable proof of competence shall be any one of the following:

A valid State of California Professional Electrical, or Fire Protection Engineer's license. Documentation of certification shall be provided to the Fire Chief. Satisfactory documentation shall be accepted in writing by the Fire Marshal and by the assignment of a designer number.

A valid NICET Level II, III, or IV Certification for Fire Alarm Systems. Documentation of certification shall be provided to the Fire Chief. Satisfactory documentation shall be accepted in writing by the Fire Marshal and by the assignment of a designer number.

**PERMITS:**

Valid permits from the Barstow Fire Protection District and the City of Barstow Building Department shall be posted on site.

Installation or modification shall not be performed without valid permits on site, except for maintenance or emergency repair work. Work begun under the electrical permit only, proceeds at the installers risk, and shall not include the placement of devices or equipment. The only low voltage fire alarm work allowed under an electrical permit only is the stringing of wire and the placement of mounting plates or back boxes.

**PLANS AND SPECIFICATIONS, STANDARD PERMIT SUBMITTAL:**

Five (5) complete sets of plans along with specifications, calculations and a completed permit application form shall be submitted to the City of Barstow's Building Department. All applicable items identified in NFPA 72 A-1-5.5.2.1 and any information required by this section shall be submitted. The submittal shall also include one copy of manufacturers specification sheets on all equipment to be used. Items used shall be clearly marked to indicate the specific model of equipment used. Incomplete submittals may be subject to delay in recording, or review, or to rejection.

Plans shall include exterior elevations to indicate the location of exterior horn/bell/strobe units and/or annunciators; interior cross sections showing typical areas, concealed spaces or unusual construction characteristics; a riser diagram; and details showing structural and/or mechanical elements which might affect spacing requirements (including any obstruction over 80" A.F.F.).

Plans shall include an accurate, dimensioned, floor plan to scale (1/8"=1') and shall clearly identify the use for all areas shown. At a minimum all areas of work and all adjacent areas shall be shown and labeled. Plans shall include a wiring diagram (per floor) overlaid on the floor plan. The wiring type, size, and number of conductors shall be noted clearly, and identified where changes occur. The location of all power supplies and shut offs shall be shown. Placement of all devices shall be shown. All fire sprinkler switches, and alarm or supervisory devices shall be shown.

Location of each and every system component shall be identified using an appropriate symbol as described with a key on each sheet of the plans that show such components. A recommended

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symbol key is available upon request. Nonstandard symbols may cause delay in review or inspection.

All system components shall be identified on a component schedule identifying the amount of material, or number of devices to be installed, the temperature rating and power demands (if applicable), manufacturers name, and model number of each type of device, equipment, or material.

Provide a plan view schematic for each floor, showing all zones (including existing zones shown on an existing control panel, if applicable). All zones must be labeled with a unique and individual letter or number, and identified clearly as to their respective areas of coverage. The schematic shall indicate which zones are to be transmitted individually and which zones are to be grouped for transmission to the central station.

### **FIRE ALARM SYSTEMS**

Battery calculations shall follow an approved format. A battery calculation shall include a listing of the current used by any and all energy consuming devices or equipment, each device powered by the batteries for both standby and alarm mode, and the current rating of the power supply. 30% shall be added under "standby" and "alarm" modes for battery depletion buffer. Voltage drop calculations shall be attached to the battery calculation form. This is required for both new and remodeled systems. Voltage drop calculations shall also identify (for the acceptance test) the acceptable minimum end of line voltage for the specific equipment used. The cover sheet of the plan submittal shall include the name, telephone number, and the State license number of the design and installation company; the job address; the job site phone number; the name of the tenant; the name and phone number of the building owner; the name, address, and phone number of the approved monitoring company; and the name, address, and phone number of the general contractor for the project.

The Designer of Record shall be responsible for the compatibility of all system equipment including the FACP and transmitter, regardless of who is supplying or installing the equipment. FACP and transmitter design shall be submitted together. Installation, monitoring, maintenance, and runner service shall be established by contract prior to design submittals.

### **SYSTEM DESIGN:**

#### **GENERAL SYSTEM AND DESIGN REQUIREMENTS:**

All fire alarm systems and fire sprinkler systems located the Barstow (unless specifically excluded by a provision of these standards) shall be monitored by a U.L. listed central station approved by the Barstow Fire Protection District. Any company providing U.L. listed central station service and which meets the requirements and performance standards for central station monitoring.

All equipment, devices, and wiring shall be listed by Underwriters Laboratories, Factory Mutual, or another nationally recognized testing agency and shall be used in accordance with their listings.

No person shall perform any type of modification to any device or equipment which would void or be contrary to its listing.

All system components shall be compatible and be placement supervised.

Systems shall be divided into separate zones delineated by firewalls, sprinkler system coverage areas, floors, attics, crawl spaces, and/or other significant changes in construction or occupancy. When approved in advance by the Fire Chief, floor zones may be omitted in town house type

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residential units. In these cases a zone shall consist of all floors or levels within each individual dwelling unit and the attic; and each such unit comprises one zone.

Normally open, automatic closing fire doors shall have hold open devices actuated by the fire alarm control panel utilizing smoke detectors installed in approved locations on one or both sides of the door. The F.A.C.P. may also release the doors on a general or zone alarm. Smoke detectors shall be placed per NFPA standards. Where normally open, automatic closing fire doors separate two or more alarm zones, activation of either zone of automatic fire alarm and/or waterflow shall also release the hold open devices. Failure of primary, or failure of primary and secondary power to the FACP shall also cause release of hold open devices.

AC power requirements shall meet all standards of NFPA 72 Circuits for fire alarm equipment shall be dedicated for fire alarm use only, and so labeled.

All equipment subject to physical damage shall be protected so as not to inhibit required operations.

All initiation and control circuits, and controls, shall be 100% fail safe (controlled functions will occur even with loss of primary and secondary power to the unit or system).

#### **CONTROL PANEL REQUIREMENTS:**

The master code for all fire alarm control panels (FACP) shall be set as 1926 (#) as the default code.

Fire alarm control panels (FACPs) or secondary control units shall be located in an approved location, no higher than 5' 6" above finish floor to the top of the viewing window or controls. In sprinkler protected buildings the FACP will most often be located in the sprinkler riser room. If the FACP is not currently in the riser room, system modifications may require it to be relocated to the riser room. Obtain written verification and submit with the plan.

Panels shall be located in an area that is permanently climate and temperature controlled in order to maintain the rated design limits of the panel.

If the FACP is located in a room that is not normally occupied, then a remote audible/visual trouble annunciator shall be located in a normally occupied room or area near a main entrance.

Panels shall have a labeled light, which will indicate that the system is receiving normal power. A failure of normal power shall cause the light to go out and an audible trouble signal to sound.

All wiring and components of the fire alarm system shall have electrical supervision with audible and visual trouble indication at the panel and where necessary at a remote location, also.

All alarm signals shall "lock in" at the control panel until the activated device or devices are returned to a normal condition, and the control panel is manually reset.

While an alarm signal is "locked in" or silenced, the alarm panel shall be capable of transmitting a subsequent alarm signal to the central station.

A pre-signal feature as found in NFPA 72.1-5.4.10 shall **not** be allowed.

In occupancies that require regular fire drills; such as but not limited to educational, daycare, institutional, nursing, or retirement occupancies; panels shall include an audible test feature.

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When activated the test switch shall energize all interior alarm indicating devices but shall **not** transmit an alarm to the central station.

Upon activation of any alarm-initiating device that is part of the alarm system, the alarm panel shall cause all audible, visible, or voice alarm signal devices within an approved area to operate continuously until the alarm condition is cleared and the panel is restored to normal. This operation may be interrupted by the approved manual operation of an alarm silence switch or by an approved voice evacuation message. If the area of alarm is to be less than the entire building, a sequence of operations plan/matrix, compatible with an approved master evacuation plan for the facility shall be included with the submittal. The area of notification shall be no less than the zone of activation and all adjacent zones.

Various zones of initiating devices shall be grouped by type (waterflow, afa, or supervisory) within the alarm panel except approved addressable systems. Generic Language such as General Alarm shall not be permitted. Specific Zones shall be identified as to the appliance floor and location.

All alarm zones shall have a red alarm indicator light to indicate an alarm mode and an amber or yellow light to indicate a trouble condition for that zone (except approved alpha numeric displays).

An alarm zone shall be used to indicate activation of any suppression system.

All supervisory zones shall have an amber or yellow light to indicate activation of that zone and an amber or yellow light to indicate a trouble condition for that zone (except approved alpha numeric displays).

Trouble, supervisory, and alarm signals shall be distinctive from each other. An alarm shall cause operation of all alarm indicating or signaling devices applicable to that zone activation.

Supervisory device activation shall not operate any alarm signaling devices unless specifically allowed by the Fire Marshal in coordination with an approved evacuation plan, such as may occur for some hazardous material spill notification devices. They shall activate a distinctive audible device at the panel and transmit an appropriate signal to the central station.

#### **TRANSMITTERS:**

Fire alarm transmitters shall be located in the same room as the FACP. It shall be climate and temperature controlled to maintain the rated design limits of the equipment.

Transmitters shall be multiplex and compatible with the FACP.

#### **WIRING:**

Class B fire alarm wiring is acceptable for fire alarm systems unless otherwise required by the Fire Chief or other authority. Certain occupancies such as hospitals require class A wiring. All junction ("J") boxes used for low voltage fire alarm wiring shall have red painted cover plates.

All alarm wiring below 7' shall be in conduit or otherwise protected in an approved manner.

Fittings shall be completely enclosed, marked as required, and comply with the (NEC as adopted). Devices not requiring such boxes shall be so listed and clearly identified.

#### **BATTERY REQUIREMENTS:**

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A rechargeable battery backup is required on all fire alarm installations. Batteries shall have enough capacity to operate the alarm system in a standby mode for twenty-four (24) hours, and then be capable of energizing all signaling devices for at least five (5) minutes. Some special systems such as voice evacuation require a longer minimum time. An additional 30% shall be added as a battery depletion buffer. An example battery calculation form is available upon request. Approved battery/generator backup may be used in lieu of battery-only backup with the prior approval of the Fire Chief.

#### **ANNUNCIATORS:**

Remote alarm, trouble, and supervisory annunciation is required unless all fire and supervisory zones report to the central station. It shall be located on the exterior at a main entry.

Fire alarm annunciators shall be located in an approved location, no higher than 5' 6" above finish floor to the top of the viewing panel or controls.

#### **INDICATING DEVICES:**

Audible devices shall be placed in all buildings with automatic fire alarm systems so that with all intervening doors closed, the alarm device will be heard throughout the room or area at no less than 60 dBA and at least 15 decibels above the ambient noise level whichever is greatest. The Designer of Record shall evaluate the anticipated ambient noise level based upon the intended uses and national standards, and identify the anticipated ambient level and performance test level on the face of the plans. See NFPA 72 6-3.2.2.

Where ambient noise levels regularly exceed 105 dBA approved visual indicating devices shall be used in conjunction with audible devices. In these cases particular attention should be given to the orientation of visual devices in relationship to the anticipated location of equipment or machinery operators. In no case shall sound pressure exceed a measured reading of 120 dBA anywhere within the occupied area.

There shall be a minimum 10" fire alarm bell/clear strobe light located on the exterior of all buildings with a required fire alarm system, or a sprinkler system monitored by a fire alarm system. The bell/strobe shall be located on the upper 25% of the building's exterior, facing the street or roadway off of which the building is addressed; or facing the roadway which serves as the main vehicle entrance from that street or roadway; or as directed by the Fire Marshal. A lower location shall be used when tall buildings are built close to a narrow right of way or to avoid obstructions. In these cases a sight line detail shall be included in the plan submittal. Neither horns nor horn/strobes shall be used to satisfy this requirement.

For visual device placement see NFPA 72 Chapter 6. The maximum height of 96 inches may be exceeded if it is demonstrated that it will result in better observation of the alarm signal.

#### **INITIATING DEVICES:**

All detectors or other initiating devices shall be installed according to this section, the manufacturer's specifications and instructions, and NFPA 72 chapter 5.

Full alarm system coverage for a building shall consist of at least one heat detector, smoke detector or other approved device placed in all rooms, halls, storage areas, basements, attics, lofts, spaces above suspended ceilings, concealed spaces, enclosed storage lockers, closets, walk-in closets or storage containers, attached carports or canopies, booths, saunas, electrical rooms, machine or elevator equipment rooms, and any other rooms, areas, or spaces having an

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area of ten (10) square feet or more unless specifically noted in this section or unless specifically determined by the Fire Chief as being not required.

At least one fixed temperature heat detector shall be located in attached, exterior, storage areas regardless of square footage.

At least one fixed temperature heat detector shall be located in a kitchen area regardless of square footage.

If exposure to weather or moisture is high, care should be taken to prevent moisture from entering any portion of the device including back boxes or mounting plates.

Smoke detectors shall not be used in kitchen areas, lunch rooms, waiting areas, lobbies, shops, or any other area where there is anticipated to be smoke or dusts.

For special hazards, processes, unusual designs, or construction restraints; rate compensation tubes, beam type detectors, flame detectors, line type detectors, air sampling systems, or similar may be used with the concurrence of the Fire Chief.

Manual pull stations when required in Residential, Assembly, Educational, and Institutional occupancies shall be installed adjacent to all exits or as specifically required by the Fire Code or Fire Marshal. Installation heights shall be no higher than 48 inches A.F.F. (as designated for all approaches identified in the accessibility standards).

Pull stations that are subject to repeated false alarms shall be fitted with an approved, local-alarming, cover.

Exterior manual pull stations require an approved weatherproof enclosure unless specifically listed for such use without such an enclosure.

Devices and equipment shall be physically protected from construction dust, moisture, or debris until final inspection, or they shall be replaced, prior to final testing, with new devices or equipment.

For smoke detector spacing in high air movement areas with air changes up to 60 per hour. See NFPA 72 Table 5-3.6.6.3. For greater air movement use devices listed for the corresponding greater velocity.

Duct detectors for the control of air handling equipment shall be reported as a supervisory zone and not as an alarm zone.

#### **MONITORING:**

This section covers minimum standards for signaling systems used to provide approved central station monitoring within the jurisdiction of the Barstow Fire Protection District. Protective signaling systems have been in use for many years, and their value in connection with the fire hazard is recognized as applying both to the protection of life and to the prevention of property damage. The general experience with all protective signaling systems is that dependability of service is directly proportional to the amount and effective character of maintenance, testing, and supervision, and that these functions are best performed when the owner or occupant of the protected premises contracts for service with a listed or approved central station.

All required fire alarm systems, sprinkler systems, or specialized fire protection or extinguishing systems within the jurisdiction of the Barstow Fire Protection District shall be monitored by an

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approved central station meeting and maintaining all of the standards within this section in a manner as noted in except for residential R-3 occupancies.

All required fire systems within the jurisdiction of the Barstow shall be monitored with approved **Central Station Service** per NFPA 72 and this section except R-3 single family residences less than 6000 square feet and other occupancy classes less than 3000 square feet. Neither Remote nor Proprietary systems shall be acceptable for meeting this requirement.

All fire system monitoring shall utilize only approved means of transmission of signals. Alarm transmission shall be by an approved active multiplex transmitter able to transmit and receive status changes, manually or automatically, from an approved alarm panel to an approved central station by one of the following methods:

- a) Direct wire,
- b) Dedicated leased telephone lines,
- c) "Scan Alert",
- d) Two-way Radio Frequency multiplex system with digital dialer backup,
- e) Digital Communicator signal transmission over a "Scan Alert" supervised line using a listed internal or external STU, or
- f) By other means as approved by the Fire Marshal.

Digital dialers used alone are not approved for primary signal transmission. McCulloh or McCulloh loop are not approved.

All central stations serving protected sites in Redmond shall have a direct ring down line to the E.F.C.C. as the **primary** means of alarm transmission.

All alarm, supervisory, and trouble signals shall be transmitted and identified accurately at the central station as to what they indicate (type and location of the particular zone as shown at the FACP).

All specialized systems such as hood and duct extinguishing systems, halon systems, etc. shall be monitored and transmitted as a separate alarm zone. These systems shall be designed to operate from their own dedicated control panel for operation of the system and shall output alarm and trouble signals to the FACP. In small facilities these may be operated from the FACP with the approval of the Fire Chief. All equipment used shall be compatible.

**9.4.12;** The prime contractor shall indicate that the fire alarm system that is providing service at a protected premise complies with all the requirements of this code by providing identification of a means of third party verification as specified in NFPA 4-2.2.3.1 or 4-2.2.3.2.

Access to all fire alarm control panels shall be secured with a lock. Alarm company representatives or subcontractors (with the central station, the installation company, the maintenance company, or emergency repair service company), sprinkler contractors trained by the alarm company, or representatives of the Barstow Fire Protection District shall be the only persons authorized to open or operate an alarm panel.

All buildings having required fire protection systems shall install an approved emergency key box. The location of the key box installation shall be as directed and approved by the Fire Chief. All entrance door keys, grand master keys, master keys, any special keys or access cards, and alarm panel keys shall be labeled and provided by the owner or occupants for installation into the key box. The only approved key box system for use within the jurisdiction or influence of the Barstow is "Knox". Specific information must be obtained directly from the City of Barstow (760-255-5169). For the acceptable installation location contact the assigned Fire Inspector for the job

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AC power circuits for fire alarm equipment shall be labeled as dedicated for fire alarm use only.

When a control panel is located in a room, the outside of the door shall have a sign with minimum 2" high letters with 1/4" stroke which reads "Fire Alarm Room", "Fire Alarm Panel", "Fire Alarm Control", or approved alternate. Signs shall be high-contrast, red and white. In some cases more than one door may be required to be marked in order to identify the panel location. Exterior signs shall be weather resistant. Where the alarm panel room is also the sprinkler riser room both designations shall be used.

Panels with an audible test feature shall have such features clearly labeled and secured.

The installation shall be placarded.(FM)

Signaling systems providing service that complies with all requirements of NFPA 72 shall be conspicuously marked by the central station to indicate compliance. The marking shall be by one or more securely affixed placards.

#### 9.6.1; ACCEPTANCE TESTING:

Prior to requesting a final system inspection and acceptance test the installer shall perform a satisfactory, 100% test of the system. The entire system shall be complete from devices to panel to central station unless a phasing plan has been approved to the request for final inspection of the system.

The alarm control panel, devices, and wiring shall be inspected for placement supervision of all components. At a minimum, a representative number shall be tested for placement supervision at the time of the final witnessed test. The fire inspector may choose to test all detectors. At the discretion of the fire inspector a decibel meter may be used to verify the required alarm signal noise level. A new or recently calibrated meter shall be used in this case.

Where modifications to existing systems in occupied businesses occur, approved testing/recording equipment may be used to record audible levels during prearranged non-business hours in lieu of spot tests during the final inspection.

After all devices selected by the inspector have been tested the installer shall obtain verbal (by phone) confirmation that the central station has received and recorded all signals, has all signals properly identified and has the correct address and contacts for the account.

After the successful conclusion of the acceptance test the remainder of the Certificate of Completion shall be filled out and forwarded to the Barstow Fire Protection District. This shall be accompanied by a hard copy print out of the test signals received by the central station. All zones shall be defined by a written description not merely differentiated by number or letter. This may be done by use of a description key or zone schedule.

#### CERTIFICATE OF COMPLETION:

The Certificate of Completion form shall be completed by the installer and signed by the installation company and the central station prior to recording a copy with the Barstow Fire Protection District. The owner, the installation company, and the central station shall keep copies of the completed certificates for their records.

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The signed Certificate of Completion form and a hard copy print out verifying final inspection test results shall be submitted within 5 working days of passing the acceptance test to the Barstow Fire Protection District.

### QUALIFICATIONS

Except for actions taken by fire department personnel in the performance of their duties all maintenance, inspection, modification, testing, and/or emergency servicing of fire alarm systems as well as installation shall be performed by companies and installers or technicians in compliance NFAP72.

### MAINTENANCE AND REPAIR:

All fire alarm systems shall be maintained in an operative condition at all times and shall immediately be repaired or have parts replaced where defective. Deficiencies which jeopardize the operation of the system, or defective components, shall be remedied immediately. Other system or device deficiencies shall be identified to the owner or owner representative (such as in a confidence test report) and remedied within 30 days.

### FIRE ALARM SYSTEMS

All fire alarm systems shall be extended, altered, or augmented as necessary to maintain and continue protection and comply with standards. Whenever any building, which is protected by a fire alarm system, is altered, remodeled, or added on to the building alarm system shall be similarly altered, remodeled, and/or added on to. This may include replacement of existing equipment not within the area of the remodel when the new equipment is necessary for the system to meet current standards.

Regular inspections and testing of alarm systems shall conform to the following minimum schedule.

Twice per year or more frequently, for all transmitters, and FACPs.

Once per year or more frequently, for waterflow-actuated devices, automatic fire detectors, valve supervisory devices, manual fire alarm boxes, combination night guard and fire alarm boxes, tank water level devices, building and tank temperature supervisory devices, and other sprinkler system supervisory devices. Approximately one half of all the devices in each category shall be tested every 6 months. This may then be coordinated with the testing identified in 3(a) above.

Methods and procedures for inspection and tests of fire alarm system equipment and devices shall be in accordance with NFPA 72, chapter 7.

### NOTIFICATION:

The Fire Department shall be notified when any required fire alarm system is placed temporarily out of service and upon restoration of normal service.

Central Stations shall notify the City of Barstow in writing *at least* 14 days prior to the termination of service from an expired contract. This may be by letter, or by fax to (760) 256-1750.

Central Stations shall notify the Barstow Fire Protection District in writing *at least* 21 days prior to the discontinuance of service. This may be by letter, or by fax to (760) 256-1750.

Barstow Fire Protection District	Standard #	BAR11	Standard <b>BAR11</b>
861 Barstow Road Barstow, California 92311	Description:	Fire Alarm Standards – Residential and Commercial	
(760) 256-2254	Revised:	12/2016	

**PROBLEMATIC SYSTEMS OR SYSTEMS OUT OF SERVICE:**

In the event of temporary failure of the fire alarm system or an excessive number of accidental or non-fire alarm activations, the Fire Chief is authorized to require the building owner or occupant to provide standby personnel until the system is restored.

While any system in an **occupied** building is shut down, disabled, disarmed, or placed on standby, the sprinkler or fire alarm contractor, installer, runner, or technician, shall be responsible for performing the duties of a fire watch, including maintaining alertness to a fire generated in any space covered by the inoperative system, notification of all occupants as to the status of the system, and maintaining at all times direct access to a reliable means of communication to the fire dispatch center for reporting of a fire incident.

While any system in an **unoccupied** building, building under construction or building undergoing demolition is shut down, disabled, disarmed, or placed on standby, and there are **workers** in the structure the sprinkler or fire alarm contractor, installer, runner, or technician, shall be responsible for notification of the person with control of the building as to the status of the system. The person with responsibility for the building shall be responsible for notification of all subcontractors and workers under their oversight. In such circumstances this person shall also maintain, on site, at all times, direct access to a reliable means of communication to the fire dispatch center for reporting of a fire incident.

While any system in an **unoccupied** building, building under construction or building undergoing demolition is shut down, disabled, disarmed, or placed on standby, and there are **no workers** in the structure the sprinkler or fire alarm contractor, installer, runner, or technician, shall be responsible for notification of the owner of the building as to the status of the system. The building shall be provided with an approved security plan in keeping with the value of the building and contents. This may range from the temporary boarding up or fencing off of the structure to a full fire watch.

Barstow Fire Protection District	Standard #	BAR11	Standard <b>BAR11</b>
861 Barstow Road	Description:	Fire Alarm Standards – Residential and Commercial	
Barstow, California 92311			
(760) 256-2254	Revised:	12/2016	

Barstow Fire Protection District  
Barstow, California

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### Board of Appeals - Standard

The Barstow Fire Protection District Board of Appeals shall consist of the five members of the Fire Board of Directors and the Fire Chief.

The Board of Appeals shall hear appeals only when called by the Board of Directors and shall hear any and all cases brought for appeal and only upon the given date determined by the Fire Board of Directors. Appeals will be heard during a scheduled meeting of the Fire Protection District Board of Directors meeting determined by the Fire Chief as an agenda item. Time shall be allotted for all parties to be heard. The decision of the Board of Directors will be read at the next regular meeting of the Fire Board of Directors.

Appeals may be heard from a decision of the Fire Protection District concerning the manner of construction or fire protection systems to be used in the construction, alteration or repair of a building or structure.

Appeals must be filed on company letterhead and address the specific decision – finding or requirement appealed. The Fire Chief will direct correspondence to the appealing party(s) informing them of the date the matter will be heard by the Barstow Fire Protection District Board of Directors.

Barstow Fire Protection District	Standard #	BAR19	Standard <b>BAR12</b>
861 Barstow Road	Description:	Board of Appeals	
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**

Barstow, California  
Fire Watch - Standard

1

**INTENT**

To establish consistent guidelines in the implementation of a fire watch.

**STANDARDS**

In the event of the failure of a fire-protection system or an excessive number of accidental activations, the Chief is authorized to require the building owner or occupant to provide fire watch personnel until the system is repaired. In rare cases, the Fire Chief may authorize a Fire Watch when, the fire alarm system cannot be placed in service or has not obtained final acceptance prior to occupancy.

The fire watch personnel shall be provided with at least one approved means of communication to notify the fire department and their duty shall consist of performing constant patrols of the protected premises, keep watch for fires, notifying the fire department of the emergency and evacuating the occupants of the building.

Personnel performing the fire watch must have the following qualifications and perform the listed tasks:

Be at least 21 years of age.

Must be competent, both physically and mentally capable of performing the duties.

Must maintain and possess the Fire Watch Log at all times – The Fire Watch Logs must be a bound notebook with defined areas on each page indicating: DATE, TIME, PERSON CONDUCTING FIRE WATCH ROUNDS, NOTES or FINDINGS and SIGNATURE.

Have access to an approved means of sounding an alarm to evacuate the occupants of the building.

Must have no other duties or responsibilities.

If the area to be patrolled cannot be covered within the 15-minute log intervals, additional fire watch personnel shall be required.

An application for an alternate method must be completed and submitted by the owner or tenant on company letterhead with specific alternate plans to the Fire District for approval prior to the implementation of the fire watch.

Barstow Fire Protection District	Standard #	BAR 13	<b>Standard BAR13</b>
861 Barstow Road	Description:	Fire Watch Standards	
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**

Barstow, California  
Residential Sprinkler - Standard

1 of 2

**RESIDENTIAL OCCUPANCIES WHICH REQUIRE APPROVED SPRINKLER SYSTEMS DEFINED IN THE INTERNATIONAL FIRE CODE, CALIFORNIA FIRE CODE OR BARSTOW FIRE PROTECTION DISTRICT ORDINANCE WILL ADHERE TO THE STANDARD.**

**Three) sets of plans are required. One for the file, two approved sets for the site.**

Before bidding a project, call the Fire District for specific details. Access, fire flow and square footage may cause the sprinkler requirements to be altered. System shall be installed as per applicable UL, NFPA and IFC and CFC requirements.

**BACK FLOW PREVENTER – IF REQUIRED**

- (a). May not be installed in crawl spaces or other similar areas of difficult access
- (b). Must be installed with at least 4" clearance from wall or other obstructions for testing and service access.

**PIPING.**

All piping shall be listed and installed in accordance with UL or Factory Mutual listing.

**WATER SUPPLY LINE.**

- (a.) The minimum combination domestic/fire supply line and meter for a two-head design system is **1 ½" I.D.** of approved material. For a four-head design system a **2"** supply line and meter is required. NFPA 13 systems will require a minimum **4" supply line**, unless the contractor can demonstrate that a smaller line will provide the design flow requirements.
- (b.) The backflow preventer shall match the supply line in size.
- (c.) The supply lines shall be flushed for a period of time to ensure that debris that would clog sprinklers is removed.
- (d.) There shall be **NO valve** (unless it is an approved indicating valve that can be locked in the open position or electrically monitored) between the meter and the back flow preventer on the fire sprinkler supply line.
- (e.) It is highly recommended that if irrigation supply is tapped before the fire sprinkler system an automatic shut off valve is required to prevent reduction of supply to the sprinklers when irrigation is operating.

**SPRINKLER COVERAGE ADDITIONS.**

Covered decks with gas plumbed for open flame cooking units shall be protected with side-wall heads.

**TESTING.**

- (a). Hydraulic pressure test. A 200-psi test is required for systems with an FDC. This test shall be conducted in accordance with NFPA 13. Sprinkler contractor must remain in attendance for safety reasons when this test is underway. A Fire inspector shall witness the test.
- (b). A 175-psi hydraulic pressure test is required for systems without an FDC; this test is to be run for 1hour with the sprinkler contractor in attendance. A Fire inspector shall witness the test.
- (b). Flow test. A flow test with a marked container of ½ gallon increments (no more than 4 gallons) is required. The sprinkler contractor shall install an inline pressure gauge downstream from the remote heads for the testing inspector to view. A Fire inspector shall witness the test. A pressure gauge shall be installed at the test location. The gauge shall read in **5 PSI** increments and shall register no higher than 150 psig.
- (c). Final inspection. The final inspection will show the system in service. All alarms are required to be in service. The alarm company will be present if the system is monitored OR if the alarm system is a low voltage type with special keypad reset. A fire inspector shall witness the test.

Barstow Fire Protection District	Standard #	BAR 14	Standard <b>BAR14</b>
861 Barstow Road	Description:	Residential Sprinkler System	
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**

Barstow, California  
Residential Sprinkler - Standard

2 of 2

**CONTROLS.**

Control valves inside the house shall be either electrically monitored or locked in the open position. Removal of the DCVA (backflow preventer) valve handles in the "open" position is also acceptable. **No globe valves are allowed.**

**DRAIN REQUIREMENTS.**

(a). The drain pipe and size shall conform to NFPA requirements. Drains must be plumbed. Hose bibs are not allowed.

(b). The drain (if plumbed to an acceptable inside drain) shall be so designed to handle the full flow capacity of the sprinkler system test valve.

(c). Drains shall be plumbed and routed to the outside when possible and shall not cause landscape damage or soil erosion.

**OPERATION/MAINTENANCE.**

(a). The fire sprinkler system, shall be maintained in service and in good working order by the owner for the life of the building.

(b). The installer shall provide operation, maintenance and testing information to the owner.

**WATER FLOW ALARM.**

(a). The sprinkler system shall have installed a means of notification of a water flow event.

(b). EXTERIOR: An exterior grade approved bell or equivalent shall be installed. This shall be above the FDC if one is present.

(d). UL DIALER MONITORING: When required the sprinklers shall send an automatic signal of water flow via an approved UL listed automatic dialer to an approved alarm monitoring company. The final tests are necessary for the issuance of the certificate of occupancy. **The plan review and final tests by the Fire Prevention Bureau do not exclusively constitute permission to occupy.**

Barstow Fire Protection District	Standard #	BAR 14	Standard <b>BAR14</b>
861 Barstow Road	Description:	Residential Sprinkler System	
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**

Barstow, California

Fire Sprinkler Systems – Standpipe Systems – FDC –PIV Locations – Underground Pipe Standards – General

Referenced Sources:

- NFPA 13 Sprinkler System, NFPA 13D Sprinkler Systems Dwellings, NFPA 13R Sprinkler Systems Residential Occupancies up to and including four stories, NFPA 14 Standpipe and Hose Service, International Fire Code, 2015 Edition, International Building Code, 2015 Edition, California Fire Code 2016 Edition.

A permit shall be obtained from the appropriate jurisdiction to include correct building address as well as property owner's name and address.

Plans and Hydraulic Calculations

The information required on plans and hydraulic calculations shall include items specified in NFPA 13 Sections 8-1 and 8-3. Typical sections or elevations, riser diagram, and hanger details shall be included. A minimum of three (3) sets of plans and calculations shall be provided for review.

**A written scope of work** shall be submitted with the plans. If there is no written scope of work, plans will not be accepted. If hydraulic calculations are required, calculations shall be provided for each riser.

Cut sheets shall be provided for all system devices.

Sprinkler plans, hydraulic calculations, and check lists shall bear the stamp of a currently licensed sprinkler contractor or system engineer.

Design Criteria

Underground Supply: Underground piping supplying a sprinkler system, FDC's etc., shall be installed in accordance with NFPA 13. All materials shall be UL listed and/or FM approved for the use intended. Thrust blocking shall be provided per standard. The installer shall be licensed by the State of California for this purpose.

Fire Department Connection (FDC): Fire department hose connection shall be located as noted on the approved plans. The installation of Fire Department Connections shall be in accordance with the following:

FDC's shall be located not less than 18 inches or more than 120 inches from the finished edge of a fire lane. OR AT AN APPROVED LOCATION.

The inlet ports of the FDC shall face the fire lane.

The height of the inlet ports shall not be less than 18 inches or more than 36 inches above the road surface of the fire lane.

All inlet ports shall be equipped with the approved covers or caps.

FDC's shall be located not more than 50 feet from a fire hydrant and both the FDC and hydrant shall be located on the same side of the fire lane when ever possible and shall be approved by the Fire Prevention Bureau.

Barstow Fire Protection District	Standard #	BAR 15	Standard <b>BAR 15</b>
861 Barstow Road	Description:	Sprinkler/Standpipe FDC/PIV & Underground Standard	
Barstow, California 92311			
(760) 256-2254	Revised:	12/2016	

**Barstow Fire Protection District**

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Barstow, California

Fire Sprinkler Systems – Standpipe Systems – FDC –PIV Locations – Underground Pipe Standards – General

FDC's serving sprinkler systems shall:

Not be located on any wall of the building, unless otherwise approved by the Fire Prevention Bureau.

FDC's serving Class I or II standpipes may be located on building wall of fire resistive or non-combustible construction.

All FDC's shall be identified as to type of system served, the building and area served.

For hydraulically designed sprinkler systems with a system demand of 1,000 gpm or more, a minimum of three 2 ½ inch inlet ports shall be required.

The check valve in the FDC supply line shall be installed in an approved location with adequate access for inspection and maintenance or the valve may be installed inside the building.

The piping between the check valve and the outside hose coupling (FDC) shall be equipped with an approved automatic drip located at the lowest point and provided with adequate drainage.

Riser main drains shall be routed to the outside unless floor drains are specifically designed to accommodate test drain flows with valve wide open.

Post Indicator Valve: Sprinkler system supply shall be connected to and controlled by a listed post indicator valve.

**Standpipe System**

Standpipes will be installed as required in the International Fire Code and the International Building Code. Standpipe installations beyond these code requirements may be imposed by the Fire District.

Where standpipes are installed, all areas of the building shall be reached by extending 200 ft. of hose from the nearest standpipe outlet. Partitions and doorways shall be considered in establishing the pathway.

All standpipes systems shall be calculated back to the Fire Department Connection to determine Fire Department Pressure and flow requirements.

Standpipe hose outlets shall be located on the intermediate landing between floors unless otherwise directed by the Fire Marshal or his designees.

One and Two Family Dwellings and Manufactured Homes (per NFPA 13D except as noted below): Sprinklers shall protect all foyers.

All storage spaces beneath stairways shall be sprinkled.

A dry pendent or dry sidewall head shall be installed in the garage close to the entry door to the dwelling. All areas of a garage directly below living areas shall be sprinkled using ordinary hazard

Barstow Fire Protection District	Standard #	BAR 15	Standard <b>BAR 15</b>
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**Barstow Fire Protection District**

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Barstow, California

Fire Sprinkler Systems – Standpipe Systems – FDC –PIV Locations – Underground Pipe Standards – General

Group 1 Standards.

The sprinkler riser and associated equipment shall be located in a heated enclosure when installed in a garage or other unheated areas.

Any dwelling with a gross floor area in excess of 5,000 square feet shall be sprinkled in accordance with NFPA 13D, including calculation up to a maximum of four heads. The design density shall be a minimum of .05 gpm/sq. ft.

Any dwelling with a gross floor area in excess of 5,000 square feet shall be sprinkled in accordance with NFPA 13 unless exceptions are allowed by the AHJ.

Residential Occupancies up to and including four stories in height (per NFPA 13R except as noted below):

All closets, rooms and storage spaces beneath stairways shall be sprinkled.

Sprinklers are required for all covered (roofed) attached porches.

Sprinkler protection is required below balconies or decks extending six or more feet out from building walls.

Sprinklers are required below balconies or decks connected to three or more building walls.

Garages and storage areas shall be protect by Ordinary Group 1 Hazard calculated sprinkler systems.

Commercial Buildings (NFPA 13) except as noted below:

Buildings that exceed a gross area of 5,000 square feet shall have a control valve and water flow indicator for each floor.

Warehouse storage areas must be identified on drawings providing the following design criteria:

- a. Commodity Class
- b. Storage height
- c. Rack configuration
- d. Space between the racks
- e. Encapsulation (if any) of stored commodities
- f. Size and temperature rating if ceiling and in-rack heads
- g. Calculated density/area criteria

Unless approved by the Fire District, use of fixed automatic extinguishing systems (carbon dioxide, FM 200, etc.) are not acceptable in lieu of sprinklers.

Risers shall be located in a separate room from the general occupancy.

Class I hose outlets are required in all covered garage parking levels. Hose outlets shall be located so that all areas of the garage can be reached with 200 feet of hose.

Barstow Fire Protection District	Standard #	BAR 15	Standard <b>BAR 15</b>
861 Barstow Road	Description:	Sprinkler/Standpipe	
Barstow, California 92311		FDC/PIV & Underground Standard	
(760) 256-2254	Revised:	12/2016	

**Barstow Fire Protection District**

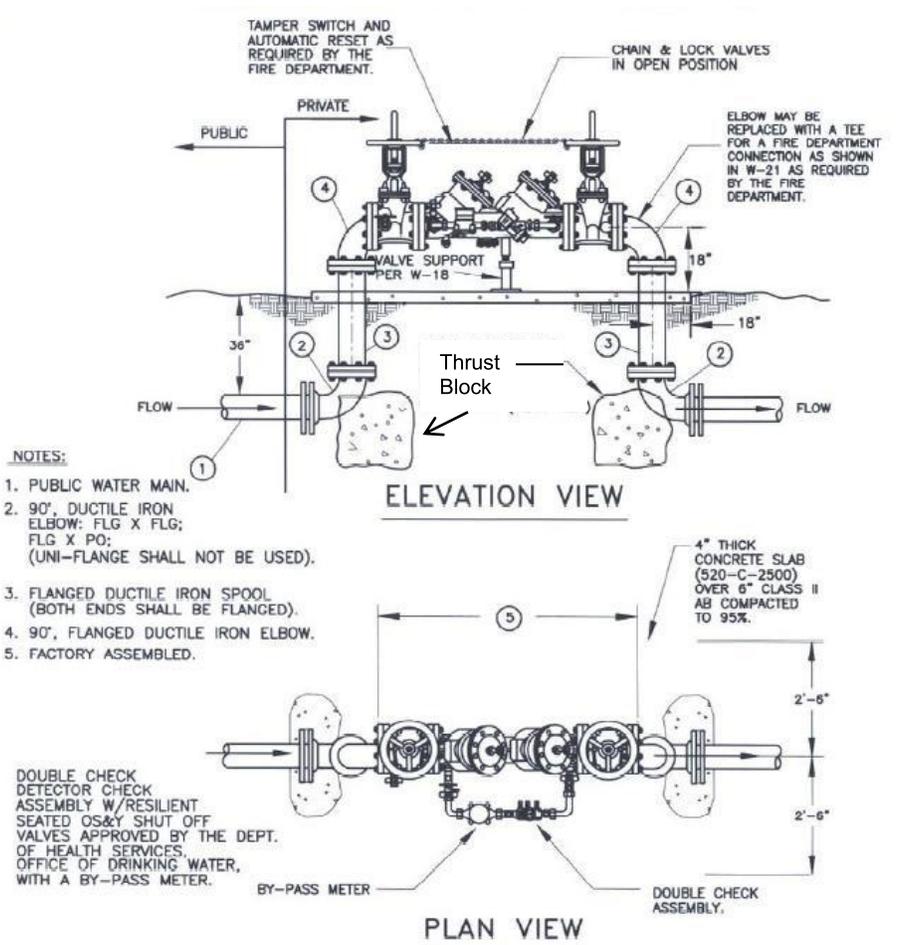
Barstow, California

Fire Sprinkler Systems – Standpipe Systems – FDC –PIV Locations – Underground Pipe Standards – General

Residential sprinklers designed in accordance with NFPA 13 shall achieve a minimum density of 0.10 gpm/sq. feet over the remote area, in addition to satisfying their listed spacing criteria. The remote area is determined by calculating the four (4) most hydraulically remote heads regardless of partition locations.

Standard Drawing:

Back Flow Preventor, (OS&Y)



Barstow Fire Protection District	Standard #	BAR 15
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Standard  
**BAR 15**

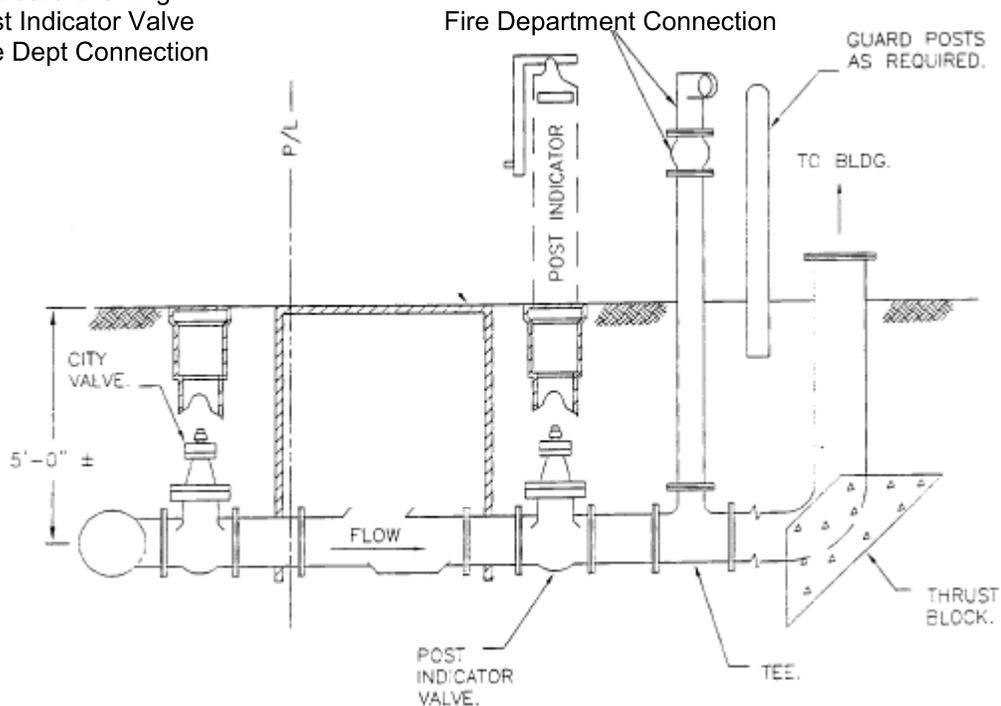
Attachment: BFPD Standards Fire Ord 29 (5525 : Ordinance No.30-2023 Adoption of and Amendment to the 2022 California Fire

**Barstow Fire Protection District**

Barstow, California

Fire Sprinkler Systems – Standpipe Systems – FDC –PIV Locations – Underground Pipe Standards – General

Standard Drawing  
Post Indicator Valve  
Fire Dept Connection



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**BAR 15**

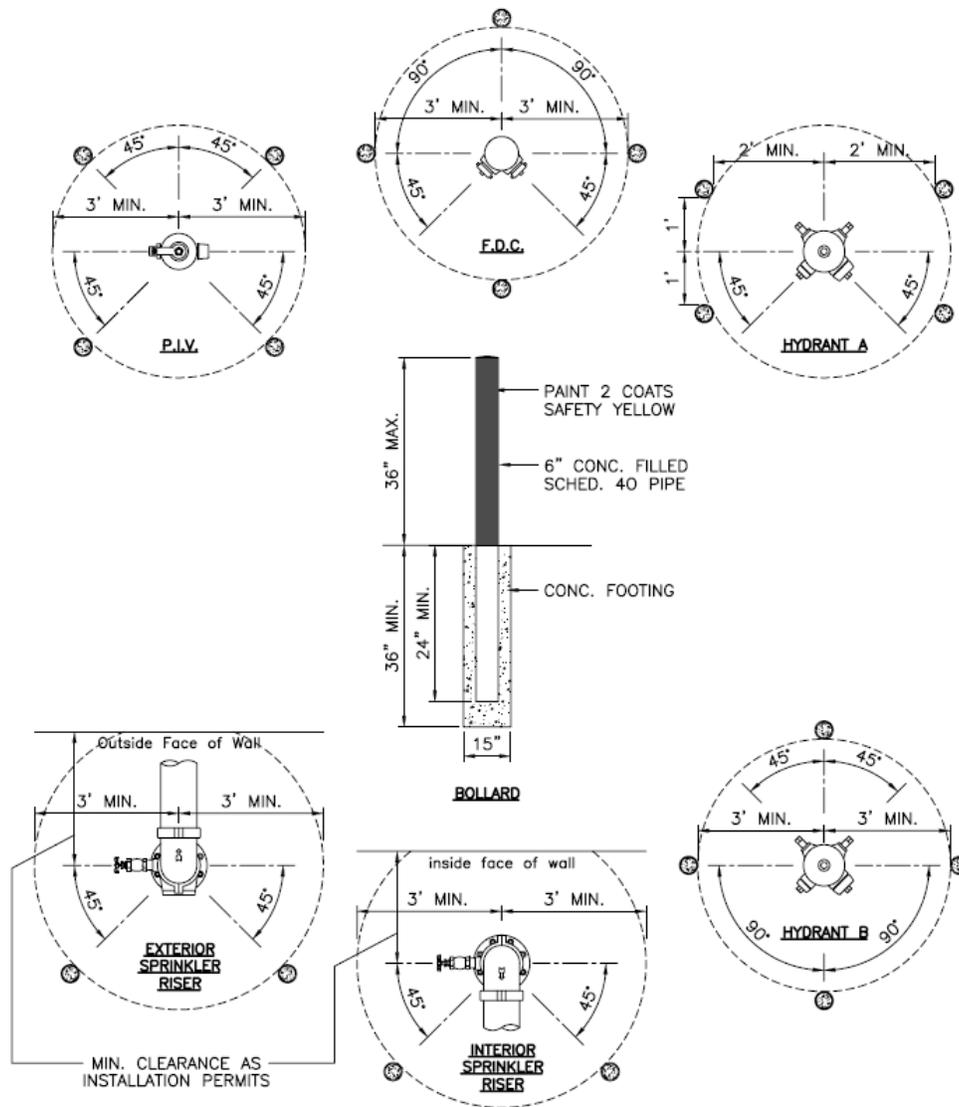
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**Barstow Fire Protection District**

Barstow, California

Fire Sprinkler Systems – Standpipe Systems – FDC –PIV Locations – Underground Pipe Standards – General

Standard Drawing  
Protection and Clearance Distances



Barstow Fire Protection District	Standard #	BAR 15
861 Barstow Road	Description:	Sprinkler/Standpipe
Barstow, California 92311		FDC/PIV &
		Underground Standard
(760) 256-2254	Revised:	12/2016

Standard  
**BAR 15**

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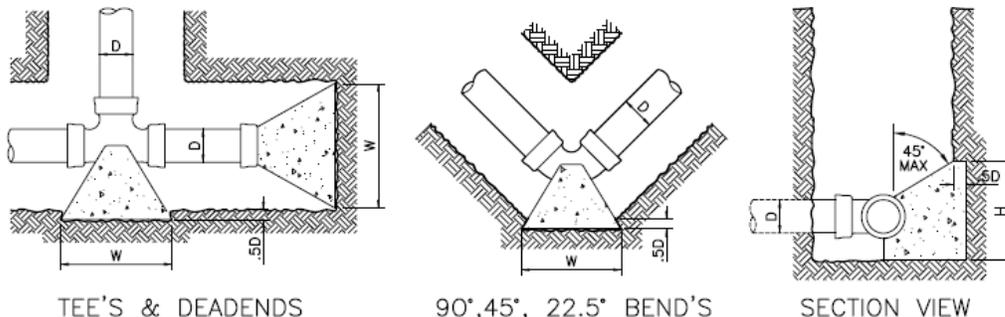
**Barstow Fire Protection District**

Barstow, California

Fire Sprinkler Systems – Standpipe Systems – FDC –PIV Locations – Underground Pipe Standards – General

Standard Drawing

Thrust Blocks for Underground Fire Protection Systems



TEE'S & DEADENDS

90°, 45°, 22.5° BEND'S

SECTION VIEW

MINIMUM THRUST BLOCK BEARING AREA PER NFPA 24 2002 EDITION

SECTION A-10.8.2, WHERE:  $A_b$  = BEARING AREA (sqft)  
 $S_f$  = SAFETY FACTOR (1.5)  $T_a$  = ADJUSTED THRUST FORCE (lbs) USING FORMULA:  $A_b = \frac{T_a(S_f)}{S_b}$   
 $S_b$  = SOIL BEARING STRENGTH (lb/sqft)  $T$  = HYDROSTATIC TEST PRESSURE

PIPE SIZE	TEE'S & DEADEND'S	90° HORIZONTAL BEND	45° HORIZONTAL BEND	22.5° HORIZONTAL BEND				
	ADJUSTED THRUST FORCE PER TABLE A-10-8.2a $T_a = T(P) / 100$	ADJUSTED THRUST FORCE PER TABLE A-10-8.2a $T_a = T(P) / 100$	ADJUSTED THRUST FORCE PER TABLE A-10-8.2a $T_a = T(P) / 100$	ADJUSTED THRUST FORCE PER TABLE A-10-8.2a $T_a = T(P) / 100$				
4"	1,810(200)/100 = 3,620 lbs	2,559(200)/100 = 5,118 lbs	1,385(200)/100 = 2,770 lbs	706(200)/100 = 1,412 lbs				
6"	3,739(200)/100 = 7,478 lbs	5,288(200)/100 = 10,576 lbs	2,862(200)/100 = 5,724 lbs	1,459(200)/100 = 2,918 lbs				
8"	6,433(200)/100 = 12,866 lbs	9,097(200)/100 = 18,194 lbs	4,923(200)/100 = 9,846 lbs	2,510(200)/100 = 5,020 lbs				
10"	9,677(200)/100 = 19,354 lbs	13,685(200)/100 = 27,370 lbs	7,406(200)/100 = 14,812 lbs	3,776(200)/100 = 7,552 lbs				
12"	13,685(200)/100 = 27,370 lbs	19,353(200)/100 = 38,706 lbs	10,474(200)/100 = 20,948 lbs	5,340(200)/100 = 10,680 lbs				
PIPE SIZE	BEARING AREA AREA / DIMENSION		BEARING AREA AREA / DIMENSION		BEARING AREA AREA / DIMENSION		BEARING AREA AREA / DIMENSION	
	SQFT	W x H	SQFT	W x H	SQFT	W x H	SQFT	W x H
4"	5.5'	2.5' x 2.2'	7.6	3' x 2.53'	4.2'	2.33' x 1.83'	2.2'	1.58' x 1.4'
6"	11.3'	3.75' x 3.1'	16'	4.25' x 3.76'	8.6'	3.25' x 2.64'	4.4'	3' x 2.64'
8"	19.5'	4.75' x 4.1'	27.3'	5.5' x 4.96'	14.8'	4' x 3.7'	7.6'	3' x 2.53'
10"	29.3'	5.75' x 5.1'	41.1'	5.75' x 5.1'	22.2'	5' x 4.45'	11.4	3.75' x 3.04'
12"	41.1'	6.75' x 6.1''	58'	7.75' x 7.48'	31.4'	6' x 5.23'	16	4.25' x 3.76'

NOTES

1. THE BEARING AREA DIMENSIONS SHALL BE SUCH THAT THE WIDTH OF THE THRUST BLOCK BEARING FACE SHALL BE AT LEAST ONE TO ONE AND ONE-HALF TIMES THE HEIGHT.
2. THRUST BLOCK BEARING AREAS ARE BASED ON 200 PSI TEST PRESSURE AND 1,000 PSF OF ALLOWABLE SOIL PRESSURE WITH 30" OF COVER MINIMUM. ACTUAL SOIL PRESSURES MAY BE SUBSTITUTED FOR THE ABOVE CHART AND BEARING AREAS REDUCED ACCORDINGLY, PROVIDED THAT A CERTIFIED COPY OF THE SOILS REPORT IS INCLUDED WITH THE PLANS.
3. THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL, APPROVED COMPACTED BACKFILL AND/OR CLASS 100-E-100 SLURRY.
4. CONCRETE MIXTURE USED FOR THRUST BLOCKS SHALL NOT BE LEANER THAN ONE PART CEMENT, TWO AND ONE-HALF PARTS SAND, AND FIVE PARTS ABC STONE WITH A MINIMUM CURING PERIOD OF FIVE DAYS (28 DAY/2000 PSI CONCRETE)
5. WHERE FERROUS PIPE AND FITTINGS ARE TO BE INSTALLED, POLYETHYLENE ENCASMENT SHALL BE IN PLACE PRIOR TO FORMING AND POURING THRUST BLOCKS. ALL FITTING BOLTS ASSEMBLIES SHALL REMAIN CLEAR OF CONCRETE DURING POUR.

Barstow Fire Protection District	Standard #	BAR 15
861 Barstow Road	Description:	Sprinkler/Standpipe FDC/PIV & Underground Standard
Barstow, California 92311		
(760) 256-2254	Revised:	12/2016

Standard  
**BAR 15**

Attachment: BFPD Standards Fire Ord 29 (5525 : Ordinance No.30-2023 Adoption of and Amendment to the 2022 California Fire

**Barstow Fire Protection District**  
 Barstow, California  
 Hot Work and Welding Operations - Standard

1 of 8

Definition. "Hot work" means riveting, welding, flame cutting or other fire or spark-producing operation.

Hot work in confined spaces. Hot work shall not be performed in a confined space until a designated person has tested the atmosphere and determined that it is not hazardous.

Fire protection.

To the extent possible, hot work shall be performed in designated locations that are free of hazards. When hot work must be performed in a location that is not free of hazards, all necessary precautions shall be taken to confine heat, sparks, and slag so that they cannot contact flammable or combustible material. Fire extinguishing equipment suitable for the location shall be immediately available and shall be maintained in readiness for use at all times.

When the hot work operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire during hot work and for a sufficient time after completion of the work to ensure that no fire hazard remains. The employer shall instruct all employees involved in hot work operations as to potential fire hazards and the use of firefighting equipment.

Drums and containers which contain or have contained flammable or combustible liquids shall be kept closed. Empty containers shall be removed from the hot work area.

When openings or cracks in flooring cannot be closed, precautions shall be taken to ensure that no employees or flammable or combustible materials on the floor below are exposed to sparks dropping through the floor. Similar precautions shall be taken regarding cracks or holes in walls, open doorways and open or broken windows.

Hot work shall not be performed:

In flammable or Potentially flammable atmospheres:

On or in equipment or tanks that have contained flammable gas or liquid or combustible liquid or dust-producing material, until a designated person has tested the atmosphere inside the equipment or tanks and determined that it is not hazardous; or

Near any area in which exposed readily ignitable materials such as bulk sulphur, baled paper or cotton stored. Bulk sulphur is excluded from this prohibition if suitable precautions are followed, the person in charge is knowledgeable and the person performing the work has been instructed in preventing and extinguishing sulphur fires.

Drums, containers or hollow structures that have contained flammable or combustible substances shall either be filled with water or cleaned, and shall then be ventilated. A designated person shall test the atmosphere and determine that it is not hazardous before hot work is performed on or in such structures.

Barstow Fire Protection District	Standard #	BAR 16	Standard <b>BAR16</b>
861 Barstow Road	Description:	HOT WORK & WELDING	
Barstow, California 92311			
(760) 256-2254	Revised:	01/2014	

**Barstow Fire Protection District**  
 Barstow, California  
 Hot Work and Welding Operations - Standard

2 of 8

Before heat is applied to a drum, container or hollow structure, an opening to release built-up pressure during heat application shall be provided.

Gas welding and cutting.

Compressed gas cylinders:

Shall have valve protection caps in place except when in use, hooked up or secured for movement. Oil shall not be used to lubricate caps;

Shall be hoisted only while secured, as on a cradle or pallet, and shall not be hoisted by mallet, choker sling or cylinder caps;

Shall be moved only by tilting or rolling on their bottom edges;

Shall be secured when moved by vehicle;

Shall be secured while in use;

Shall have valves closed when cylinders are empty, being moved or stored;

Shall be secured upright except when hoisted or carried;

Shall not be freed when frozen by prying the valves or caps with bars or by hitting the valve with a tool;

Shall not be thawed by boiling water;

Shall not be exposed to spark, hot slag, or flame;

Shall not be permitted to become part of electrical circuits or have electrodes struck against them to strike arcs;

Shall not be used as rollers or supports;

Shall not have contents used for purposes not authorized by the supplier;

Shall not be used if damaged or defective;

Shall not have gases mixed within, except by gas suppliers;

Shall be stored so that oxygen cylinders are separated from fuel gas cylinders and combustible materials by either a minimum distance of 20 feet (6.1 m) or a barrier having a fire-resistance rating of 30 minutes; and

Shall not have objects that might either damage the safety device or obstruct the valve placed on top of the cylinder when in use.

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Use of fuel gas. Fuel gas shall be used only as follows:

Before regulators are connected to cylinder valves, the valves shall be opened slightly (cracked) and closed immediately to clear away dust or dirt. Valves shall not be cracked if gas could reach possible sources of ignition;

Cylinder valves shall be opened slowly to prevent regulator damage and shall not be opened more than 1 1/2 turns. Any special wrench required for emergency closing shall be positioned on the valve stem during cylinder use. For manifolded or Coupled cylinders, at least one wrench shall be immediately available. Nothing shall be placed on top of a cylinder or associated parts when the cylinder is in use.

Pressure-reducing regulators shall be attached to cylinder valves when cylinders are supplying torches or devices equipped with shut-off valves;

Cylinder valves shall be closed and gas released from the regulator or manifold before regulators are removed;

Leaking fuel gas cylinder valves shall be closed and the gland nut tightened. If the leak continues, the cylinder shall be tagged, removed from service, and moved to a location where the leak will not be hazardous. If a regulator attached to a valve stops a leak, the cylinder need not be removed from the workplace but shall be tagged and may not be used again before it is repaired; and

If a plug or safety device leaks, the cylinder shall be tagged, removed from service, and moved to a location where the leak will not be hazardous.

Hose.

Fuel gas and oxygen hoses shall be easily distinguishable from each other by color or sense of touch. Oxygen and fuel hoses shall not be interchangeable. Hoses having more than one gas passage shall not be used.

When oxygen and fuel gas hoses are taped together, not more than four (4) of each 12 inches (10.16 cm of each 30.48 cm) shall be taped.

Hose shall be inspected before use. Hose subjected to flashback or showing evidence of severe wear or damage shall be tested to twice the normal working pressure but not less than 200 p.s.i. (1378.96 kPa) before reuse. Defective hose shall not be used.

Hose coupling shall not unlock or disconnect without rotary motion.

Hose connections shall be clamped or securely fastened to withstand twice the normal working pressure but not less than 300 p.s.i. (2068.44 kPa) without leaking.

Gas hose storage boxes shall be ventilated.

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Torches.

Torch tip openings shall only be cleaned with devices designed for that purpose.

Torches shall be inspected before each use for leaking shut-off valves, hose couplings and tip connections. Torches with such defects shall not be used.

Torches shall not be lighted from matches, cigarette lighters, other flames or hot work.

Pressure regulatory. Pressure regulators, including associated gauges, shall be maintained in safe working order.

Operational precaution. Gas welding equipment shall be maintained free of oil and grease.

Arc welding and cutting.

Manual electrode holders.

The employer shall ensure that only manual electrode holders intended for arc welding and cutting and capable of handling the maximum current required for such welding or cutting shall be used.

Current-carrying parts passing through those portions of the holder gripped by the user and through the outer surfaces of the jaws of the holder shall be insulated against the maximum voltage to ground.

Welding cables and connectors.

Arc welding and cutting cables shall insulated, flexible and capable of handling the maximum current required by the operations, taking into account the duty cycles.

Only cable free from repair or splice for 10 feet (3 m) from the electrode holder shall be used unless insulated connectors or splices with insulating quality equal to that of the cable are provided.

When a cable other than the lead mentioned in paragraph (e)(2)(ii) of this section wears and exposes bare conductors, the portion exposed shall not be used until it is protected by insulation equivalent in performance capacity to the original.

Insulated connectors of equivalent capacity shall be used for connecting or splicing cable. Cable lugs, where used as connectors, shall provide electrical contact. Exposed metal parts shall be insulated.

Ground returns and machine grounding.

Ground return cables shall have current-carrying capacity equal to or exceeding the total maximum output capacities of the welding or cutting units served.

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Structures or pipelines, other than those containing gases or flammable liquids or conduits containing electrical circuits, may be used in the ground return circuit if their current-carrying capacity equals or exceeds the total maximum output capacities of the welding or cutting units served.

Structures or pipelines forming a temporary ground return circuit shall have electrical contact at all joints. Arcs, sparks or heat at any point in the circuit shall cause rejection as a ground circuit.

Structures or pipelines acting continuously as ground return circuits shall have joints bonded and maintained to ensure that no electrolysis or fire hazard exists.

Arc welding and cutting machine frames shall be grounded, either through a third wire in the cable containing the circuit conductor or through a separate wire at the source of the current. Grounding circuits shall have resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

Ground connections shall be mechanically and electrically adequate to carry the current.

When electrode holders are left unattended, electrodes shall be removed and holders placed to prevent employee injury.

Hot electrode holders shall not be dipped in water.

The employer shall ensure that when arc welders or cutters leave or stop work or when machines are moved, the power supply switch shall be kept in the off position.

Arc welding or cutting equipment having a functional defect shall not be used.

Arc welding and cutting operations shall be separated from other operations by shields, screens, or curtains to protect employees in the vicinity from the direct rays and sparks of the arc.

Employees in areas not protected from the arc by screening shall be protected by appropriate filter lenses in accordance with paragraph (h) of this section. When welders are exposed to their own arc or to each other's arc, they shall wear filter lenses complying with the requirement of paragraph (h) of this section.

The control apparatus of arc welding machines shall be enclosed, except for operating wheels, levers, and handles.

Input power terminals, tap change devices and live metal parts connected to input circuits shall be enclosed and accessible only by means of insulated tools.

When arc welding is performed in wet or high-humidity conditions, employees shall use additional protection, such as rubber pads or boots, against electric shock.

Ventilation and employee protection in welding, cutting and heating.

Mechanical ventilation requirements. The employer shall ensure that general mechanical ventilation or local exhaust systems shall meet the following requirements:

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General mechanical ventilation shall maintain vapors, fumes and smoke below a hazardous level.

Local exhaust ventilation shall consist of movable hoods positioned close to the work and shall be of such capacity and arrangement as to keep breathing zone concentrations below hazardous levels.

Exhausts from working spaces shall be discharged into the open air, clear of intake air sources;

Replacement air shall be clean and respirable; and

Oxygen shall not be used for ventilation, cooling or cleaning clothing or work areas.

Hot work in confined spaces. Except as specified in paragraphs (f)(3)(ii) and (f)(3)(iii) of this section, when hot work is performed in a confined space the employer shall ensure that:

General mechanical or local exhaust ventilations shall be provided; or

Employees in the space shall wear supplied air respirators in accordance with 1910.134 and a standby on the outside shall maintain communication with employees inside the space and shall be equipped and prepared to provide emergency aid.

Welding, cutting or heating of toxic metals.

In confined or enclosed spaces, hot work involving the following metals shall only be performed with general mechanical or local exhaust ventilation that ensures that employees are not exposed to hazardous levels of fumes:

Lead base metals;

Cadmium-bearing filler materials; and

Chromium-bearing metals or metals coated with Chromium-bearing materials.

In confined or enclosed spaces, hot work involving the following metals shall only be performed with local exhaust ventilation meeting the requirement of paragraph (f)(1) of this section or by employees wearing supplied air respirators in accordance with 1910.134;

Zinc-bearing base or filler metals or metals coated with zinc-bearing materials;

Metals containing lead other than as an impurity, or coated with lead-bearing materials;

Cadmium-bearing or cadmium-coated base metals; and

Metals coated with mercury-bearing materials.

Employees performing hot work in confined or enclosed spaces involving beryllium-containing base or filler metals shall be protected by local exhaust ventilation and wear supplied air respirators or self-contained breathing apparatus, in accordance with the requirement of 1910.134.

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The employer shall ensure that employees performing hot work in the open air that involves any of the metals listed in paragraphs (f)(3)(i) and (f)(3)(ii) of this section shall be protected by respirators in accordance with the requirement of 1910.134, and those working on beryllium-containing base or filler metals shall be protected by supplied air respirators, in accordance with the requirements of 1910.134.

Any employee exposed to the same atmosphere as the welder or burner shall be protected by the same type of respiratory and other protective equipment as that worn by the welder or burner.

Inert-gas metal-arc welding. Employees shall not engage in and shall not be exposed to the inert-gas metal, welding process unless the following precautions are taken:

Chlorinated solvents shall not be used within 200 feet (61 m) of the exposed arc. Surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is performed on them.

Employees in areas not protected from the arc by screening shall be protected by appropriate filter lenses in accordance with the requirement of paragraph (h) of this section. When welders are exposed to their own arc or to each other's arc, filter lenses complying with the requirements of paragraph (h) of this section shall be worn to protect against flashes and radiant energy.

Employees exposed to radiation shall have their skin covered completely to prevent ultraviolet burns and damage. Helmets and hand shields shall not have leaks, openings or highly reflective surfaces.

Inert-gas metal-arc welding on stainless steel shall not be performed unless exposed employees are protected either by local exhaust ventilation or by wearing supplied air respirators.

Welding, cutting and heating on preservative coatings.

Before hot work is commenced on surfaces covered by a preservative coating of unknown flammability, a test shall be made by a designated person to determine the coating's flammability. Preservative coatings shall be considered highly flammable when scrapings burn with extreme rapidity.

Appropriate precaution shall be taken to prevent ignition of highly flammable hardened preservative coatings. Highly flammable coatings shall be stripped from the area to be heated. An uncoiled fire hose with fog nozzle, under pressure, shall be immediately available in the hot work area.

Surfaces covered with preservative coatings shall be stripped for at least 4 inches (10.16 cm) from the area of heat application or employees shall be protected by supplied air respirators in accordance with the requirements of § 1910.134 of this chapter.

Protection against radiant energy.

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Employees shall be protected from radiant energy eye hazards by spectacles, cup goggles, helmets, hand shields or face shields with filter lenses complying with the requirements of this paragraph.

Filter lenses shall have an appropriate shade number, as indicated in Table G-1, for the work performed. Variations of one or two shade numbers are permissible to suit individual preferences.

If filter lenses are used in goggles worn under the helmet, the shade numbers of both lenses equals the value shown in Table G-1 for the operation.

TABLE - FILTER LENSES FOR PROTECTION  
AGAINST RADIANT ENERGY

Operation	Shade No.
Soldering.....	2.
Torch Brazing.....	3 or 4.
Light cutting, up to 1 inch....	3 or 4.
Medium cutting, 1-6 inches	4 or 5.
Heavy cutting, over 6 inches.....	5 or 6.
Light gas welding, up to 1/8..... inch.	4 or 5.
Medium gas welding, 1/8 - 1/2 inch.	5 or 6.
Heavy gas welding, over 1/2 inch.	6 or 8.
Shielded Metal-Arc Welding 1/16 to 5/32 - inch electrodes.	10.
Inert-gas Metal-Arc Welding (Non-ferrous) 1/16 - to 5/32 - inch electrodes.	11.
Shielded Metal-Arc Welding: 3/16 to 1/4 - inch electrodes.....	12.
5/16 - and 3/8 - inch electrodes..	14

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**MODEL ROCKET STANDARD**

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**High power rocketry is prohibited within the jurisdiction of the Barstow Fire Protection District.**

**STORAGE, SALE AND USE**

The storage, sale, and use of model rocket motors shall comply with the requirements of CCR Title 19, Chapter 6, Article 17, NFPA 1122, Health and Safety Code Section 12552, and all appropriate local, city, county ordinances, and regulations.

No model rocket motors shall be sold, given, or delivered to any person under 18 years of age.

Exception: model rocket motors bearing the standardized coding 1/4A, 1/2A, A, B, C, and D may be sold, given, or delivered to any person 14 years of age or older.

Persons who are 12 years of age or older and who are taking part in a model rocket education program may receive model rocket motors and launch approved model rocket motors when under the direct supervision and control of a person 18 years of age or older. Model rocket motors must be obtained only from the adult in charge of the launching. Approved model rocket motors for this exception shall bear the motor coding 1/4A, 1/2A, A, B, C, or D.

Any facility storing and selling model rocket motors shall comply with all of the above and shall place a legible, visible, permanent sign at the register stating, **“MODEL ROCKET MOTORS WILL NOT BE SOLD, GIVEN, OR DELIVERED TO ANYONE UNDER 18 YEARS OF AGE.”**

For permitting purposes, the retailer shall provide the Barstow Fire Protection District the following information:

- Brand and size/type of model rocket motors
- Material safety data sheets on all types and brands of rocket motors
- Total quantity/number of model rockets to be stored including the total weight of the product to be stored

**PERMIT**

A valid permit is required from the Barstow Fire Protection District to store or sell model rocket motors at a retail level, and to fire/launch a model rocket within the jurisdiction of the Barstow Fire Protection District. Maximum motor size permitted is “D”.

Persons applying for a permit to launch model rockets shall provide the following in addition to completing a fire department permit application:

- Name, address, and phone number of person who will be supervising the launching
- A list of the types and sizes of model rockets, which will be used
- A detailed site plan of the launch site shall be provided and show prevailing wind direction, the diameter of the launch site in feet, barriers around launch site, description of the area (asphalt parking lot, school yard with landscaped lawn, open field area, etc.), identify location of spectator area, all buildings, roads, fences, overhead power lines, trees, freeways, fire hydrants, fire department access roads, rocket recovery area. Site plan shall show distance, in feet, between all above items and the launch site.
- Applicant shall secure a letter of permission from the owner of the land/property where the launch site is to be located, giving location, date and time of event.
- Applicant shall comply with all related FAA regulations and obtain any necessary permits for such activity, providing the Barstow Fire Protection District with copies of these documents.

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**MODEL ROCKET STANDARD**

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**MOTORS**

All model rocket motors stored shall be approved, classified and labeled in accordance with CCR Title 19, Chapter 6, Article 17, Section 1021 (a) and (b). ALL MODEL ROCKET MOTORS WHICH DO NOT COMPLY WITH THE ABOVE ARE ILLEGAL AND ARE NOT PERMITTED.

**LAUNCHING**

No spectators shall be permitted within 100 feet of the launching device.

**LAUNCHING FACILITIES**

Launching angle of not less than 60 degrees from the horizontal shall be used. Surface wind shall not exceed 20 miles per hour and vertical visibility must be at least 2,000 feet.

Model rockets may be launched only during daylight hours.

Personnel conducting the firing shall maintain a 10-foot clear distance. Assisting or observing personnel shall maintain a clear distance of 25 feet during countdown and firing.

<b>MINIMUM LAUNCH SITE DIMENSIONS</b>			
<b>Installed Total Impulse (Newton-seconds)</b>	<b>Equivalent Motor Type</b>	<b>Minimum Site Dimensions (feet)</b>	<b>Minimum Site Dimensions (meters)</b>
0 – 1.25	¼ A and ½ A	50	15
1.26 – 2.50	A	100	30
2.51 – 5.00	B	200	61
5.01 – 10.00	C	400	122
10.01 – 20.00	D	500	152

*For a circular area, the minimum launch site dimension is the diameter; for a rectangular area, it is the shortest side.*

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**ABOVEGROUND TANKS - STANDARD**

The installation of protected aboveground tanks, located on the outside of a building or structure, applicable standards of the NFPA, International Fire Code 2015 Edition, California Fire Code 2016 Edition and the Barstow Fire Protection District, Ordinance 28-16.

The purpose of this standard is to provide guidance and instruction for the installation of protected above ground tanks that are located outside of buildings or structures. This standard shall apply to all installations of protected aboveground tanks within the limits of the Jurisdiction of the Barstow Fire Protection District.

**PROTECTED ABOVEGROUND TANK** is a listed *UL 2085* or equivalent tank system consisting of a primary tank provided with protection from physical damage, and fire-resistive protection from a high-intensity liquid pool fire exposure. The tank system is allowed to provide these protection elements as a unit or is allowed to be an assembly of components, or a combination thereof.

**Permits:**

A permit and plan approval are required to install, use, repair or modify protected aboveground tanks that are located on the outside of buildings or structures.

**Installation and site plans:**

Installation and site plans shall be submitted with permit applications. The plans shall include the design, details, and specifications of the following:

- a. Type of protected aboveground tanks and their supports to be used;
- b. Quantities and types of fuel to be stored;
- c. Distances from tanks to property lines and buildings;
- d. Distances between adjacent tanks;
- e. Overfill prevention, spill containment, vents, leak monitoring and other equipment and accessories;
- f. Venting;
- g. Piping and valves;
- h. Electrical systems;
- i. Emergency controls;
- j. Fire department access;
- k. Location of fire appliances;
- l. Vehicle impact protection;
- m. Site security measures;
- n. Other information as required by the Fire District.

**Site Inspection:**

All outside aboveground fuel tank installations shall be visited and physically inspected by personnel from the Fire Marshal's office prior to approval of permits.

**Annual inspections:**

Permitted sites shall be inspected annually to assure compliance with the requirements of this standard and the *Fire Code*.

**Prohibited locations:**

Installation of outside aboveground fuel tanks on top of buildings is prohibited.

**Exception:** Approved Day Tanks of 60 gallons or less capacity.

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**ABOVEGROUND TANKS - STANDARD**

**Locations subject to flooding:**

Where a tank is located in an area that is subject to flooding, uplift protection shall be provided.

**TANK DESIGN**

Protected aboveground tanks shall be listed and labeled to meet the requirements specified for *UL 2085* or equivalent tanks or systems.

**Primary Tanks:**

The design, fabrication and construction of primary tanks shall be in accordance with recognized good engineering practice and nationally recognized standards. Each tank shall bear a permanent nameplate or marking indicating the standard used as the basis of design, fabrication and construction.

Primary tanks shall not exceed a 999 gallon individual or 1999 gallon aggregate capacity without additional mitigation and design features.

**Normal and Emergency Venting:**

Venting for normal and emergency venting for aboveground tanks shall be installed in accordance with the *Fire Code*.

**Capacity:**

The vent capacity reduction factors shall be in accordance with the *Fire Code*.

**Flame-arresters:**

Approved flame-arresters shall be installed in normal vents.

**Projectile Protection:**

When a projectile test is required by the Fire District, the protected tank shall be tested in accordance with the requirements for bullet resistance according to UL of Factory Mutual Standard.

**Exception:** Listed protected aboveground tanks that have projectile protection incorporated into their design and construction.

**INSTALLATION OF TANKS**

The installation of protected aboveground tanks shall be in accordance with the following:

**Separation Distances:**

A protected aboveground tank shall be separated from property lines, important buildings, public ways and other tanks in accordance with the table of this standard.

**Aggregate Capacity:**

Protected aboveground tank installations having the maximum allowable aggregate capacity shall be separated from other installations of protected aboveground tanks by not less than 100 feet.

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**Secondary Containment:**

Protected aboveground tanks shall be provided with drainage control or diking or with secondary containment that is a component of the listed protected aboveground tank. A method of monitoring the secondary containment shall be provided. Enclosed secondary containment shall be provided with emergency venting.

**Vehicle Impact Protection:**

Where aboveground tanks may be subject to vehicular impact, and when required by the Fire District, guard posts or other approved means shall be provided to protect aboveground tanks and connecting piping, valves and fittings.

Where guard posts are installed, the posts shall be:

1. Constructed of a strength equivalent to that of 4-inch diameter Schedule 40 steel pipe and filled with concrete,
2. Spaced not less than 4 feet between posts on center,
3. Set not less than 3 feet deep in a concrete footing of not less than 15-inch diameter,
4. Set with the top of the posts not less than 3 feet above ground, and
5. Located not less than 5 feet from the tank.

**Exception:** Guard post are not required for Listed protected aboveground tanks that have vehicle impact protection incorporated into their design and construction.

**Overfill Protection:**

Protected aboveground tanks shall not be filled in excess of *90 percent* of their capacity. An overfill prevention system shall be provided for each tank. During tank filling operations, the system shall:

1. Provide an independent means of notifying the person filling the tank that the fluid level has reached *85 percent* of tank capacity by providing an audible or visual signal, providing a tank level gauge marked at *85 percent* of tank capacity or other approved means, and
2. Automatically shut off the flow of fuel to the tank when the quantity of liquid in the tank reaches *90 percent* of tank capacity.

For rigid hose fuel-delivery systems, an approved means shall be provided to empty the contents of the filler hose into the tank after the automatic shutoff device is activated. A permanent sign shall be provided at the fill point for the tank to document the filling procedure and the tank calibration chart. The filling procedure shall require the person filling the tank to determine the gallonage required to fill it to *90 percent* of capacity before commencing the filling operation.

**Fill Pipe Connections:**

The fill pipe shall be provided with a means for making a direct connection to the tank vehicle's fuel delivery hose so that the delivery of fuel is not exposed to the open air during the filling operation. When any portion of the fill pipe exterior to the tank extends below the top of the tank, a check valve shall be installed in the pipe not more than 12 inches from the fill hose connection.

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**ABOVEGROUND TANKS - STANDARD**

**Spill Containers:**

A spill container having a capacity of not less than 5 gallons shall be provided for each fill connection. For tanks with a top fill connection, spill containers shall be noncombustible and shall be fixed to the tank and equipped with a manual drain into the primary tank. For tanks with a remote fill connection, a portable spill container shall be provided.

**Warning Signs:**

Warning signs and (NFPA 704 hazard identification signs may be required) to be installed to clearly identify hazards.

ALL Warning signs shall have RED colored lettering on a white background, stating **NO SMOKING, WELDING OR OPEN FLAMES WITHIN 25 FEET**, shall be provided on the sides of tanks, or on security fencing, in the direction of fire department approach. Warning signs and NFPA 704 hazard signs, shall have lettering at least 3 inches in height and of weatherresistive materials.

**Security:**

When required by the Fire District, the storage, dispensing, use and handling areas shall be secured against unauthorized entry and safeguarded with such protective facilities as public safety requires. When security fences are installed, the fences shall be as follows:

1. Substantially built of iron, steel or concrete, fabricated and installed in accordance with the *Building Code*,
2. Not less than 7 feet above the surrounding floor or ground surface, no portion of which shall be less than 6 feet above the surrounding floor or ground surface,
3. Topped by 3 rows of barbed wire, 4 inches apart,
4. Such necessary openings are designed and fabricated to provide security equivalent to the fence,
5. Locked at all times except when in use by authorized personnel,
6. Located not less than 5 feet from the tank, valves or piping.

**Electrical installations:**

All electrical equipment and wiring shall be in accordance with the International *Electrical Code* and listed for intended service.

**PARKING OF TANK VEHICLES**

Tank vehicles shall not be parked within 25 feet of a protected aboveground tank.

**Exception:** When the tank is being filled from the tank vehicle.

**MAINTENANCE**

Protected aboveground tanks and associated piping systems located outside shall be maintained in a safe operating condition. Protected aboveground tanks and components shall be maintained in accordance with their listings. Tanks, valves and piping should be visually inspected monthly for rust, deterioration or leakage.

Damage to listed protected aboveground tanks shall be repaired using materials and methods having equal or greater strength and fire resistance, and shall be in accordance with the manufacture's guidelines or recommendations and the tank's listing. The areas surrounding tanks and their associated piping shall be kept clear of storage, combustible materials, weeds, trash and waste.

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**ABOVEGROUND TANKS - STANDARD**

**MINIMUM SEPARATION REQUIREMENTS FOR  
PROTECTED ABOVE GROUND TANKS**

INDIVIDUAL TANK CAPACITY	MINIMUM DISTANCE FROM PROPERTY LINE WHICH IS OR CAN BE BUILT UPON, INCLUDING THE OPPOSITE SIDE OF A PUBLIC WAY	MINIMUM DISTANCE FROM THE NEAREST SIDE OF ANY PUBLIC WAY OR FROM THE NEAREST IMPORTANT BUILDING ON THE SAME PROPERTY	MINIMUM DISTANCE BETWEEN TANKS
Gallons	Feet	Feet	Feet
Less than or equal to 6,000	15	5	3
Greater than 6,000	15	15	3

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