



FIRE & LIFE SAFETY STANDARD

Title: Emergency Vehicle Access	
Effective Date: 08/01/2006	Revised Date: 01/01/2014
Code References: California Fire Code	
Note: <i>This standard is a summary of Fire Department clarifications of City and State Codes. Information contained herein applies to typical circumstances and may not address all situations.</i>	

PURPOSE

This standard was developed with safety as the principle objective. This document is intended to provide a general guideline pertaining to the creation and maintenance of fire department access roadways required by Section 503 of the 2013 California Fire Code (CFC), as amended by local ordinance. The effectiveness of emergency response is directly related to the proper installation of fire access roadways. This standard includes requirements for:

- **Access Walkways**
- **Access to Structures**
- **Fire Access Roadways**
- **Fire Lane Identification**
- **Gates and Barriers**
- **Knox and Opticom Systems**
- **Premise Identification**
- **Multiple Points of Access**
- **Bollards**
- **Wildland Access/Bike Paths**

SCOPE

This standard applies to any facility where emergency response may be necessary. The information contained in this document is intended to assist the reader in attaining compliance and to ensure that privately owned roadways necessary for emergency response purposes will be available for use at all times. The California Fire Code and this standard establish minimum Roseville Fire Department access requirements. Where the City of Roseville street design standards are more restrictive, the more restrictive requirement shall apply.

DEFINITIONS

Access Walkways - An approved walking surface leading from fire access roadways to doors and other required openings in structures.

Bollards - Permanent or removable poles that are placed across a roadway for the purpose of restricting vehicular access to a portion of a site or to protect a piece of equipment from potential vehicular damage. Bollards are permitted across roadways, as long as they are the type that fold down and lay flat on the access roadway as identified in the City of Roseville Public Works Standard ST-38. See Figure 10.

Fire Access Roadways - The means for emergency equipment and personnel to access a facility or structure for emergency purposes. Roadways must extend to within 150 feet of all portions of the exterior of the first floor of any structure and must meet specified criteria for width, pavement characteristics, roadway gradient, turning radius, etc. Fire access roadways are also referred to as fire lanes. Extenuating circumstances, increased hazards, and additional fire safety features may affect these requirements.



FIRE & LIFE SAFETY STANDARD

Fire Lane Identification - Fire lane identification will be required when it is necessary to restrict parking of vehicles in order to maintain the required width of fire access roadways for emergency vehicle use. Unlawful use of fire lanes will be enforced by the local law enforcement agency in accordance with the California Vehicle Code (CVC) and the California Fire Code Section 503.3.

Knox and Opticom Systems - Knox systems include: Knox boxes used for secure placement of keys to the fire control room, Knox key switches that provide access to electric gates and Knox padlocks which can be used to secure manual gates and barriers. All Knox items are accessible to Fire Department personnel with a master key that is kept on fire apparatus. Opticom systems include high-speed strobe light systems mounted on emergency vehicles which activate motorized gates allowing for emergency access.

Premises Identification - The visual means used to readily identify a property or facility. It is also the numbering system that is placed on structures for the purpose of identifying separate buildings within a single facility.

Multiple Points of Access - Additional access points onto a site other than the "main entrance".

Vertical Traffic Calming Devices - Vertical traffic calming devices are not permitted on any fire access lane.

Wildland Access/Bike Paths - Requirements for access into an area that is yet to be developed, will remain undeveloped, or will be used for recreational activities such a biking or walking.

ACCESS PLAN SUBMITTIAL REQUIREMENTS

Access plans shall be submitted as part of the civil improvement package. The following is a list of items that, if applicable, shall be shown on the Access Plan.

- Access walkways
- Bollards
- Fire access roadways
- Fire lane identification
- Gates and Barriers
- Double detector check valve
- Fire protection equipment
- Hydrant locations
- Fire Department Connections
- Turning radius
- Knox and Opticom units

Once approved, access plans will be available for pick up along with the civil improvement plans. Site work is prohibited until the access and civil improvement plans have been reviewed and approved.

FIRE ACCESS ROADWAYS

Fire apparatus access roads shall be provided in accordance with Sections 503 of the California Fire Code, for every facility, building, or portion of a building hereafter constructed or moved when any portion of an exterior wall of the first story of the building is located more than 150 feet from fire apparatus access as measured by an approved route around the exterior of the



FIRE & LIFE SAFETY STANDARD

building. Said access roads may be modified by the Fire Chief when buildings are completely protected with an approved automatic fire sprinkler system, or other approved measure.

Fire apparatus roads shall be designed and maintained to support the imposed load of fire apparatus (68,000 G.V.W), and shall be provided with an asphalt concrete pavement surface so as to provide all-weather driving capabilities, in accordance with Section 503 of the California Fire Code.

1. Width of Fire Access Roads

The minimum width of a fire access roadway is 20 feet. If a center median is included, the required width shall be provided on both sides of the median. The width of fire department access roads is measured from bottom face of the curb to bottom face of the curb on streets with curbs and gutters, and from flowline to flowline on streets with rolled curbs. Flowline is the lowest continuous elevation on a rolled street curb.

2. Parking Restrictions

No parking is permitted on streets narrower than 28 feet in width. Parking on one side is permitted on a roadway that is at least 28 but less than 36 feet in width. Parking on two sides is permitted on a roadway 36 feet or more in width. See Figure 5.

3. Vertical Clearance

Fire access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches. See Figure 6.

4. Fire Access Road Grade

The grade for access roads shall not exceed 10 percent to provide for placement of the ladder truck during fire ground operations in accordance with Section 503 of the California Fire Code. The grade may be increased to a maximum of 15 percent for approved lengths of access roadways, when all of the structures served by the access road are protected by automatic fire sprinkler systems.

5. Turning Radii

The inside turning radius for an access road shall be 30 feet or greater. The outside turning radius for an access road shall be 50 feet or greater. See Figure 7.

6. Dead-End Access Roadways

Dead-end fire apparatus access roads in excess of 150 feet in length (measured from the curb perpendicular to the roadway) shall be provided with approved provisions for the turning around of fire apparatus in accordance with Section 503 of the California Fire Code.

7. Bridges

Bridge and culvert crossings that serve as part of fire apparatus access roads shall be constructed in accordance with Section 503.2.6 of the California Fire Code. The bridge or culvert crossing shall be designed for a live load of a minimum of 68,000 pounds gross vehicle weight (GVW). The ladder truck weight load is established at 22,000



FIRE & LIFE SAFETY STANDARD

pounds on the front axle and 46,000 pounds on the rear axle. Vehicle load limits shall be posted at both entrances to bridges and culvert crossings, as required by Section 503 of the California Fire Code.

FIRE LANE IDENTIFICATION

This standard shall apply to any roadway leading from a public way to, adjacent to, and surrounding a building of which the roadway could be used for emergency operations by local emergency authorities. Said fire lanes shall be in accordance with the 2013 California Fire Code and any applicable local amendments. Detailed plans shall be submitted to the Roseville Fire Department and/or site inspections shall be performed by the Fire & Life Safety Division prior to identifying fire lanes.

1. Fire Lane Determination

Fire lane determination is the sole responsibility of the Fire Department. Private property owners shall not designate and/or identify any roadway on their property as a fire lane without prior approval from the Fire Department.

2. Specifications

Fire apparatus access roadway width shall be determined by measuring from “face of curb” to “face of curb”. When roadways do not have curbs, the distance measured shall be from the edge of the roadway surface (all weather paved surface) excluding the header or edge boards.

Fire apparatus roads shall have an unobstructed width of not less than 20 feet and an unobstructed vertical clearance of not less than 13 feet 6 inches. See Figure 5. Vertical clearances or widths shall be increased when; in the opinion of the Chief, vertical clearances or widths are not adequate to provide fire apparatus access.

ACCESS ROAD WIDTH

Less than 28 feet
28 through 35 feet
Greater than 36 feet

PARKING RESTRICTIONS

No parking on either side
Parking on one side only
Parking on both sides

3. Identification

When it is determined by the Fire Department that a fire lane designation is required on the access roadway, proper methods within this standard shall be used for such identification.

The following methods of fire lane identification are taken from Section 22500.1 of the California Vehicle Code and one of the three methods presented below must be utilized when designating a fire lane:

- By posting of a sign immediately adjacent to, and visible from the designated place clearly stating in letters not less than 1 inch in height “NO PARKING FIRE LANE”, or



FIRE & LIFE SAFETY STANDARD

- By outlining or painting the place red and, in contrasting color, marking the place with the words “NO PARKING FIRE LANE”, which are clearly visible from the vehicle, or
- By a red curb or red paint on the edge of the roadway upon which is clearly marked the words “NO PARKING FIRE LANE”

Additionally, in order for private property owners to legally cause vehicles to be removed (towed) from the property, they are in lawful possession of, such as an apartment complex or business parking lot, a sign not less than 17 x 22 inches in size with the lettering not less than 1 inch in height, containing specific information as indicated in Figure 3 of this standard, must be installed at each entrance of the property. These signs are not required to be present when issuing a citation. However, if installed, these signs would be in addition to the fire lane identification requirements. All signs and curb markings are to be installed and maintained by the property owner.

4. Signage

Curbs marking fire lanes – See Figure 1.

All raised curbs in “NO PARKING FIRE LANE” areas shall be painted red with acceptable red curb paint and lettered to the above standards. Lettering shall be in white, 3 inches in height and have a minimum 0.5 inch stroke. Lettering shall be painted every 25 feet.

Signs marking fire lanes shall be installed per Figures 2 and 4. Spacing of such signs to be within 3 feet of each end of curbed areas and spaced a maximum of 50 feet apart thereafter. See Figure 4.

When islands are present, one sign is required for each island adjacent to a fire lane or access road, if the road is 20 feet or less. Signs must face oncoming vehicular traffic. See Figure 4.

“NO PARKING FIRE LANE” signs must be designed per Figure 3.

OBSTRUCTIONS TO FIRE LANES

1. General

To overcome obstructions such as gates or barriers, the Fire Department utilizes the products offered by the Knox Company. These products include, but are not limited to, the Knox box, the Knox padlock, and the Knox key switch. Knox boxes are used to hold keys to the fire control room allowing firefighters rapid access into this area in the event of an emergency. Knox padlocks are used to secure manually operated gates or barriers and can be used in conjunction with an existing padlock to allow access for both the Fire Department as well as a business owner. Lastly, Knox key switches are used to gain access into a property equipped with electric gates allowing the Fire Department to override the “system” and open a gate without a



FIRE & LIFE SAFETY STANDARD

card or special code. These systems require an acceptance test witnessed by the Fire Department prior to final approval of the project.

Knox items can be ordered by utilizing one of the following methods: By phone at (800) 552-5669, online at <http://www.knoxbox.com> or by obtaining a Knox order form at the Fire Department during regular business hours. For further information contact the Fire & Life Safety Division at (916) 774-5800.

In addition to the Knox products mentioned above, the Fire Department requires a strobe switch access system at all electrically powered gates. Such a system allows emergency vehicles to flash a vehicle mounted strobe light towards the sensor, which in turn overrides the system and opens the gate. This system shall have the ability to interface with the Tomar Model 780-1228-PRE or 3M Opticom traffic preemption optical signal emitter provided on all City emergency vehicles in accordance with Section 902 of the Roseville Fire Code. Provide a Tomar 1790-14 Strobeswitch or other approved system at all electrically powered gated entries. Said device shall activate via a frequency of 14.035 HZ +/- .25HZ (High-Priority). Said device shall be mounted at a height of 7 feet above the adjacent road surface and is subject to an acceptance test witnessed by the Fire Department prior to final approval of the project.

2. Gates and Barriers

The Fire Department shall review plans for all new access gates and/or barriers that may impede emergency vehicle or personnel access to a structure.

3. Electrically Operated Gates and Barriers

Electronically opened access gates located across fire apparatus access roads shall be provided with a Model #3502 electronic override switch manufactured by the Knox Company. Said switch shall interface with the key pad at the entry gate to provide fire apparatus access to the site in accordance with Section 503 of the California Fire Code. In the event of a power failure, the gate shall be automatically transferred to a fail-safe mode allowing the gate to be pushed open without the use of special knowledge or equipment, including battery back-up. Upon activation of the key switch, the gates (egress and ingress) shall open and remain open until returned to normal operation by means of the key switch. An acceptance test of the Knox access system shall be witnessed by the Fire Department prior to final approval of the project.

Electronically opened gates across fire apparatus access roads shall be provided with an approved strobe switch system that interfaces with the Tomar Model 780-1228-PRE or 3M Opticom traffic preemption optical signal emitter provided on all City emergency vehicles in accordance with Section 503 of the California Fire Code. An acceptance test of the emergency vehicle strobe switch system shall be witnessed by the Fire Department prior to final approval of the project.



FIRE & LIFE SAFETY STANDARD

All electronically opened perimeter access gates located across fire apparatus access roads shall be provided with a vehicle detection loop on the out-bound drive aisle from the site in accordance with Section 503 of the California Fire Code. The vehicle detection loop shall be placed a minimum of 10 feet from the gate to permit fire apparatus to activate the detection loop without interference from the gate. The vehicle detection loop shall be provided with a 30 second delay prior to closing the gate.

4. Manually Operated Gate and Barriers

Manual gates shall have Knox padlocks or Knox key boxes.

5. Manually Operated Gate and Barrier Design

Typical gate designs may include sliding gates, swinging gates or arms, or guard posts with a chain traversing the opening. Permanent signage (constructed of 18 gauge steel or equivalent) shall be attached on each face of the gate or barrier that reads "NO PARKING FIRE LANE". Letters shall be red on white background and a minimum of 3 inches high with a 0.5 inch stroke.

6. Clear Width

Openings for access gates located across fire apparatus access roads shall be a minimum of 14 feet of clear width, and shall provide a minimum unobstructed vertical clearance of 13 feet, 6 inches, in accordance with Section 503 of the California Fire Code. See Figures 6 and 8.

7. Setbacks from the Street

Gates and barriers shall be constructed per the Department of Public Works standard ST-25 for private gated entrances. See Figure 8.

8. Bollards

For a bollard detail see Figure 10.

9. Vertical Traffic Calming Devices:

Vertical traffic calming devices are not permitted on any fire access lane.

TYPES OF ACCESS

1. Access to Structures:

The dimension of 150 feet when used in relation to Fire Department access is commonly referred to as "hose pull distance." As the name implies, this is the maximum distance that firefighters can effectively pull a fire hose or carry other equipment to combat a fire. The hose pull distance is set at 150 feet due to a variety of factors, including standard hose lengths, weight of equipment, hydraulic properties, and accepted operational procedures.

Hose pull is measured along a path that simulates the route a firefighter may take to access all portions of the exterior of a structure from the nearest public road or fire lane. Under most circumstances, hose pull will not be a straight-line distance and



FIRE & LIFE SAFETY STANDARD

should not be measured “as the crow flies.” All obstructions such as fences, planters, vegetation, and other structures must be considered when determining whether a building is accessible from a particular location on the fire access roadway. Topography may also affect the potential access route and any significant changes in elevation must be accounted for when measuring hose pull distances. Hose pull measurements begin at a point in the street located 10 feet from the edge of the curb. See Figure 9.

2. Wildland Access

The following section is included to clarify requirements regarding the minimum specifications for bike lanes that serve as fire access lanes to a wildland environment. These requirements do not pertain to fire access lanes for access/egress for buildings. These requirements pertain to both City funded and privately funded roadways.

- A. The width of the roadways shall be a minimum of 14 feet, which includes 10 feet of asphalt paving with a 2 foot shoulder of decomposed granite on each side.
- B. The minimum turning radius for the roadways shall be 22 feet inside diameter and 32 feet outside diameter.
- C. The roadways shall be capable of supporting a minimum GVW of 30,000 pounds and shall be provided with adequate drainage to prevent major pooling of water on the surface.
- D. Access to the roadways may be protected from private vehicle traffic through the use of gates, which swing open to allow for the 14 feet of clear width, or through the use of drop down bollards.
- E. Bridges shall be constructed to allow 12 feet of clear width, capable of supporting a minimum GVW of 30,000 pounds, and shall allow a straight-line approach of at least 35 feet.
- F. Fire access points through the post and cable assembly shall be provided on both sides of the roadway at maximum intervals of 750 feet, or as close to this figure as topography allows. The cable crossing at the fire access point shall be a yellow plastic coated cable. The ends of the cable shall be secured to the posts in a similar fashion as the terminal post anchor, with the exception of adding a Roseville Parks and Recreation Department padlock connecting each end of the cable to the eyebolt.

These requirements are the minimum specifications that will allow fire apparatus to operate in a safe and effective manner. The Fire Department requirements shall not restrict any requirements in excess of minimum specifications that may be required by any other City department.



FIRE & LIFE SAFETY STANDARD

3. Multiple Points of Access

A site that contains a single building or combination of buildings that total 20,000 square feet or more shall be equipped with a minimum of 2 points of access. A minimum distance of 500 feet shall separate the 2 entrance points. If desired, one of the required access points may be closed to general traffic providing the gate or barrier used conforms to the gate requirements in this document. Approved permanent durable signage shall be attached on each face of the gate or barrier that reads "NO PARKING FIRE LANE". Letters shall be red on white background and a minimum of 3 inches high with a 0.5 inch stroke.

PREMISE IDENTIFICATION

Addressing of all buildings shall be consistent with identification and signage requirements of the California Fire Code Section 505, and the City of Roseville's Addressing Guidelines Standard.

An approved address sign shall be provided at each fire access road entry into the project while under construction.

Should the placement of buildings be such that the parking lot is located in the center of the property; lighted address numbers shall be installed facing the parking lot area in addition to the City's required addressing facing the street or "front" of the property.

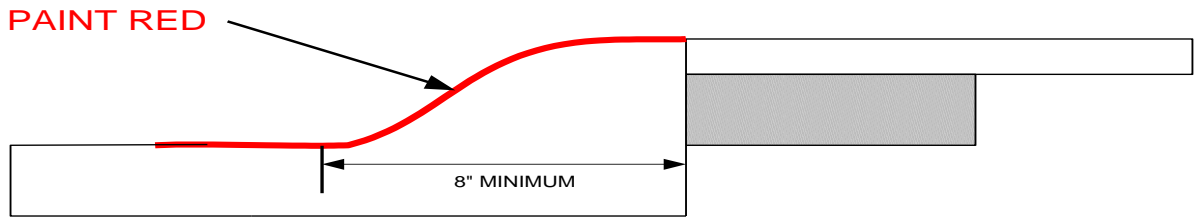


FIRE & LIFE SAFETY STANDARD

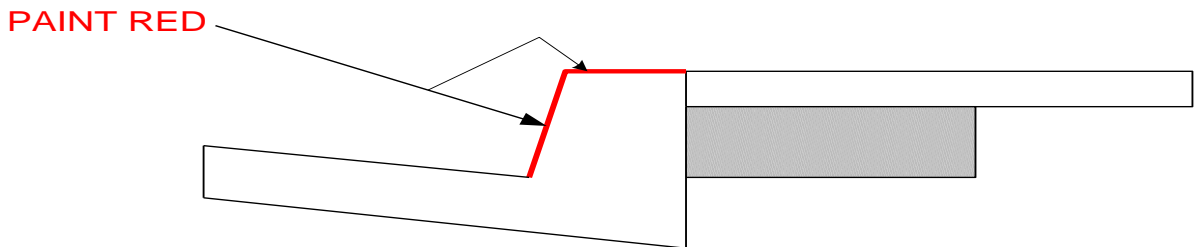
FIGURE – 1

Fire lane identification for curbs

ROLLED CURB



STANDARD CURB



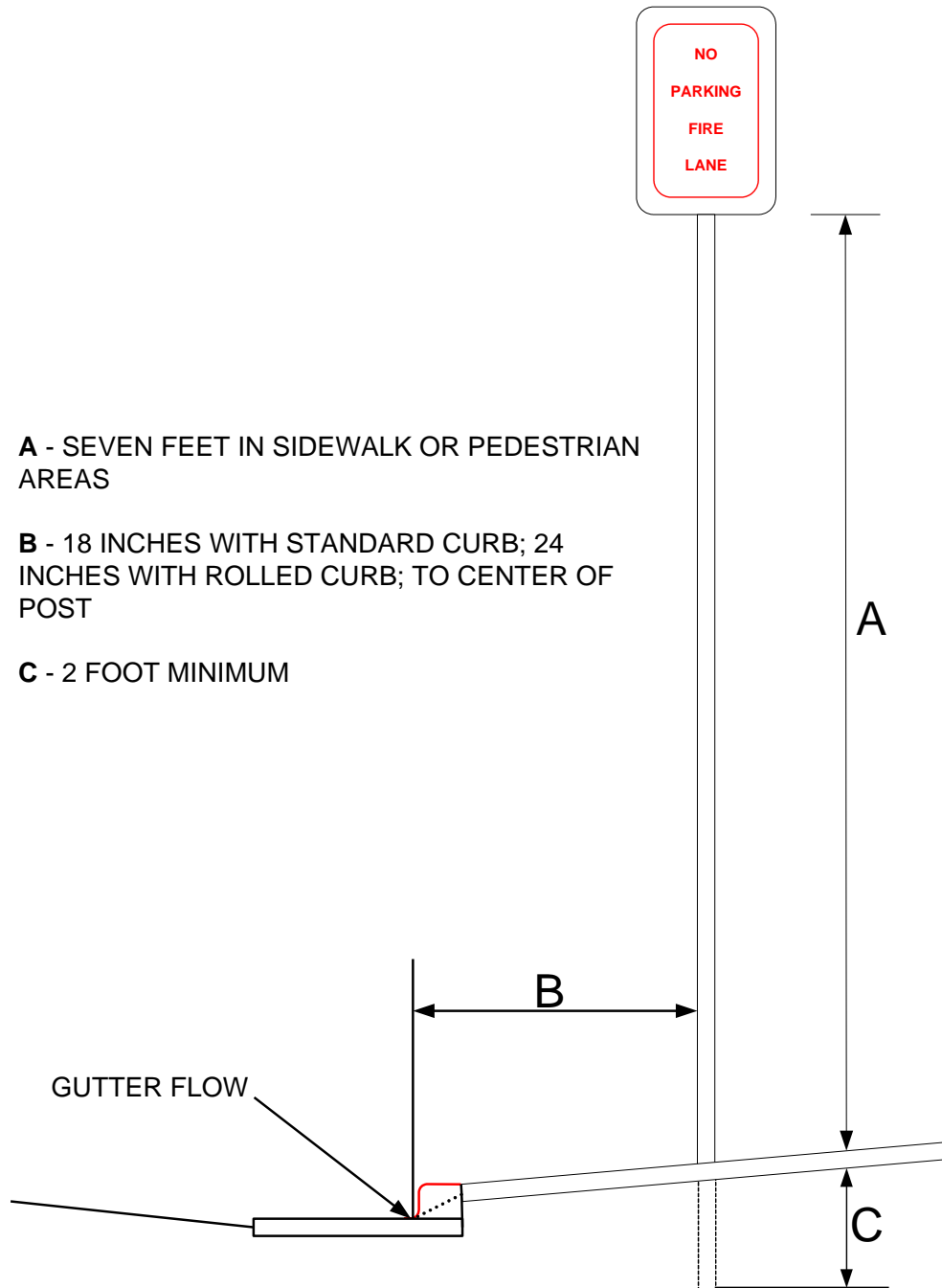
All raised curbs in "NO PARKING FIRE LANE" areas shall be painted RED with acceptable red curb paint and lettered to the above standards. Lettering shall be in WHITE, three (3) inches in height and have a minimum 1/2" stroke. Lettering shall be painted every 25 feet.





FIRE & LIFE SAFETY STANDARD

FIGURE – 2
Sign Construction



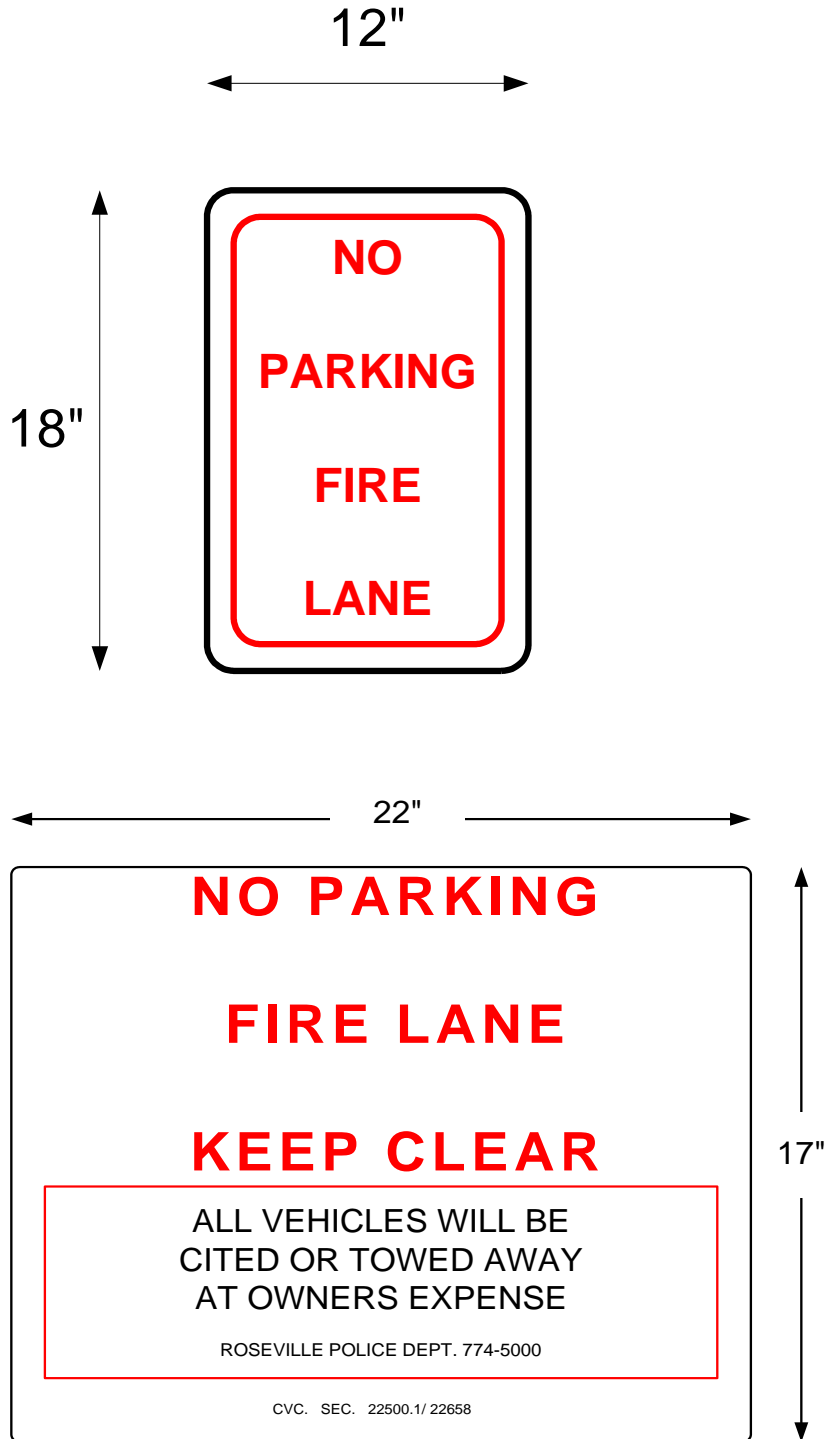
Note: Signs may be mounted on existing posts, fences or buildings, if post, fence or building is no more than 24 inches from the curb or edge of road surface.



FIRE & LIFE SAFETY STANDARD

FIGURE - 3

Fire lane sign dimensions and lettering

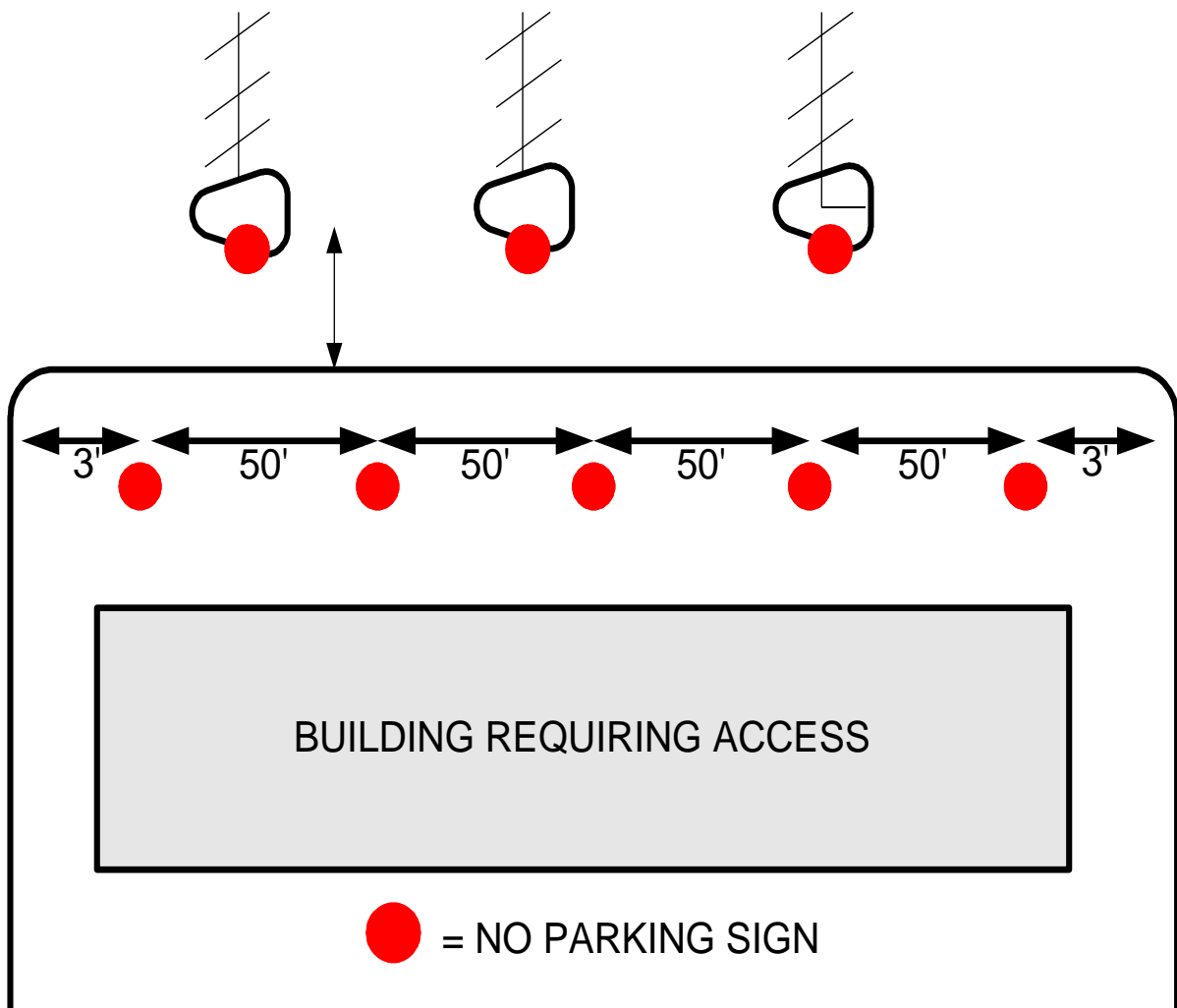




FIRE & LIFE SAFETY STANDARD

FIGURE - 4

Sign placement for islands adjacent to fire lanes



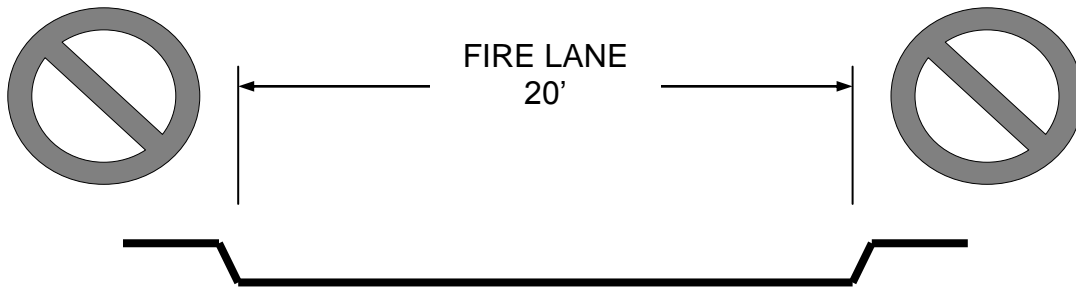


FIRE & LIFE SAFETY STANDARD

FIGURE - 5

Minimum Road Widths

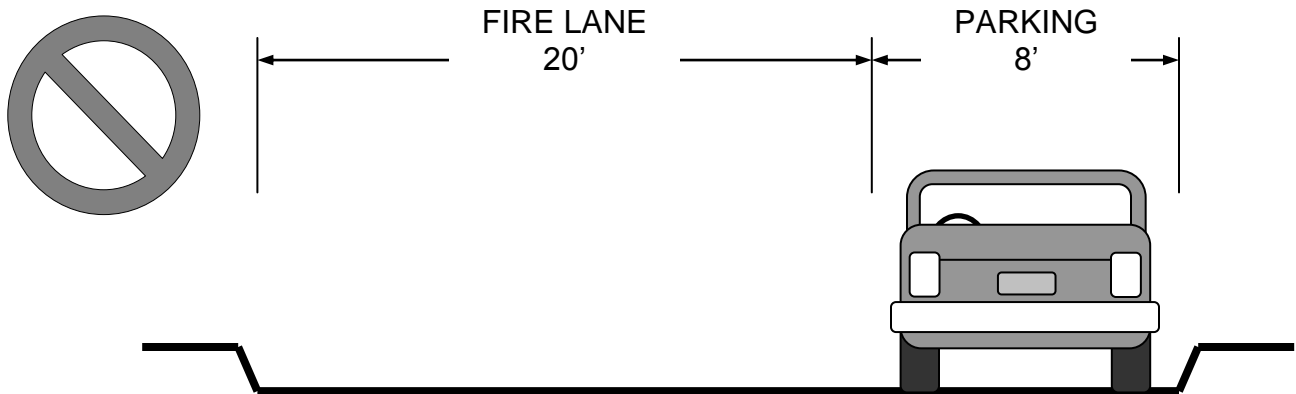
Measured from top face of curb to top face of curb or flowline to flowline.



ROADWAY LESS THAN 28'

Parking prohibited.

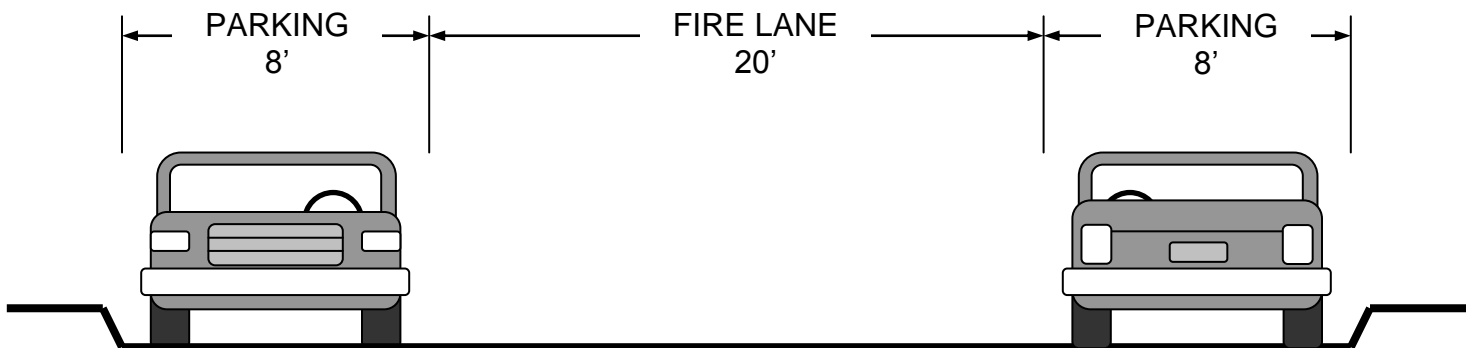
Roadway is required to be posted as a fire lane.



ROADWAY AT LEAST 28' BUT LESS THAN 36'

Parking permitted on one side only.

Roadway is required to be posted as a fire lane.



ROADWAY 36' OR WIDER

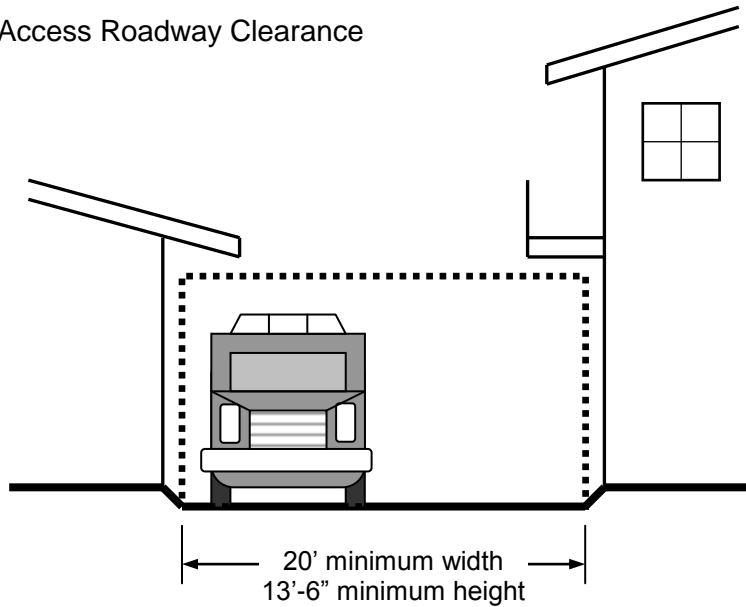
Parking permitted on both sides



FIRE & LIFE SAFETY STANDARD

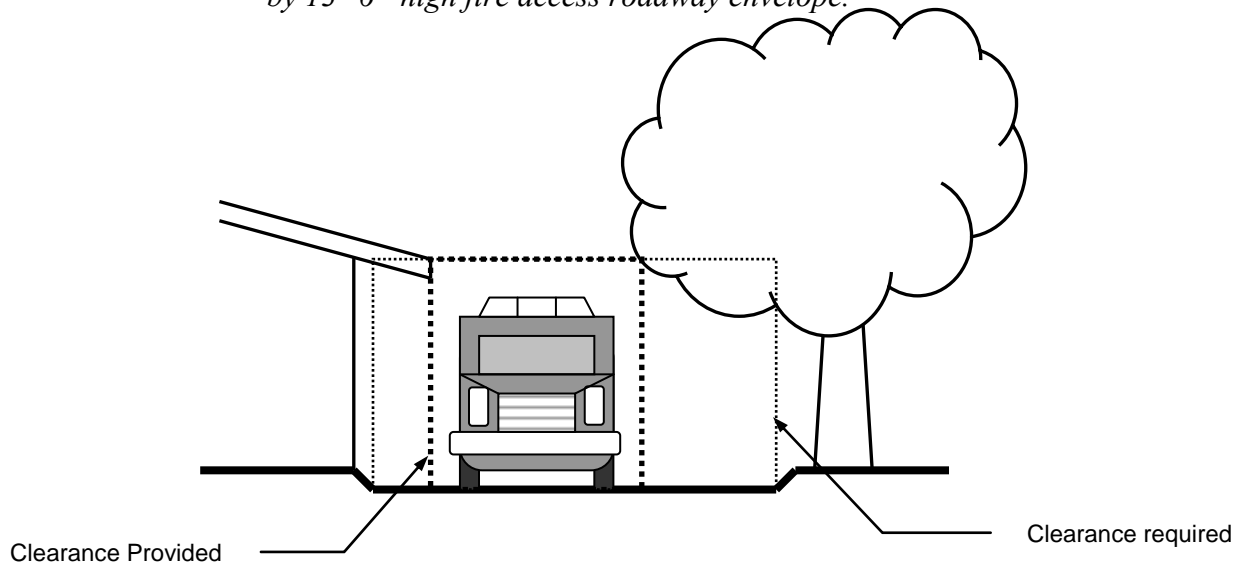
FIGURE - 6

Fire Department Access Roadway Clearance



PROPER CLEARANCE PROVIDED

Eaves, balconies, and other obstructions do not encroach upon the 20' wide by 13'-6" high fire access roadway envelope.



INSUFFICIENT CLEARANCE

A 20'-wide roadway has been provided, but eaves and vegetation effectively reduce the clear dimensions below required minimums.

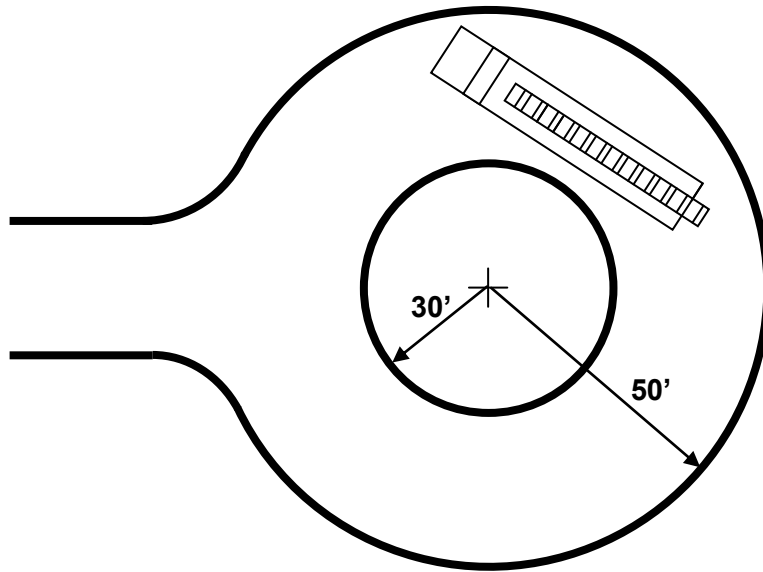


FIRE & LIFE SAFETY STANDARD

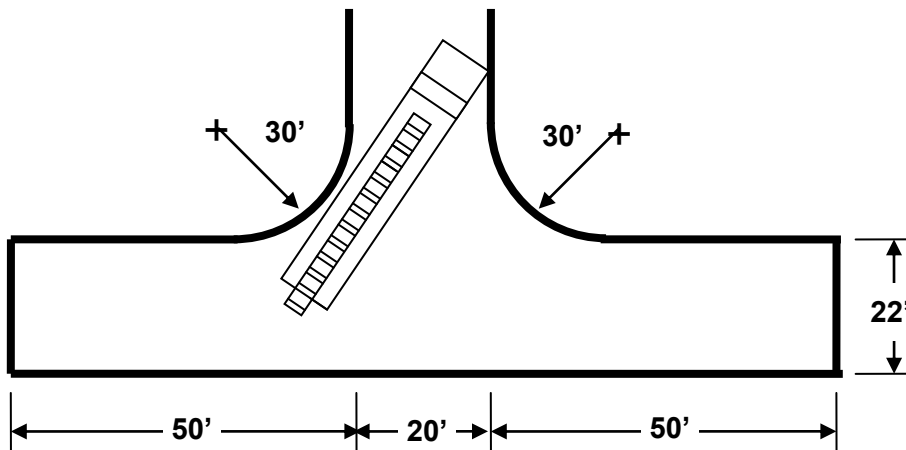
FIGURE - 7

Minimum Hammer Head and Turn-around dimensions.

TURNAROUND



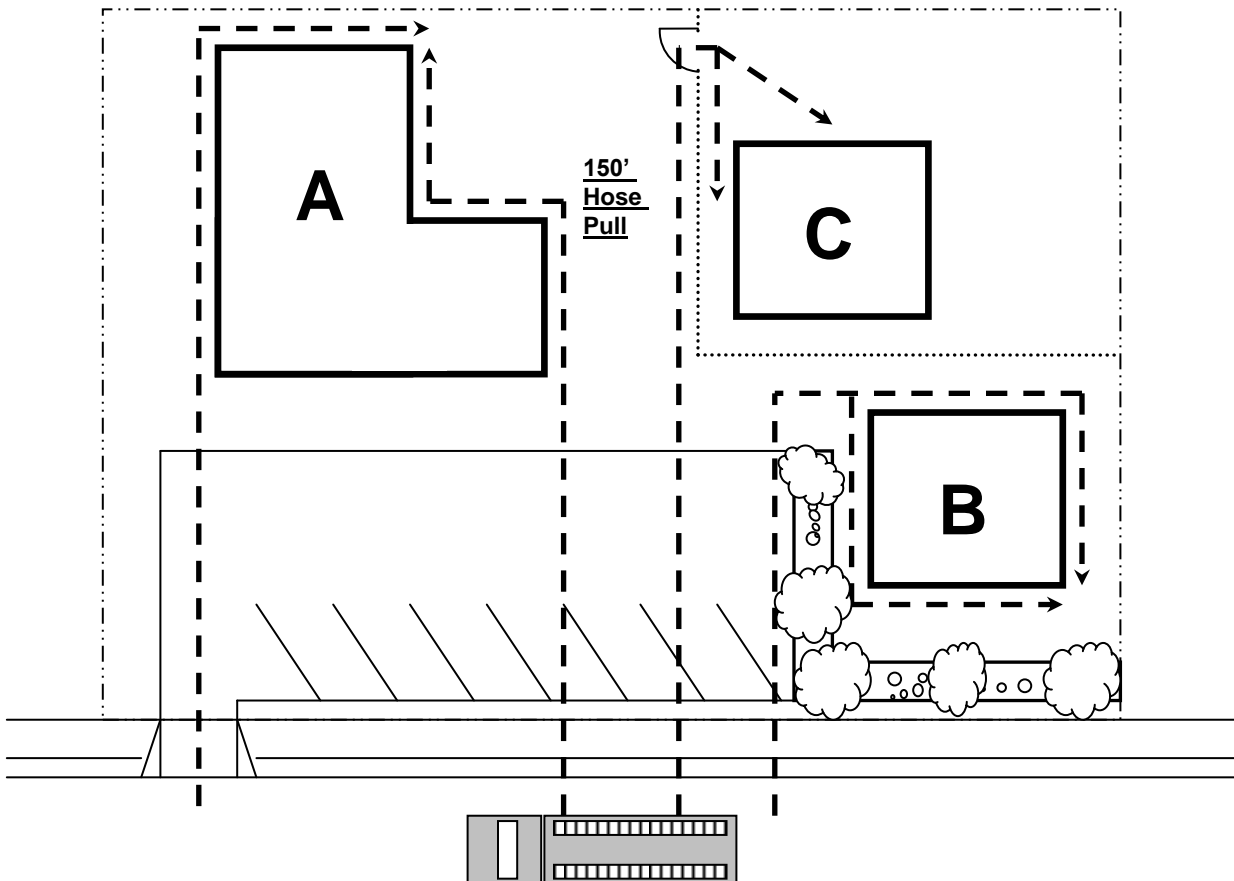
HAMMERHEAD





FIRE & LIFE SAFETY STANDARD

Figure - 9
Hose Pull



Assume that the parking lot is not accessible to fire apparatus due to turning radii and fire lane widths less than the required minimums.

All portions of building “A” are within 150’ feet of the public road as measured along the path of firefighter travel.

Building “B” is also in accessible despite the obstruction presented by the planter

Building “C” is not accessible; the presence of a chain link fence forces firefighters to backtrack once they pass through the gate, increasing their travel distance beyond 150’.

On-site fire access roadways or a change in the location of the gate and would be necessary to provide access to Building “C”.



FIRE & LIFE SAFETY STANDARD

FIGURE - 10
Bollard detail

