reduce this width if parking is not prohibited and the prohibition is posted. Section 503.3 addresses this need by giving the fire code official the authority to require marking of fire access roads. This section and Figure D103.6 add wording and dimension specifications for the signs needed to mark areas where parking is prohibited.

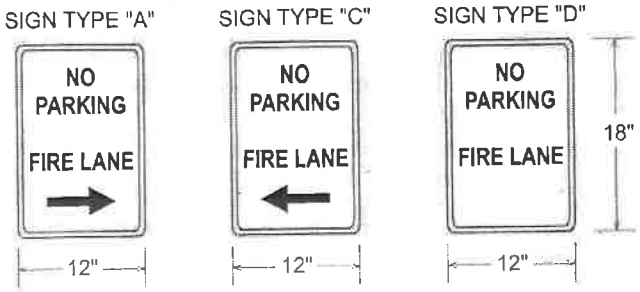


FIGURE D103.6
FIRE LANE SIGNS

D103.6.1 Roads 20 to 26 feet in width. Fire apparatus access roads 20 to 26 feet wide (6096 to 7925 mm) shall be posted on both sides as a *fire lane*.

❖ This section requires that parking be prohibited on both sides of narrower fire apparatus access roads. Twenty feet (6096 mm) is the appropriate width needed for two average-size fire trucks to pass one another. If that width is reduced by parking even on one side, it will be potentially difficult for a fire department to undertake emergency operations in that area.

D103.6.2 Roads more than 26 feet in width. Fire apparatus access roads more than 26 feet wide (7925 mm) to 32 feet wide (9754 mm) shall be posted on one side of the road as a *fire lane*.

❖ Because this width is more than sufficient for maneuvering at least two fire department vehicles by one another, parking would be allowed on one side.

SECTION D104
COMMERCIAL AND INDUSTRIAL DEVELOPMENTS

D104.1 Buildings exceeding three stories or 30 feet in height. Buildings or facilities exceeding 30 feet (9144 mm) or three stories in height shall have at least two means of fire apparatus access for each structure.

❖ This section addresses commercial and industrial buildings that, because of their height, have the potential of creating a large challenge to a fire department. This section, along with Sections D105, D106 and D107, contains requirements for fire apparatus access roads for specific kinds of buildings or developments. Section 503 gives the fire code official the authority to require more access roads but does not specify when the additional roads are required. The need for additional access roads will depend on so many factors that each situation must be judged individually.

Because of the height of these buildings, various types of vehicles may be needed, and having two or more means of approaching the site may be necessary to manage and manipulate the vehicles.

D104.2 Buildings exceeding 62,000 square feet in area. Buildings or facilities having a gross *building area* of more than 62,000 square feet (5760 m^2) shall be provided with two separate and *approved* fire apparatus access roads.

Exception: Projects having a gross *building area* of up to 124,000 square feet (11 520 m^2) that have a single *approved* fire apparatus access road when all buildings are equipped throughout with *approved automatic sprinkler systems*.

❖ When buildings are very large in area, two separate fire apparatus access roads are required because a large building may be difficult to access quickly, and if one of the access roads is blocked there is a large potential for loss. The exception acknowledges the ability of sprinklers to prevent most fires from growing quickly.

D104.3 Remoteness. Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

❖ This concept is similar to the one dealing with the remoteness of exits. One of the primary reasons for multiple access roads is to ensure that if one access road is blocked or otherwise unavailable, another will allow access to the fire department. Therefore, when more than one access road is required, they need to be separated by enough distance to avoid a situation where both would be blocked or unavailable simply because they are too close to one another.

SECTION D105
AERIAL FIRE APPARATUS ACCESS ROADS

D105.1 Where required. Buildings or portions of buildings or facilities exceeding 30 feet (9144 mm) in height above the lowest level of fire department vehicle access shall be provided with *approved* fire apparatus access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway.

❖ When building height exceeds 30 feet (9144 mm) above the lowest level of fire department vehicle access, the use of aerial fire apparatus becomes more necessary. This section states in general terms that the access roads must be capable of handling the larger aerial equipment and its need for wider road widths. The requirement for clear overhead space prevents interference with the aerial apparatus and avoids the possibility of personnel injury and equipment damage from electrical shock. These factors must be included in site design to make certain the fire department has the needed access to the buildings.

D105.2 Width. Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm), exclusive of shoulders, in the immediate vicinity of any building or portion of building more than 30 feet (9144 mm) in height.

❖ This section specifies the minimum road width needed for aerial apparatus. This width allows the aerial apparatus outriggers to be set solidly on the road surface for safe operation of the aerial equipment. Including adjacent road shoulders in the width measurement could yield substandard and inadequate driving or set-up surfaces for aerial apparatus. Accordingly, this section makes it clear that any road shoulders are not to be included in the minimum fire apparatus access road width.

D105.3 Proximity to building. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet (4572 mm) and a maximum of 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building.

❖ This section requires that the access road be specifically located where aerial equipment will have maximum access to the building. The fire code official, in consultation with the fire chief, must approve the final location of the road required by this section. Although not stated in this section, fireground operation protocols often place a truck company on the front side of the building so that the entire front can be reached by the ladder or tower basket. The road that will meet the requirements of this section will often be the public street upon which the building fronts. The distance from the building to the road must be reviewed and approved to match the capabilities of the fire department aerial equipment versus the buildings height.

SECTION D106
MULTIPLE-FAMILY RESIDENTIAL DEVELOPMENTS

D106.1 Projects having more than 100 dwelling units. Multiple-family residential projects having more than 100 *dwelling units* shall be equipped throughout with two separate and *approved* fire apparatus access roads.

Exception: Projects having up to 200 *dwelling units* may have a single *approved* fire apparatus access road when all buildings, including nonresidential occupancies, are equipped throughout with *approved automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

❖ This section is intended to provide some specific guidance to jurisdictions for dealing with larger apartment complexes. Again, Section 503 suggests that more than one access road is needed when there is a potential for an access road to be unavailable. In a large complex there is a large potential for loss. Lack of access should not become a factor in such a loss.

This section requires at least two separate access roads any time the number of dwelling units exceeds 100. The term "approved" is used because the layout of the complex may require some specific considerations when providing the access roads. For example, having two access roads leading onto a facility that come together before reaching the actual buildings may not satisfy the criterion of remoteness to be effective in an emergency.

The exception would allow a single access road for up to 200 dwelling units if all buildings on the site are fully sprinklered to meet code requirements. This exception acknowledges the effectiveness of sprinklers in slowing the growth of fires; therefore, the risk of having the access road blocked or unusable is more acceptable.

D106.2 Projects having more than 200 dwelling units. Multiple-family residential projects having more than 200 *dwelling units* shall be provided with two separate and *approved* fire apparatus access roads regardless of whether they are equipped with an *approved automatic sprinkler system*.

❖ Because of the large size of such complexes and the potential for large losses, even where sprinklers are installed as required by Section 903.2.8, two approved access roads must be provided. This section emphasizes that the exception in Section D106.1 is for up to 200 units only.

SECTION D107
ONE- OR TWO-FAMILY RESIDENTIAL DEVELOPMENTS

D107.1 One- or two-family dwelling residential developments. Developments of one- or two-family *dwellings* where the number of *dwelling units* exceeds 30 shall be provided with separate and *approved* fire apparatus access roads and shall meet the requirements of Section D104.3.

Exceptions:

1. Where there are more than 30 *dwelling units* on a single public or private fire apparatus access road and all *dwelling units* are equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 of the *International Fire Code*, access from two directions shall not be required.
2. The number of *dwelling units* on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the *fire code official*.

❖ This section requires that one- and two-family dwelling subdivisions with more than 30 dwellings have more than one fire apparatus access road into the development. The second access road is needed in case one access road for any reason becomes unusable. The two access roads must also be remote from one another as required by Section D104.3 to reduce the likelihood that both access roads would be compromised by a single fire or other emergency event.

Exception 1 states that when there are more than 30 dwelling units equipped throughout with an approved sprinkler system in accordance with NFPA 13, 13R or 13D, as applicable or approved, a second access road

including here those definitions that are most closely associated with the subject matter of this chapter is to provide more convenient access to them without having to refer back to Chapter 2. For convenience, these terms are also listed in Chapter 2 with a cross reference to this section. The use and application of all defined terms, including those defined in this section, are set forth in Section 201.

FIRE APPARATUS ACCESS ROAD. A road that provides fire apparatus access from a fire station to a facility, building or portion thereof. This is a general term inclusive of all other terms such as *fire lane*, public street, private street, parking lot lane and access roadway.

❖ Fire access roads are required to be all-weather surfaced roadways that are designed for the weight and type of emergency vehicle that may use the road. No specific surface material is required for a fire apparatus access roadway. It is up to the fire code official to decide whether the surface will support the load of the anticipated emergency vehicles in accordance with Section 503.2.3.

It should be noted that this is a general term intended to include any private roadway providing the required access to a building. As such, private driveways could be included and subject to the provisions of Section 503.

FIRE COMMAND CENTER. The principal attended or unattended location where the status of the detection, alarm communications and control systems is displayed, and from which the system(s) can be manually controlled.

❖ Fire command centers are communication centers where dedicated manual and automatic facilities are located for the origination, control and transmission of information and instructions pertaining to a fire emergency to the occupants (including fire department personnel) of the building. Fire command centers must provide facilities for the control and display of the status of all fire protection (detection, signaling, etc.) systems. These stations must be located in secure areas as approved by the fire code official. Often, this is a location near the primary building entrance. Fire command centers may also be combined with other building operations and security facilities, when allowed by the fire code official; however, operating controls for use by the fire department must be clearly marked and not subject to tampering by unauthorized persons (see the commentary to Section 508.1 for further discussion).

FIRE DEPARTMENT MASTER KEY. A limited issue key of special or controlled design to be carried by fire department officials in command which will open key boxes on specified properties.

❖ Several companies market emergency entry systems that use master keys. These keys are used to open key boxes and entry gates, and turn on/off electronic switches that control electric gates and certain building functions, such as smoke control systems, fans and special processes.

FIRE LANE. A road or other passageway developed to allow the passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than fire apparatus.

❖ The term "fire lane" is synonymous with "fire apparatus access road"; however, the driving surface may not be the same as for a public road.

KEY BOX. A secure device with a lock operable only by a fire department master key, and containing building entry keys and other keys that may be required for access in an emergency.

❖ The key box is part of an emergency entry system. The building owner/manager places a key box or key vault on the exterior of the building or at the entrance to the facility, placing keys, access cards or security codes inside the box. The emergency responders can use their special fire department master key to enter the box and gain access to the building or facility.

SECTION 503
FIRE APPARATUS ACCESS ROADS

503.1 Where required. Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through 503.1.3.

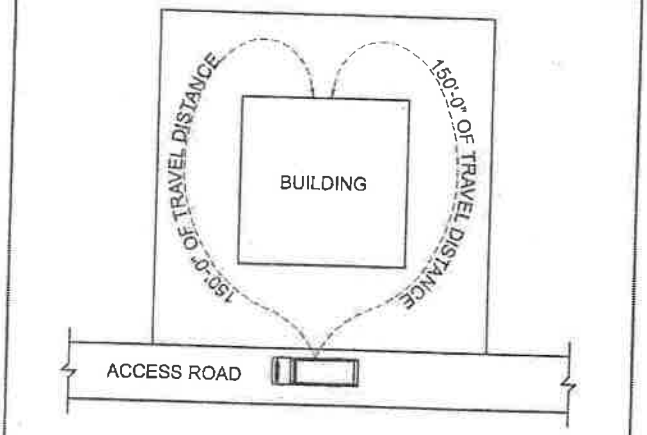
❖ This section introduces the requirements for dedicated fire apparatus access roads serving new and relocated buildings in the jurisdiction. The requirements are to be established in coordination with the local fire service to accommodate the jurisdiction's fire apparatus and equipment. The intent of the requirements is to provide the fire department with sufficient access to buildings to enable efficient fire suppression and rescue operations.

503.1.1 Buildings and facilities. *Approved* fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an *approved* route around the exterior of the building or facility.

Exception: The *fire code official* is authorized to increase the dimension of 150 feet (45 720 mm) where:

1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an *approved* alternative means of fire protection is provided.

access to the interior of the building could be achieved by hose streams or personnel. In the case of an exterior wall constructed on a property line with a zero-foot fire separation distance, Table 602 of the IBC requires that such walls have a fire-resistance rating of between 1 and 3 hours (depending on the occupancy group assigned to the building) and IBC Section and Table 705.8 require that such walls be without any openings. As such, access to the first (or any) floor level of that exterior wall would appear to provide little or no tactical usefulness to the fire department, especially if code-complying access is provided to other sides of the building.



For SI: 1 foot = 304.8 mm.

Figure 503.1.1(3)
SMALL BUILDING ACCESS

503.1.2 Additional access. The *fire code official* is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

❖ Additional access roads may be required by the fire code official based on his or her knowledge of traffic patterns, local weather conditions, terrain or the anticipated magnitude of a potential incident.

503.1.3 High-piled storage. Fire department vehicle access to buildings used for *high-piled combustible storage* shall comply with the applicable provisions of Chapter 23.

❖ Chapter 23 has special requirements for building access in occupancies with high-piled storage, but the requirements for fire apparatus access roads are the same as those required in this chapter.

503.2 Specifications. Fire apparatus access roads shall be installed and arranged in accordance with Sections 503.2.1 through 503.2.8.

❖ The dimensions of fire department access roads are based on the size and height of emergency vehicles, their turning radius and the fact that emergency vehicles may be required to pass each other on the access road.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), exclusive of shoulders, except for *approved* security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

❖ The dimensions in this section are established to give fire apparatus continuous and unobstructed access to buildings and facilities.

This section requires that the unobstructed width of a fire apparatus access road must not be less than 20 feet (6096 mm). The intent of the minimum 20-foot (6096 mm) width is to provide space for fire apparatus to pass one another during fire-ground operations. The need to pass may occur when engines are parked for hydrant hook-up, laying hose or when trucks are performing aerial ladder operations. When an engine company is connected to a fire hydrant parallel to the curb using a front suction connection and using a side-discharge port on the pump, the horizontal distance that is needed to make a no-kink bend in the discharge fire hose can be considerable, especially when a large-diameter hose (LDH) is being used. The roadway width needed to accommodate such a common operational scenario would be the width of the apparatus plus the no-kink bending radius of the discharge hose, leaving minimal roadway width for other apparatus to squeeze by, if needed. Including adjacent road shoulders in the 20-foot (6096 mm) width measurement could yield substandard and inadequate driving surfaces for apparatus and, as such, they are not to be included in the minimum width.

The minimum vertical clearance of 13 feet, 6 inches (4115 mm) is the standard clearance used for highway bridges and underpasses. The vertical clearance requirement would apply in cases where a building or portion of a building, such as a canopy or porte-cochere, projects over all or a portion of the required width of the fire apparatus access road. Conversely, if the full required width of the fire apparatus access road is provided outside of the footprint of the projecting building element, the vertical clearance requirement would not apply. It is not the intent of this section that all projecting elements be constructed with a 13-foot, 6-inch (4115 mm) vertical clearance, regardless of whether they encroach upon the required width of a fire apparatus access road. Appendix D contains additional guidance on fire apparatus access road dimensions. It is important to note that the appendices are not considered part of the code unless specifically adopted (see Section 1 of the sample adopting ordinance on page xiii of the code).

503.2.2 Authority. The *fire code official* shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations.

❖ The fire code official may require greater dimensions based on the size and maneuverability of the anticipated emergency response apparatus, including mu-