

Orange County Fire Authority

Community Risk Reduction

1 Fire Authority Road, Building A, Irvine, CA. 92602 www.ocfa.org 714-573-6100

Fire Master Plans for Public Schools



Guideline B-02

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Fire Master Plans for Public Schools

1. PURPOSE

The Division of the State Architect (DSA) is the authority having jurisdiction over the construction of public schools for grades K–12 and community colleges. However, DSA recognizes that the local fire authority is inherently more familiar than DSA with the water supplies and operational procedures critical to a rapid and effective emergency response at the public schools located within its jurisdiction. As such, DSA requires the design professional to coordinate with the local fire authority on projects that affect fire department vehicle and personnel access to structures and hydrants as well as the availability of water for firefighting purposes. DSA also asks that the local fire authority be consulted on the location of automatic fire sprinkler system control valves and fire department connections that may be used by firefighters during an emergency.

Regulations adopted by the State for access at public schools are not particularly detailed, generally stating only that a minimum 20-foot wide, unobstructed roadway capable of supporting fire apparatus and gates that allow passage to emergency vehicles and personnel be provided. The information in this document provides practical guidance on how to design fire access for public schools in the areas served by the Orange County Fire Authority (OCFA). It draws upon standard, uniform emergency access and installation standards used throughout the State as described in the California Fire Code (CFC) and NFPA 24 as well as operational procedures and capabilities particular to OCFA vehicles and suppression personnel. In addition, DSA establishes policies (available on the DSA website at www.dgs.ca.gov/dsa) that help to further define requirements for emergency access and water supply at public school campuses.

2. SCOPE

These guidelines are provided to assist you in understanding the administrative and plan review requirements necessary for gaining approval from the OCFA for projects at both new and existing public school campuses undergoing tenant improvement, additions, or modernization or any public school campus where temporary or permanent portable or modular buildings will be added.

New private school campuses or changes to existing private schools are subject to all regulations governing commercial development and are not addressed in this guideline; please refer to OCFA Guideline B-01 for more information.

3. SUBMITTAL REQUIREMENTS

3.1 SUBMITTAL PROCESS – See OCFA Guideline A-02 for a general overview of the plan submittal process.

3.2 DETERMINATION OF REQUIREMENTS -- The type of structures being placed on a public school campus and its duration and use determine the extent of the OCFA's review.

3.2.1 New school campus – The OCFA will perform a complete review of fire master plan components, including hydrant quantity and location, water availability, access to all structures, and vehicle and pedestrian gates.

3.2.2 Addition of permanent structures to an existing campus – the OCFA will perform a complete review of fire master plan components, including hydrant quantity and location, water availability, access to structures, and vehicle and pedestrian gates for the portion of the campus affected by the addition as well as the area leading to it. This category may include the addition of portable or modular units to accommodate a growing student population (see Section C.1.b below).

3.2.3 Existing campus undergoing modernization – These projects vary in scope from minor changes to restrooms to retrofit of an entire classroom or administrative buildings that results in the relocation of students and staff to portable structures.

3.2.3.1 Portables – If the modernization project includes the addition of portable units on the campus, the applicant must state on the plans whether such portables are for short-term or long-term use.

3.2.3.1.1 Short-term portables – Short-term portables are expected to be on-site for no more than 3 years. The OCFA will review the placement of short-term portables for access and vehicle and pedestrian gate requirements only. Review of hydrant location or water availability is not required for short-term portables. Should it become necessary that a portable originally classified as short-term need to remain on-site for more than 3 years, it may only do so only with the approval of the OCFA. Provide a stamped copy of the fire master plan that the short-term portables were originally approved under with a letter explaining the change in classification and the anticipated duration of the modular units. The OCFA may request other information in order to evaluate what additional fire protection measures are necessary, if any, due to this change in classification.

3.2.3.1.2 Long-term portables – Long-term portables are expected to be on-site for more than 3 years. The OCFA will review projects consisting of only long-term portables for hydrant quantity and location, water availability, access to structures, and vehicle and pedestrian gates.

3.2.3.2 Other modernization projects – Modernization or improvement projects that do not include the use of portable structures must be submitted to the OCFA for review if the modernization will alter the footprint of any building on campus, the location of or access to hydrants, or otherwise affect access to structures (e.g., fences, planters, and gates), fire flow requirements, or water availability. If the modernization project does not affect any of these items, and it is acceptable to DSA, the OCFA does not require submittal of plans. However, should DSA require the local fire authority's sign-off of a modernization project, even if these items are not affected, plans must be submitted to the OCFA for review of access and gates serving the areas affected by the modernization.

3.2.4 Use of school buildings by other agencies – Occasionally, outside organizations such as the YMCA or Headstart will propose the addition of facilities to an existing campus to host after-school activities, seasonal programs, or community events. The scope of the

OCFA's review of these facilities is dependent upon who will be using them. In the case where the facility will be used solely by the children normally attending class in that school and use of the facility is simply an extension of the normal school day or year, the project will be treated as any other school building. Where the facility offers services to the general public or other children not enrolled at the school, such as for daycare purposes or community activities, the project falls under the jurisdiction of the OCFA. Such facilities are subject to reviews not normally performed by the OCFA for public school buildings, including underground piping for sprinklers, architectural life-safety and egress, sprinkler system design, alarm and monitoring system installations, etc.

4. PLAN REQUIREMENTS

4.1 PLAN REQUIREMENTS – Plans shall be provided to demonstrate compliance with all codes and other regulations governing water availability and emergency access for new structures at public schools. In addition, changes to existing structures or sites shall be reviewed by the OCFA to ensure that the modifications do not affect water availability or access.

4.1.1 Scope – The scope of work shall be clearly indicated on the plan. Include a copy of the most recently approved site plan with your submittal, if available, to facilitate review and approval.

4.1.2 Building data – Information related to the building's location, use and construction shall be clearly indicated on the OCFA Fire Master Plan Cover Sheet and in the plan.

- Include the project's street address and the tract, tentative tract, or County Recorder's parcel map number.
- Indicate the types of occupancies that will be housed in the structure as described in California Building Code (CBC) Chapter 3.
- Indicate the construction type of each building. If sprinklers are being used for a one-hour construction equivalency, not this clearly on the plan.
- Allowable area or mixed occupancy calculations shall be provided for all structures or portable clusters over 6,000 square feet. Indicate all increases allowed by CBC Chapter 5 (e.g., multistory, side yards, or sprinklers for area, height, or construction type increase) that are being applied. Structures not separated from each other by the distances or fire-resistive construction specified in CBC Chapters 6 and 7 shall be considered the same structure for purposes of allowable area and determination of required fire flow in accordance with CFC BB105.

4.1.3 Plan notes – Include the notes at the bottom of Attachment 1.

4.1.4 Water availability – A Water Availability Form or equivalent data from a water purveyor or third party shall accompany all fire master plan submittals for projects where a new permanent building or long-term portable is added or where modification to an existing building increases the floor area of the structure. Water data may be requested by the OCFA for other conditions as necessary to ensure adequate fire protection for a particular site. In addition, DSA may require evidence of current water availability per DSA Policy PL 09-01.

Contact the local water agency for instructions and requirements for flow testing in their jurisdiction.

4.1.5 Completeness checklist – Complete Attachment 1, Public School Fire Master Plan Checklist, and verify that basic project information has been provided and that general access and water requirements have been addressed on the plan. Information other than that identified on the Checklist may be required depending on project parameters and site conditions.

4.1.6 DSA template – Include DSA’s Local Authority Having Jurisdiction Approval Template from DSA Policy PA 09-01 and form DSA-810 on the plan. Provide the following information in the template:

Agency Name: Orange County Fire Authority
Address: 1 Fire Authority Road, Irvine CA 92602
Phone Number: 714-573-6100

5. GENERAL CODE REQUIREMENTS

5.1 ACCESS REQUIREMENTS – For newly proposed schools, access requirements parallel those for any new commercial development. However, for many existing schools, fire department input was not required or requested at the time of construction and, as a result, portions of the campus may not be designed or built to these standards. In these cases, the DSA asks designers, school districts, and the OCFA to work collaboratively in developing a practical solution that maximizes access to existing structures and provides the greatest level of life-safety protection. As such, extenuating circumstances that result in increased on-site hazards may affect the requirements listed in this guideline.

5.1.1 Access to structures – Fire access roadways, often referred to as fire lanes, must be provided for every facility or building when any portion of an exterior wall of the first story is located more than 150 feet from a public roadway, as measured along an approved route that simulates the path of firefighter travel.

5.1.1.1 Hose pull – The dimension of 150 feet when used in relation to fire department access is 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 a structure from the nearest public road or fire lane. Under most circumstances, hose pull will not be a straight-line distance and 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 or fire lane. See Attachments 13 and 13a.

5.1.2 Fire access roadway construction – Fire access roadways shall be engineered to support emergency response apparatus. Roadways must be designed to facilitate turning radii of apparatus and meet requirements for gradient, height clearance, and width. Specific criteria pertaining to the design of fire access roadways are detailed below:

5.1.2.1 Load – Fire access roadways shall be designed, constructed, and maintained to support the imposed loads of OCFA fire apparatus with a total weight of 94,000 pounds. Apparatus weight is distributed as follows:

<i>Front Axle</i>	<i>Dual Rear Axles</i>	<i>Tiller</i>	<i>Distance between front and rear axle groups</i>
<i>32,000 lbs</i>	<i>42,000 lbs</i>	<i>20,000 lbs</i>	<i>16 feet</i>

Bridges and underground vaults, culverts, and other features beneath fire access roadways shall be designed, at a minimum, to the AASHTO H-20 standard. A letter or statement, wet-stamped and signed by a registered engineer, shall be provided on the plans certifying that any new roadway meets these loading and all-weather criteria. Road base without an appropriate topping or binding material does not satisfy the all-weather requirement. CFC 503.2.3

5.1.2.2 Width – The minimum unobstructed width of a fire access roadway is 20 feet. Fire access roadways narrower than the 20-foot minimum may be acceptable for short distances only to accommodate existing site conditions in an effort to improve overall access coverage at the campus.

5.1.2.3 Parking restrictions – In order to ensure that fire access roadways remain unobstructed to a minimum of 20 feet, no parking is permitted on fire access roadways 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. Red curbs or “Fire-Lane – No Parking” signs are required in areas where the fire lane is less than 36 feet in width. See Attachment 2

5.1.2.3.1 Drop-off/Pick-up lanes – In accordance with California Vehicle Code Section 22500.1 and DSA policy 07-03, student drop-off/pick-up areas shall not be combined with or otherwise overlap fire-lanes nor shall the student drop-off/pick-up areas reduce the width of fire lanes below 20 feet. Student drop-off/pick-up areas shall be configured in such a manner so as to not obstruct fire or emergency vehicles when private vehicles arrive and depart and passengers enter or exit vehicles.

5.1.2.4 Vertical clearance – Fire access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches. All vegetation, wires, eaves, photovoltaic panels or other obstructions overhanging the fire access roadway must be maintained clear to this height.

5.1.2.5 Grade – The grade for access roads shall not exceed 10% or 5.7 degrees (7% or 4 degrees in Irvine unless otherwise approved by the City Engineer). The grade may be increased to a maximum of 15% or 8.5 degrees for approved lengths of access roadways, when all structures served by the access road are protected by automatic fire sprinkler systems. Cross-slope shall not be greater than 2% for paved access roadways. CFC 503.2.7, 503.2.8.

5.1.2.6 Turning radii – The inside turning radius for an access road must be 20 feet or greater. The outside turning radius for an access road must be 40 feet or greater. As fire apparatus are unable to negotiate tight “S” curves, a 47-foot straight leg must be provided between these types of compound turns or the radii and/or road width must be increased accordingly. *Note: to accommodate the OCFA’s largest fire apparatus, an inside and outside turning radius of 20 and 40 feet, respectively, is recommended.*

5.1.2.7 Dead-end access roadways – Dead-end roadways in excess of 150 feet need to be designed and constructed with approved turnarounds. Turnarounds must meet the minimum dimensions specified in Attachment 3.

5.1.2.8 Poles, backboards, nets, picnic tables, and other obstructions – Typically, playground blacktop areas are the only way for fire apparatus to access many buildings on school campuses.

- Poles, backboards, or other items related to the normal use of the playground may not obstruct the path of emergency vehicles and may not be placed within apparatus turnarounds or hammerheads.
- As many playgrounds are unlit at night, reflective paint or tape must be applied to such obstructions to make them more visible to apparatus engineers navigating near or between them. A reflective stripe, approximately 4 inches wide, should be placed approximately 3 to 4 feet above the ground or as otherwise required to make the obstruction apparent to the fire apparatus engineer unless the edges of the fire lane are clearly delineated on the blacktop.
- Permanent or removable bollards are not permitted to be placed across fire access roadways.

5.1.3 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. The following methods are acceptable means of identifying designated fire lanes on public school campuses. Choose either Option A or B, but not a combination of the two, for each area of the campus (for instance, it is acceptable for red curbs to be used in the public parking lot areas and for “No Parking” signs to be used elsewhere on the campus):

- A. Specific areas designated as fire lanes must be marked with red curbs in accordance with the requirements specified in Attachment 4. In addition, each vehicle entrance to an area containing red curbs must be posted with an approved Fire Lane Entrance Sign. See Attachments 5, 5a, and 6. *This option is preferred by the OCFA.*

- B. “Fire Lane—No Parking” signs must be posted immediately adjacent to each designated fire lane and at intervals not to exceed 100 feet. See Attachments 6 through 8. In interior areas of the campus that are accessible only to school district vehicles (i.e., maintenance trucks or janitor’s carts), the spacing of such signs may be increased provided that the extent of the restricted parking area remains readily apparent and well-defined. Such areas will be evaluated on a case-by-case basis. In addition, each vehicle entrance to an area containing “Fire Lane—No Parking” signs must be posted with an approved Fire Lane Entrance Sign. See Attachments 5, 5a, and 6.

5.1.4 Premises Identification – For new schools, the main address for the school campus must be located on the side of the school that faces the public road to which it is addressed. These address numbers should be at least 6 inches high and be easily visible from the public road fronting the property. Such address numbers may be mounted to either a building or an independent monument.

5.1.4.1 New buildings – Any newly constructed buildings on the campus need to be identified with 6-inch-high address numbers or letters that are easily visible from the either the public way or internal fire access roadways, as applicable. Clusters of modular units with the same designation (e.g., “Colony A” or “Kindergarten”) may have 6-inch address numbers on only one structure in the cluster provided that each individual classroom is given a name or number that is prominently displayed on or next to each door.

5.1.5 Gates and other barriers – Gates are often constructed on public school campuses to control student egress during the day and to restrict use of the grounds after hours. Locations of vehicular and pedestrian gates and barriers must be clearly shown on the plans. For all gates or barriers across fire access roadways and for those pedestrian gates in the path of firefighter access to structures, information such as the type of gate (manual/electric, swinging/sliding), clear opening width (for vehicle gates), type of lock, and emergency override must be provided.

5.1.5.1 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. If the gate is not regularly used (i.e., open when the campus or adjacent parking areas are occupied), permanent signage constructed of 18 gauge steel or equivalent that identifies the gate as part of a fire lane and indicates that it shall not be blocked must be attached to the front and back of manually operated vehicle gates. See Attachment 9 for a sample sign.

5.1.5.1.1 Bollards – Bollards of any type, including removable bollards, are not permitted to be placed across fire access roadways.

5.1.5.1.2 Clear width – Gate openings for egress and ingress of vehicles shall not be less than 13 feet clear width. The vertical clearance shall not be less than 13 feet 6 inches, including landscaping and/or trees.

5.1.5.1.3 Setbacks – Vehicle gates shall be located to facilitate ingress without endangering emergency response personnel, emergency apparatus, and the general public. For retrofit installations, gates and barriers should be located a minimum of 46 feet from any major street. For gates and barriers at new campuses, a 56 foot setback is needed. A 27-foot minimum unobstructed setback is required beyond a gate to the first turn to allow sufficient emergency apparatus clearance. Reduced approach dimensions may be acceptable provided that it can be demonstrated that the reduced distance does not present an undue hazard to fire apparatus and personnel accessing the site via the gate.

5.1.5.1.4 Locks – Manually operated vehicle gates or barriers shall be equipped with Knox padlocks or a non-hardened, frangible padlock/chain that can be cut with bolt cutters. Pedestrian gates may be equipped with a Knox padlock, frangible padlock, or a Knox box containing a key that will open the gate. Note on the plan which type of lock will be used. Contact the Fire Prevention department to request Knox order forms, either in person, by email at frontcounter@ocfa.org, or by phone: 714-573-6100. When requesting the form, specify whether you need to order devices for vehicle/pedestrian gates or building access. When completing the order form, remember to mark on the form whether your device will be sub-mastered for police department use (typically, vehicle and pedestrian gates are sub-mastered). The service request number of an OCFA-approved public school fire master plan will be required to obtain an authorization signature on the Knox order form.

5.1.5.2 Electrically operated gates and barriers – Most vehicle gates at public schools are manually operated. For specific requirements for electrically operated gates, please refer to OCFA Guideline B-01 Appendix B.

5.2 HYDRANT AND WATER AVAILABILITY REQUIREMENTS – Applicants must demonstrate that hydrants are provided in the quantity and spacing described in CFC Appendix CC and are capable of delivering the amount of water required by CFC Appendix BB. The quantity and spacing of hydrants is governed by the fire flow required for the structure(s) served. The required fire flow is dependent upon the size of the structure (see Fire Area below), type of construction, and whether the building is sprinklered. This information should be shown clearly on the plans to assist in the determination of the minimum fire flow requirement.

5.2.1 Water availability – To facilitate the review process and avoid untimely delays in project approval, applicants are strongly encouraged to obtain fire flow data from the local water department or a qualified third party *prior to submitting plans to the OCFA*. Fire flow information is not required for projects that consist only of short-term portables or when structures are over 1000 feet from a public or private water main and are equipped with sprinklers in lieu of hydrants in accordance with CFC Appendix CC105.2. This procedure is outlined below:

1. Obtain a Water Availability Form from OCFA Planning & Development Services Section or download a form from their website: www.ocfa.org.
2. When filling out the project and building information on the Water Availability Form, care should be taken when determining the applicable fire area for the project. As stated above, fire flow is dependent on several factors, so the largest building or group of structures is not necessarily the *most demanding* in terms of fire flow. When a project consists only of the addition of portables to an existing site, the applicable fire area will be the portables themselves and any adjacent structures not adequately separated as described under “Fire Area” below. Other existing structures at the site, though more demanding, may be ignored under these circumstances.
3. Determine the required fire flow from the table in CFC Appendix BB. Per DSA Policy PL 09-01, a 50% reduction in fire flow (but not duration) may be taken when the fire area consists only of buildings equipped with an approved automatic fire sprinkler system. If you are unsure of how to calculate the fire flow requirement for your project, you may fax the form and pertinent building information to the OCFA at the number provided on the form and we will determine the fire flow for you. See Attachment 10.
4. Contact the local water company to request a hydrant flow test or fire flow modeling calculation, and have a representative of the water company complete and sign the last section on the form. In some cases, the water company may furnish testing information on their own form; this is acceptable provided that the form includes, at a minimum, the static pressure, residual pressure, and resultant flow in gallons per minute. Where flow is calculated relative to the elevation of a tank or reservoir, the elevation of the building pad shall be provided to determine the pressure differential due to elevation change. The water company may allow or require a qualified third party to perform the flow test for you.
5. Photocopy or scan the completed form onto your plans or include the original with your plan submittal.

5.2.2 Fire Area – Fire area is used to determine the potential fire load present at a site and the resultant water supply necessary to effectively combat a fire of that size and protect adjacent structures. Typically, multiple buildings of similar construction located within 20 feet of each other are considered to be part of the same fire area, unless otherwise protected or separated in accordance with the California Building Code (refer to Tables 601 and 705.5 therein). The floor area of each floor in multi-story buildings must be included in the fire area calculation, although miscellaneous structures such as covered walkways, open lunch shelters, ball walls, back stops, non-combustible bleachers, and utility towers need not be included.

5.2.3 Hydrant Location – Hydrants shall be provided along the length of the fire access roadway in the minimum quantities and at the maximum distances prescribed in CFC Appendix CC. See Attachments 11 and 13a. Hydrants shall meet the following criteria:

- Hydrants must be located no more than 3 feet from the edge of a fire access roadway (or immediately beyond a sidewalk if one is adjacent to the roadway) and cannot be located in areas where they will be visually or operationally obstructed (behind fences or walls, in bushes, behind parking spaces, etc.). Clearance shall be provided to a distance no less than three feet from the perimeter of the hydrant.

- At least one 4-inch hydrant outlet must face the fire access roadway. Where possible, the number of outlets facing the roadway should be maximized.
- The hydrant shall be located at least 40 feet from the building(s) it serves. Where it is impractical to locate the hydrant 40 feet from adjacent structures, it may be located closer provided that nearby walls do not contain openings and the hydrant is not otherwise located where it can be rendered inoperable due to damage from collapsed walls, debris, or excessive heat.
- Hydrants and fire department connections (FDC) should be located so that a hose line running between the hydrant and the FDC does not cross driveways, obstruct roads or fire lanes, or otherwise interfere with emergency vehicle response and evacuation of a site.

5.2.4 Protection of Hydrants – Where hydrants are located such that they are exposed to potential damage from vehicular collision, they must be protected by curbs or bollards as follows:

- Hydrants located on or adjacent to playgrounds or similarly open areas of pavement must be protected by bollards. If vehicles can approach the hydrant from more than one direction, the hydrant must be protected by 4 bollards of concrete-filled pipe 4 inches in diameter and mounted in concrete in a square around the hydrant. The bollards need to be spaced a minimum of 3 feet from the perimeter of the hydrant. The bollards must be placed so that their location does not impede access to or use of the hydrant. Two bollards may protect hydrants that can be approached from only one side. See Attachment 12.
- Hydrants may not require protection by bollards if they are located such that the potential for collision is minimal or if they are sufficiently protected by standard concrete curbs 6 inches or greater in height.

5.3 OTHER APPROVALS – Fire Department Connections (FDC), Post Indicator Valves (PIV), Backflow Preventers (DDC/DCA), Alarm Systems, and Elevators: In addition to access, gate, and hydrant approval, the DSA may defer review of other items to the OCFA, namely the location of underground appurtenances for sprinklered buildings, the recommended type of alarm system for a specific application, or whether alternatives for undersized elevators are acceptable for emergency medical response. To facilitate the review process, this information should be shown on the fire master plan submitted to the OCFA instead of being requested at a later date. *NOTE: The review of the underground piping system by the OCFA is limited to the location of FDCs, PIVs, DDCs, and similar devices that may be used by the fire department during an incident. The review of alarm systems is limited to the recommended type of system or location of the fire alarm panel only. The OCFA does not perform a complete review of either of these systems unless specifically requested by the DSA.*

5.3.1 FDCs – Show the location of the FDC on the plan for any sprinklered buildings. FDCs may be mounted on the backflow prevention device/double detector check, if permitted by the local water agency, or in a separate location. FDCs shall meet the following criteria:

- FDCs shall be located immediately adjacent to the fire department access road and within 150 feet of the hydrant as measured along the fire access roadway. FDCs shall be a listed assembly. The plan shall specify the FDC make and model.

- Indicate on the plan which building(s) each FDC serves.
- Note on the plan that each FDC will be provided with a sign, securely mounted to the FDC and of a durable material with contrasting lettering, indicating which building(s) it serves.

5.3.2 DDCs/PIVs – Valves controlling the fire sprinkler or hydrant water supply shall:

- Be located at least 40 feet from the building(s) served where practical or otherwise located in accordance with OCFA Guideline B-03.
- Have a sign securely mounted to the device indicating which building(s) it serves.
- Be clearly visible and accessible from the street fronting the property or an on-site fire lane and have sufficient clearance to allow unobstructed operation of the valve(s) (3 feet around the perimeter of a PIV, 3 feet on at least one side of a DDC).
- Be secured with a Knox or frangible padlock.

5.3.3 Alarm Systems – See DSA Guideline GL-2 and IR 9-1. If OCFA input regarding the type of alarm system needed is required by the DSA, indicate on the plan which structures will be provided with alarm systems and list the type(s) of system that will be installed. The most common types are listed below:

- Manual system with pull stations near the exits from the building and notification devices throughout.
- Manual system with augmented detection by addition of smoke/heat detectors in particular rooms/buildings.
- Automatic system with notification devices throughout commonly occupied spaces, including a manual pull station in the administration office.
- Automatic system augmented by addition of smoke and/or heat detectors in particular rooms/buildings, including a manual pull station in the administration office.
- Fully manual and automatic system with smoke and/or heat detectors and notification devices throughout, including manual pull stations at each exit and one in the administration office.

5.3.4 Elevators – See DSA Policy 09-05. If elevators are being proposed, they shall meet the requirements and minimum sizes specified in CBC 3002.4 and 3002.4a for accommodation of gurneys and stretchers. If proposed elevators meet those criteria, state this on the plan. If not, use of stairways in lieu of elevators may be proposed for consideration by the OCFA, with an explanation why gurney size elevators are not feasible. Such stairways shall serve no more than one story above or below the level of fire department access nearest the stairway. Provide plans of the stairway at ¼ inch or larger scale for evaluation.

ATTACHMENT 1

Public Schools Fire Master Plan Checklist

Completed OCFA Fire Master Plan Coversheet?	<input type="checkbox"/> Yes	
Scope of project is clearly defined on the plan?	<input type="checkbox"/> Yes	
Portables are defined as short or long term?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (No portables)
Tract or Recorder's parcel map number provided?	<input type="checkbox"/> Yes	
Water availability/fire flow data provided?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Extent of all fire lanes is shown on the plan?	<input type="checkbox"/> Yes	
Turning radii are shown or noted on the plan?	<input type="checkbox"/> Yes	
Are the areas that are out of access identified on plan?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A
Are all gates, fences, and planters shown?	<input type="checkbox"/> Yes	
Are vehicle gates identified as manual or electric?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (No gates)
Manual vehicle gates have "No Parking" sign noted?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (No gates)
Are all hydrants within 250' of the school shown?	<input type="checkbox"/> Yes	
Building served by each FDCs/PIV noted on plan?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (No sprinkler system)
Are hydrant/FDC/DDC/PIVs protected from damage?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (Curbs provided)
Red curbs are identified with bold or dashed lines?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (Signs provided)
Location of each "Fire Lane—No Parking" sign shown?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (Red curbs provided)
Entrance sign provided at each vehicle entrance?	<input type="checkbox"/> Yes	
Detail of red curbs/"No Parking"/entrance signs shown?	<input type="checkbox"/> Yes	
Location of main school address shown on plan?	<input type="checkbox"/> Yes	
Engineer's certification provided for new paving?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (No new paving)
Hold harmless letter provided for existing paving?	<input type="checkbox"/> Yes	<input type="checkbox"/> N/A (All paving certified)
DSA forms are included with the submittal?	<input type="checkbox"/> Yes	

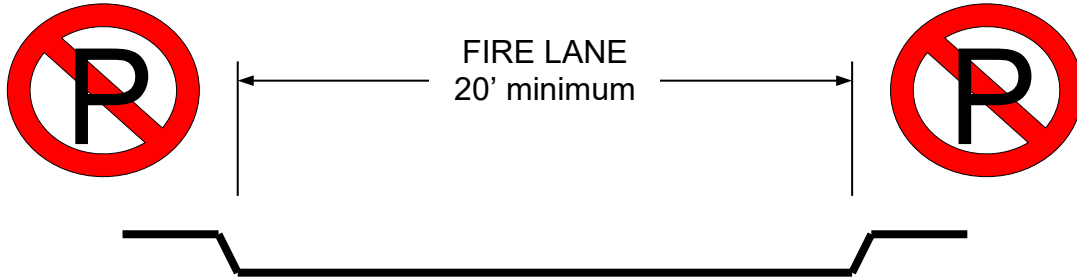
Include the following notes on the plan:

1. All vegetation and other obstructions overhanging a fire access roadway shall be maintained to a clear height of 13'-6".
2. All poles, backboards, and other obstructions on playgrounds near a fire access roadway shall be provided with reflective tape or paint.
3. Knox key switches, Knox locks, or frangible padlocks/chains shall be provided for all gates and barriers in the path of vehicle or firefighter access.
4. The campus is identified with 6" high address numbers easily visible from the public road fronting the property. Individual structures are identified with 6" high address numbers or letters easily visible from the public way or fire access roadway.
5. All-weather access roadways and all fire hydrants shall be in place and operational before bringing combustible building materials or portable units on-site.
6. PIVs, DDCs, FDCs shall be unobstructed and visible from the fire lane or public road. They shall be painted OSHA safety red.

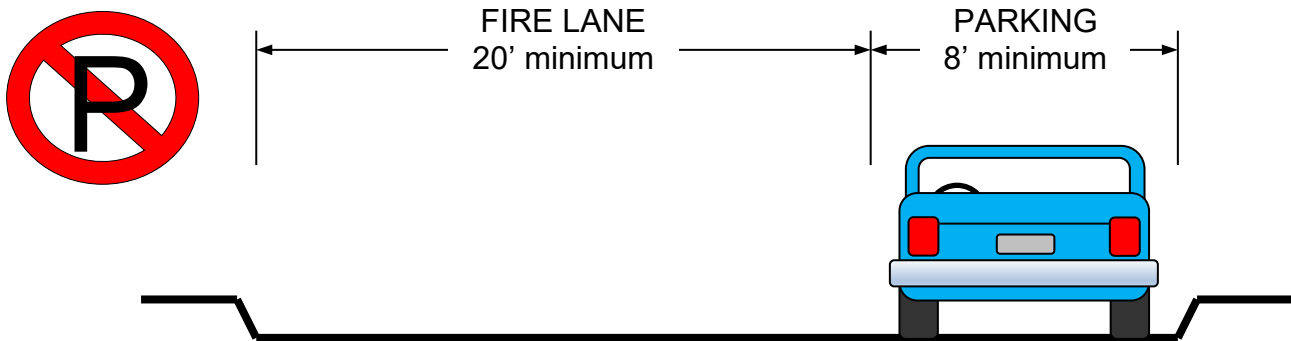
ATTACHMENT 2

Minimum Fire Lane Widths

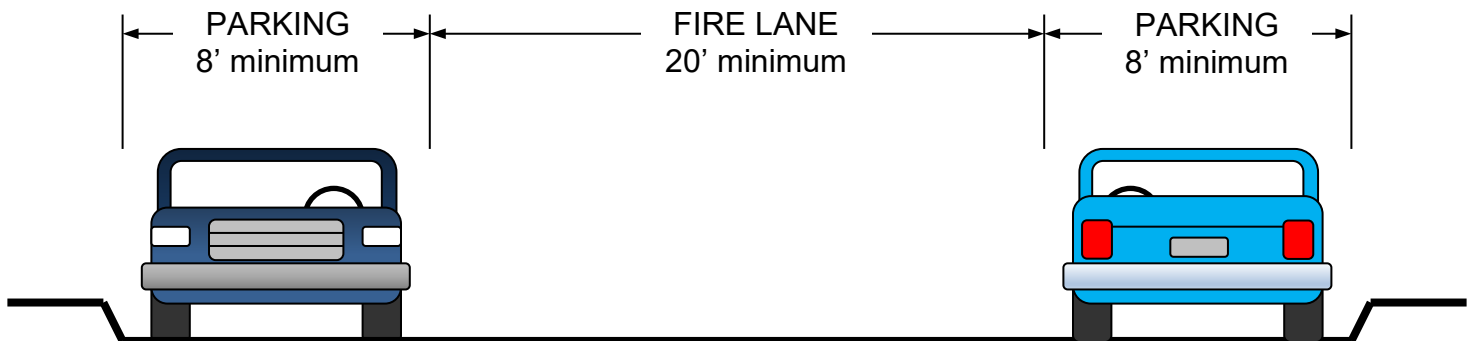
Width is measured base of curb to base of curb for standard curbs
or flowline to flowline for rolled curbs



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.

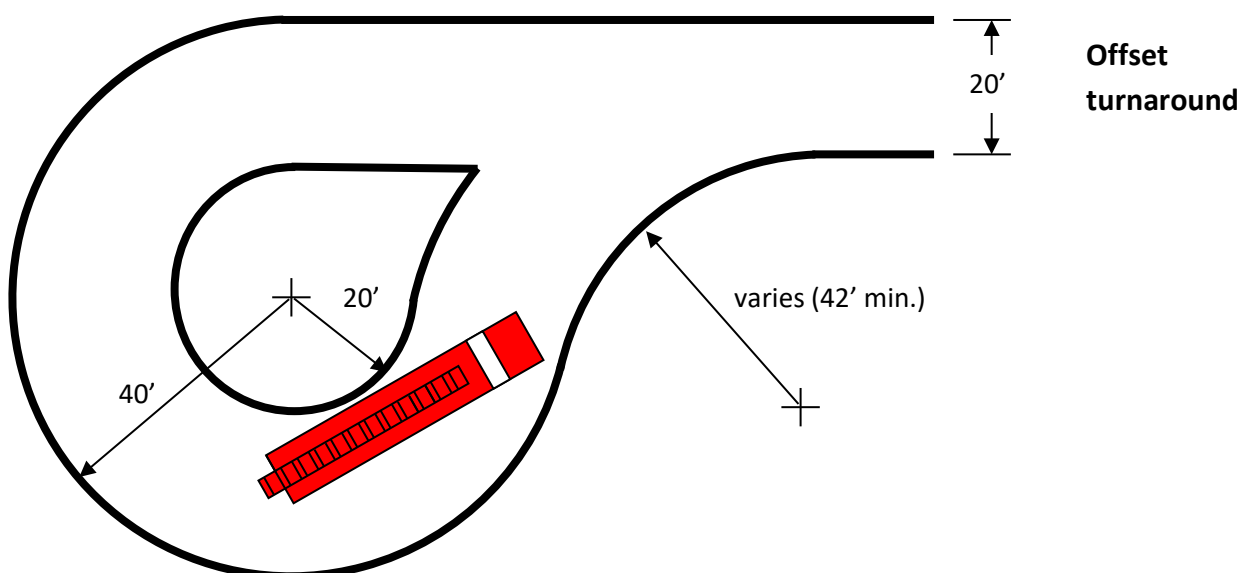
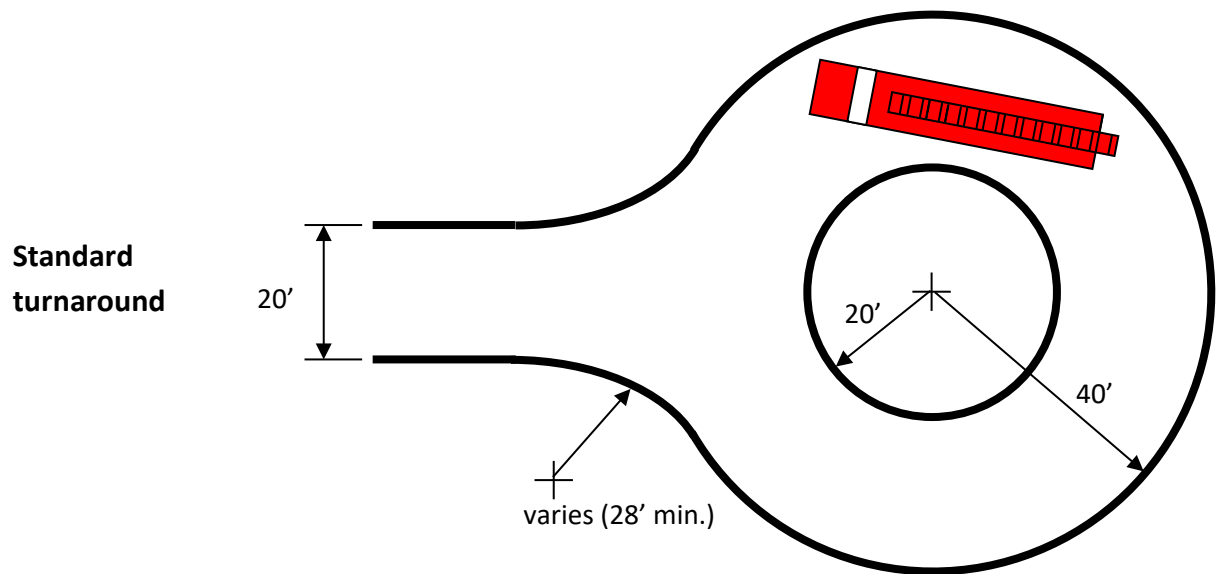


ROADWAY 36' OR WIDER
Parking permitted on both sides

ATTACHMENT 3

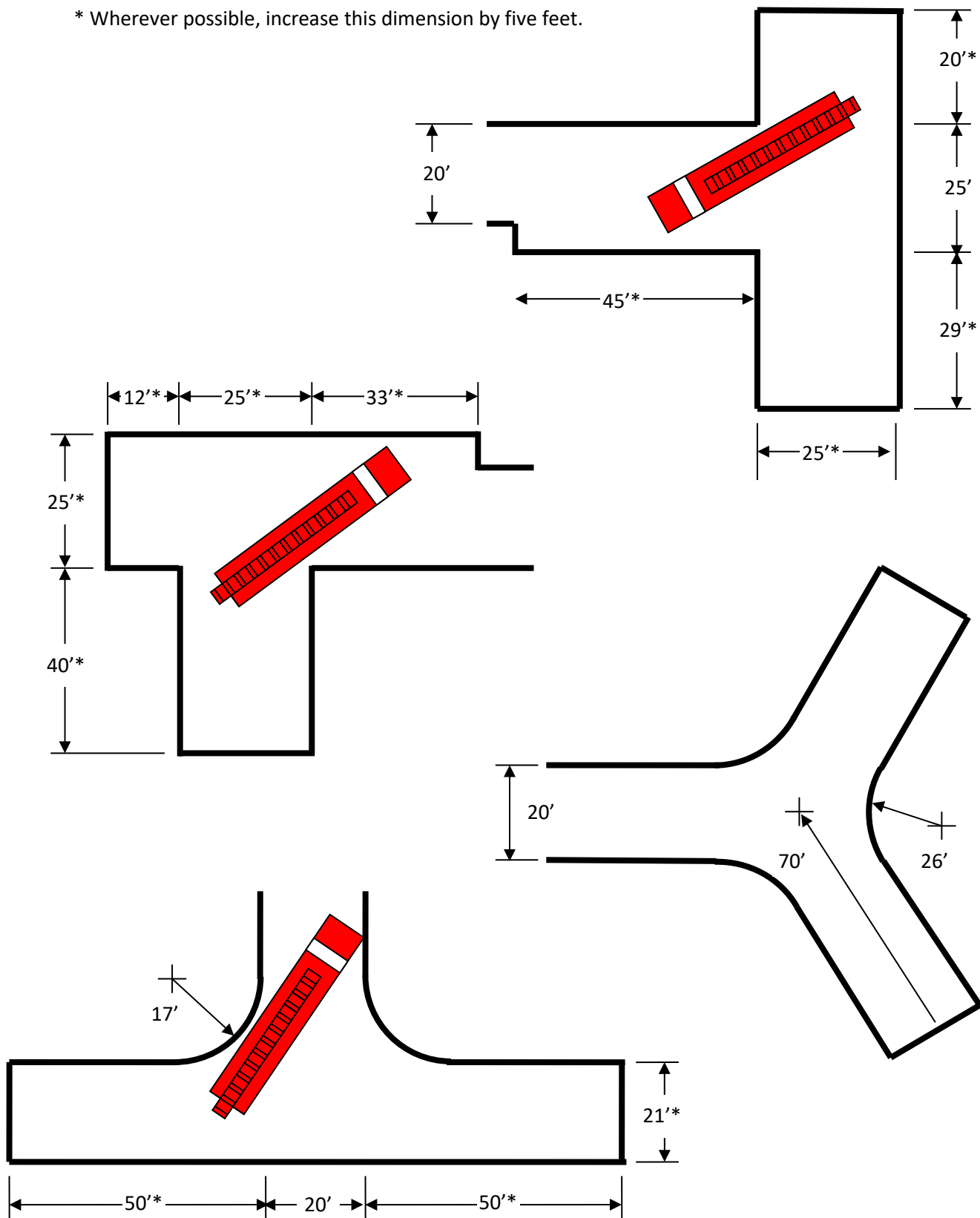
Minimum Turnaround and Hammerhead Dimensions

NOTE: Parking is not permitted in these turnarounds at the dimensions shown.



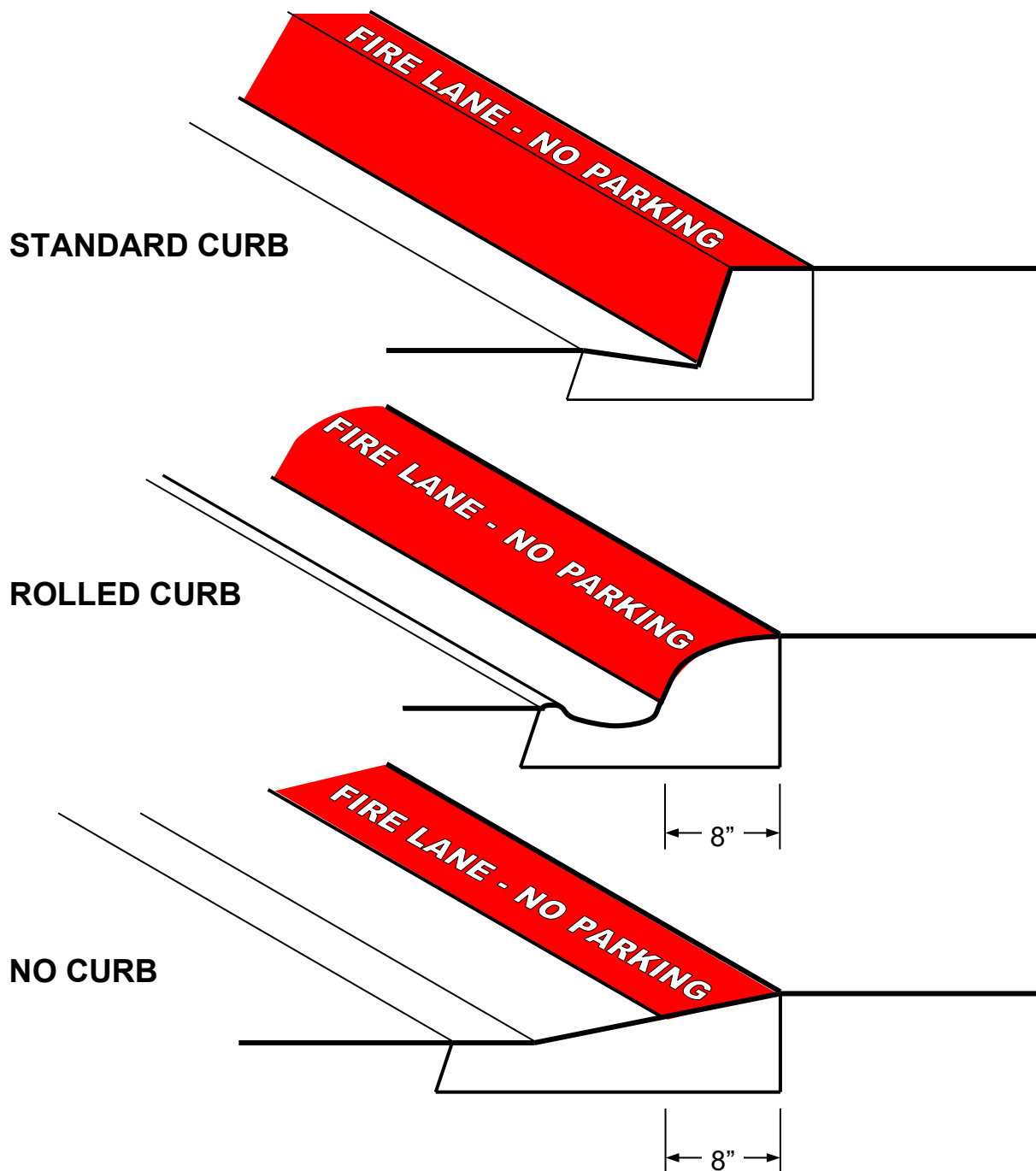
NOTE: Parking is not permitted in any of these hammerheads at the dimensions shown.

* Wherever possible, increase this dimension by five feet.



ATTACHMENT 4

Fire Lane Identification – Red Curbs

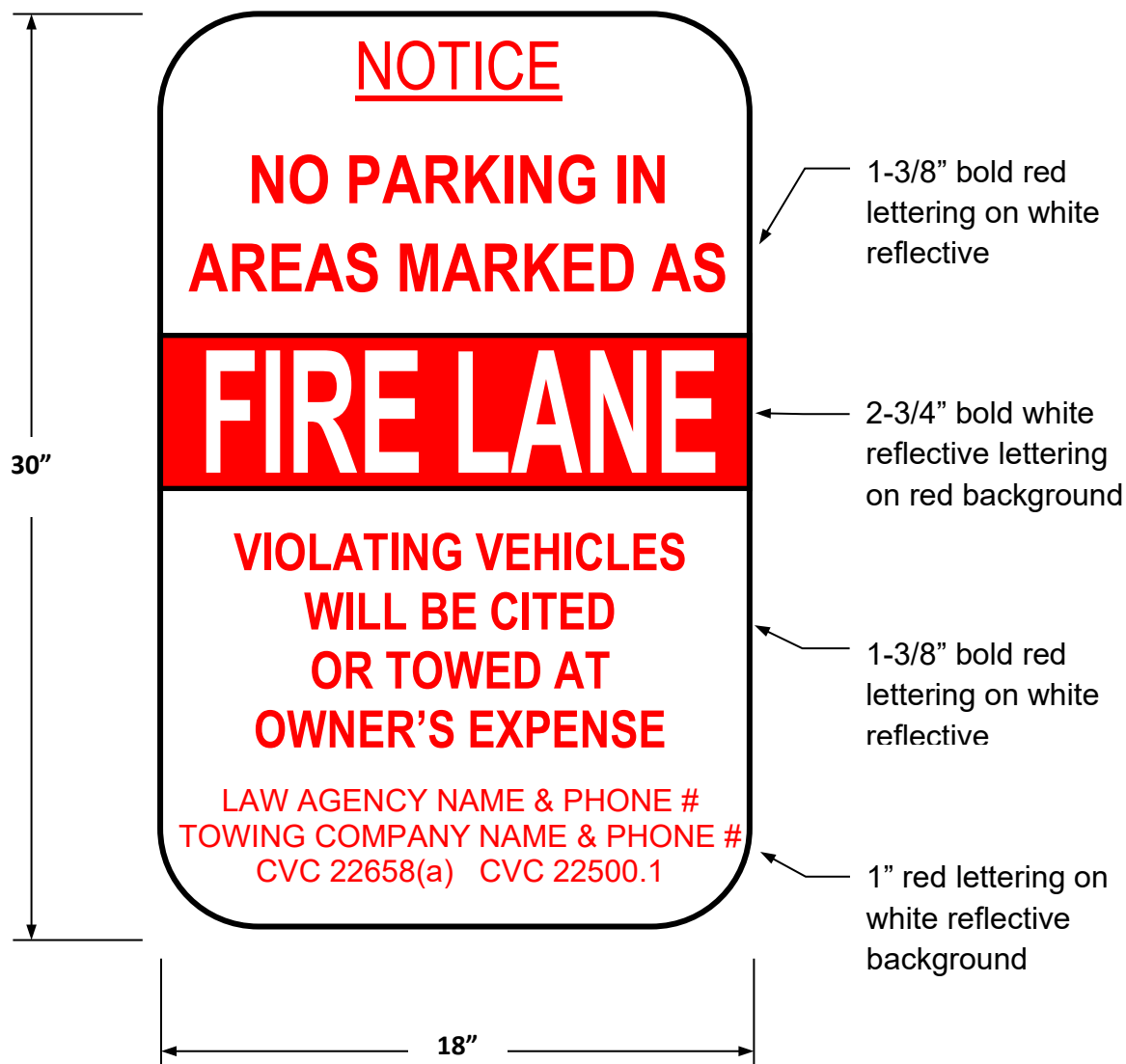


1. Fire lane entrance sign(s) shall be provided per Attachment 5.
2. Curbs shall be painted OSHA safety red.
3. "FIRE LANE – NO PARKING" shall be painted on top of curb in 3" white lettering at a spacing of 30' on center or portion thereof.

ATTACHMENT 5

Specifications for Fire Lane Entrance Signs

To be used only at *vehicle entry points*
to areas that contain “Fire Lane—No Parking” signs or red curb



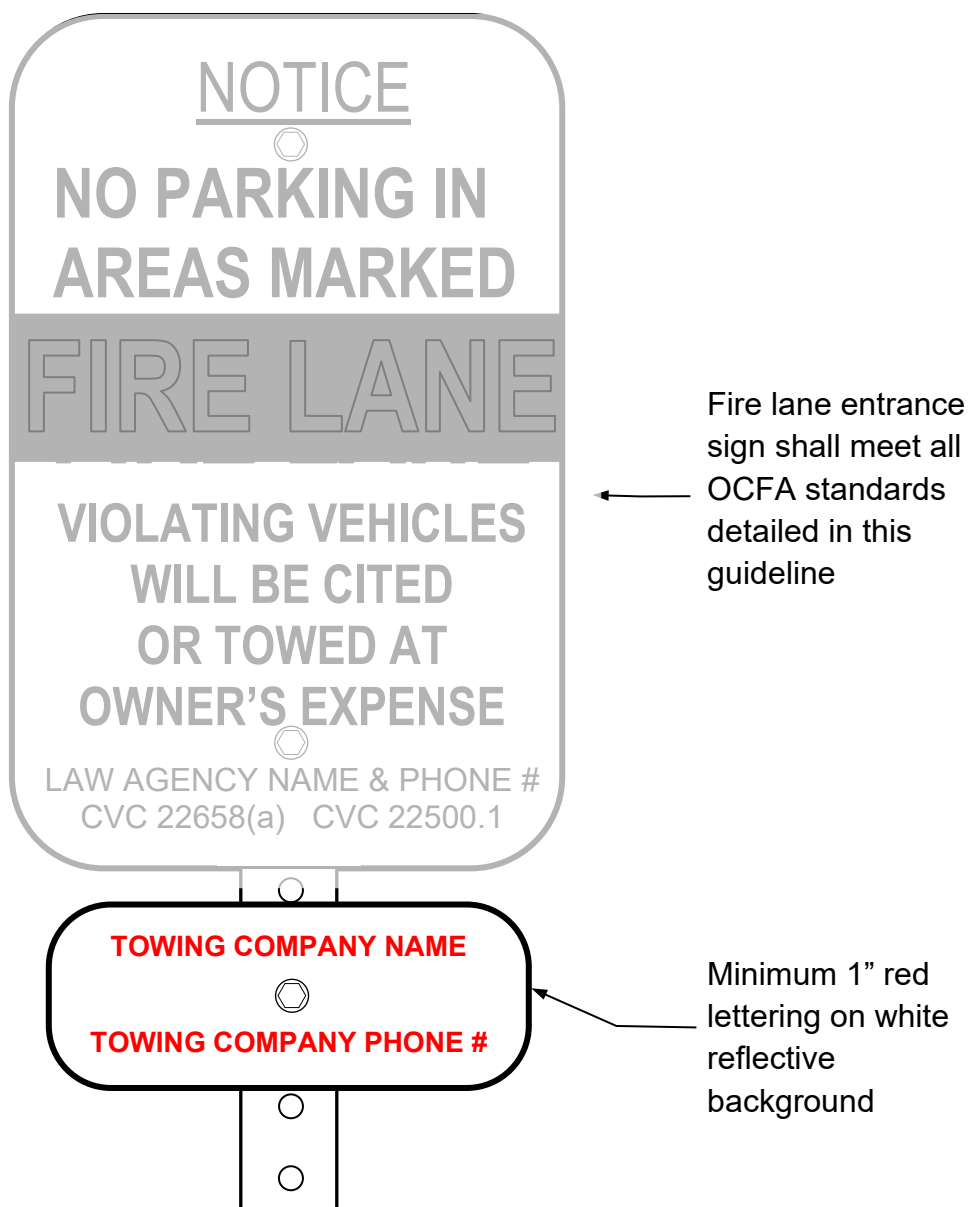
All sign and lettering dimensions shown are minimums. “Arial Narrow” font used in sample above, though other legible sans-serif fonts may be acceptable.

This sign shall be posted at all vehicle entrances to areas marked with either red curbs or fire lane “No Parking” signs. Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachments 6 and 8.

Towing company contact information is required for all properties with a standing written agreement for services with a towing company per the California Vehicle Code.

ATTACHMENT 5a

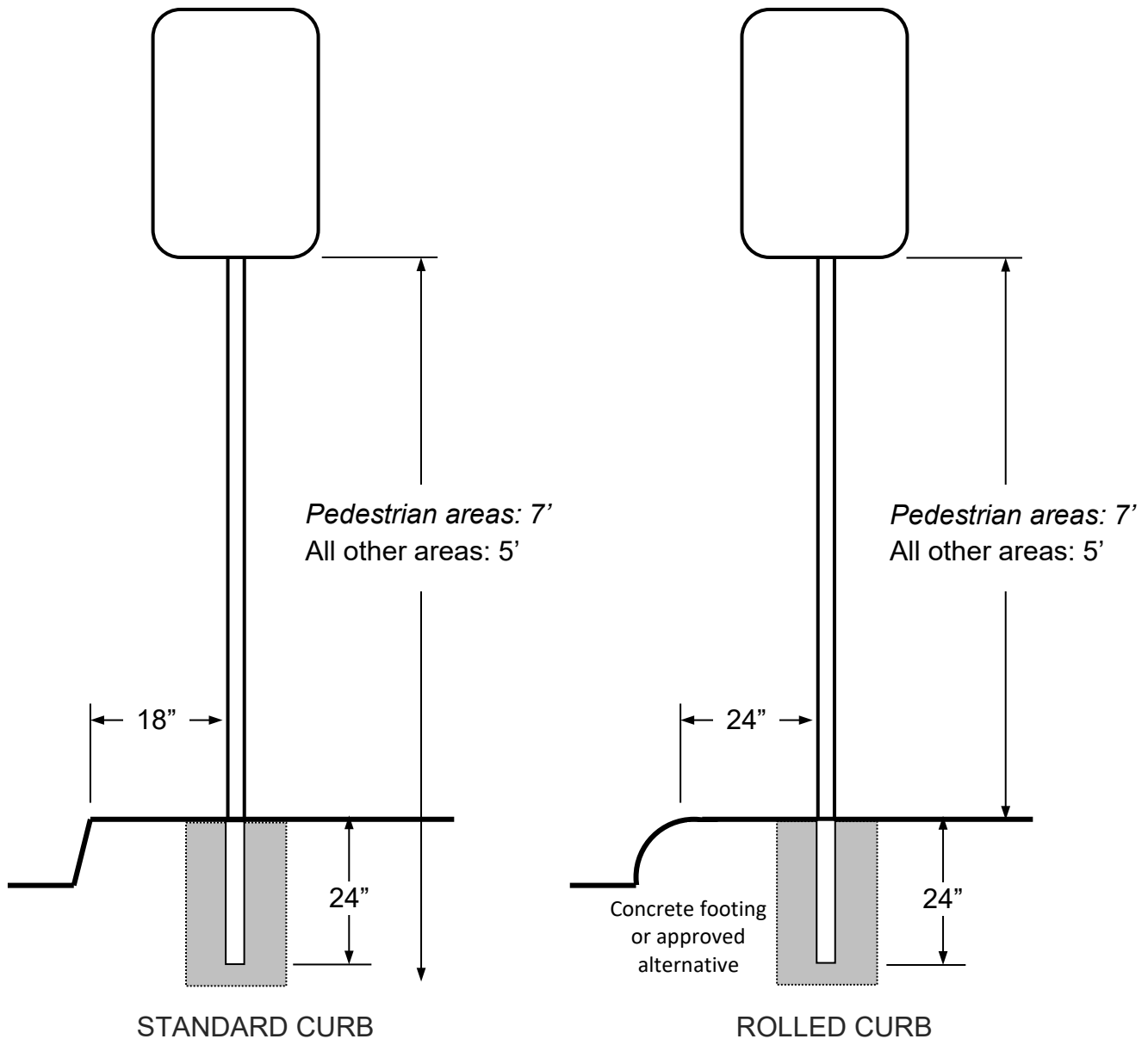
Specifications for Alternate Location of Towing Company Information



To facilitate periodic changes in towing company contracts, the towing company contact information may be posted on a separate sign mounted directly below the fire lane entrance sign instead of on the entrance sign itself. The method of attachment to the post shall not obscure the wording on either sign.

ATTACHMENT 6

Mounting Specifications for Fire Lane Entrance and No Parking Signs



Signs shall be mounted facing the direction of vehicular travel.

Signs may be mounted on existing posts or buildings where the centerline of the sign is no more than 24" from the edge of the roadway.

Depth of bury shall be a *minimum* of 24".

ATTACHMENT 7

Specifications for Fire Lane No Parking Signs



All sign and lettering dimensions shown are *minimums*. "Arial Narrow" font used in sample above, though other legible sans-serif fonts may be acceptable.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachments 13 and 14.

ATTACHMENT 7a

Specifications for Alternative Fire Lane No Parking Signs



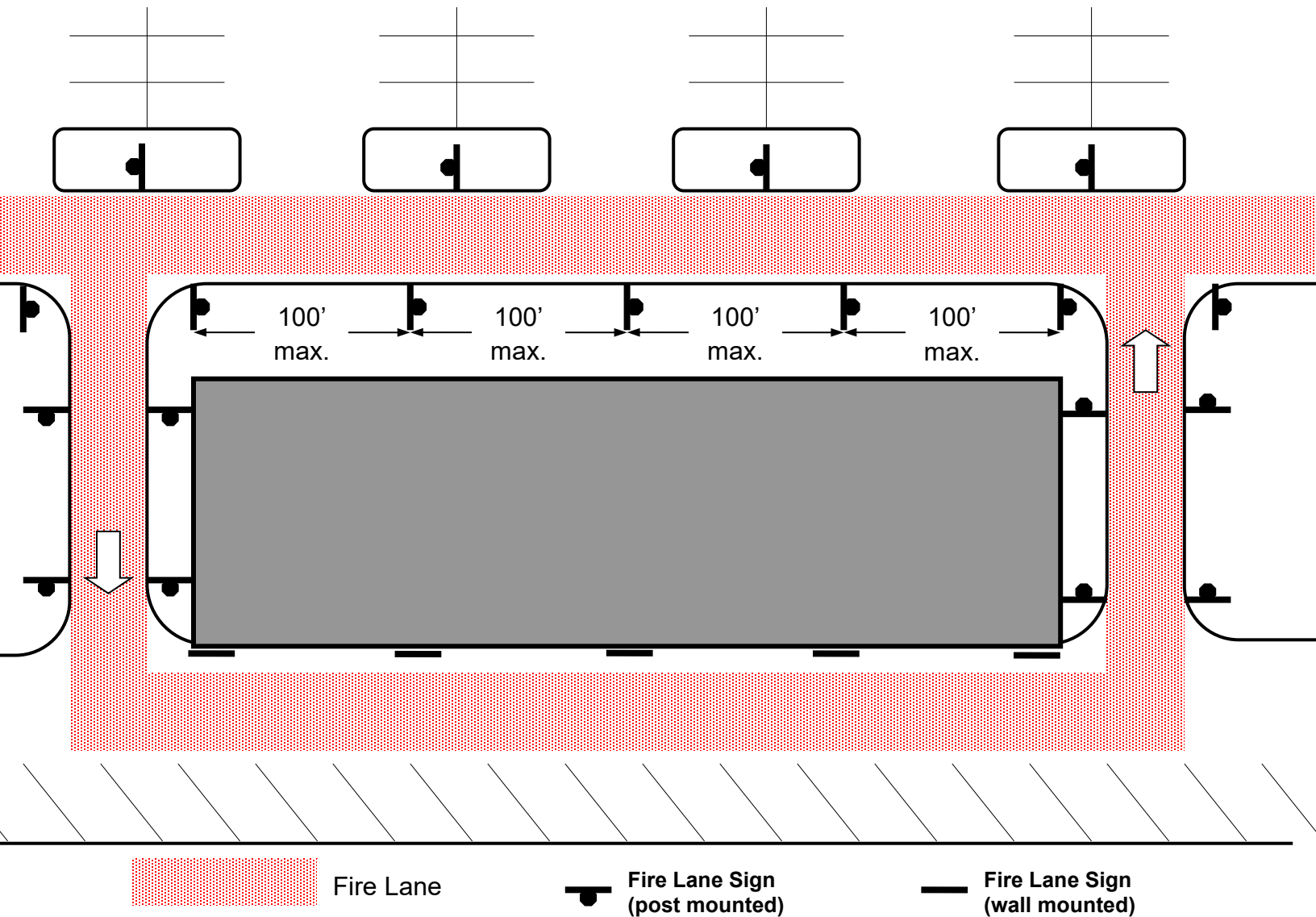
1" bold, condensed red lettering on white reflective background. Where parking stalls are not present, sign may omit "except in designated stalls" and sign height may be reduced to 18".

All sign and lettering dimensions shown are *minimums*. "Arial Narrow" font used in sample above, though other legible sans-serif fonts may be acceptable.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachments 6 and 8.

ATTACHMENT 8

Fire Lane No Parking Sign Locations

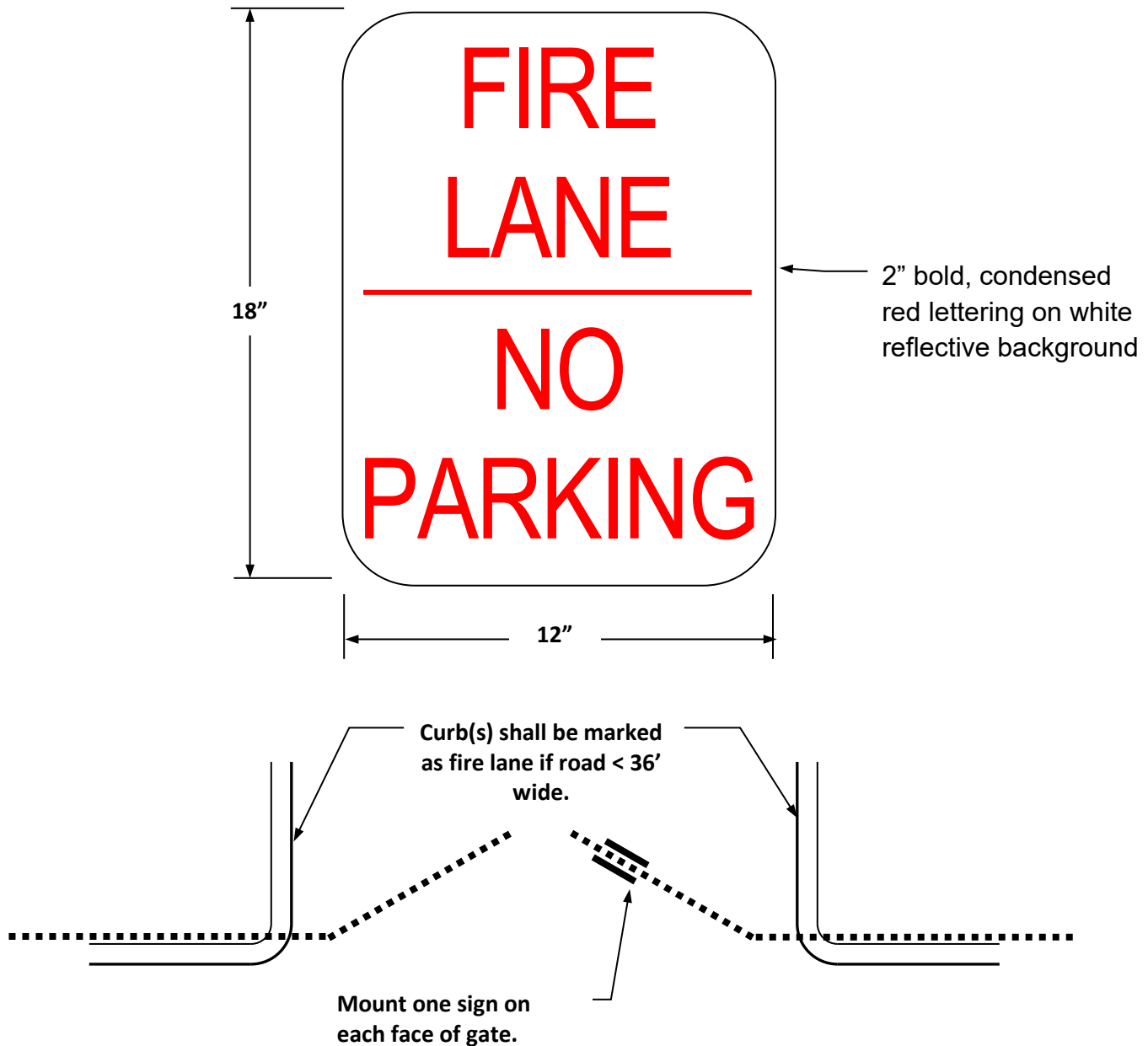


Signs are required within 3' of the end of each designated fire lane and spaced a maximum of 100' along the entire designated lane. One sign is required for each island adjacent to the fire lane.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and sign-posts shall be installed per Attachment 6. Where sign-posts are not practical, signs may be mounted on a wall or fence.

ATTACHMENT 9

Specifications for “Fire Lane - No Parking” Signs for Manually Operated Gates and Barriers



All sign and lettering dimensions shown are minimums. “Arial Narrow” font used in sample above, though other legible sans-serif fonts may be acceptable.

“Fire Lane—No Parking” sign shown in Attachment 12 may be used as an alternative.

Signs shall be securely mounted on the front and back face of the gate clearly visible to traffic entering the designated area. Signs shall be made of a durable material.

ATTACHMENT 10

CFC TABLE BB105.1: Minimum Required Fire Flow and Flow Duration for Buildings

FIRE AREA (square feet)					FIRE FLOW (gallons/min)		Flow
Type IA and IB	Type IIA and IIIA	Type IV and VA	Type IIB and IIIB	Type VB	unsprinklered	sprinklered	Duration
0-22700	0-12700	0-8200	0-5900	0-3600	1500	1500	2
22701-30200	12701-17000	8201-10900	5901-7900	3601-4800	1750	1500	
30201-38700	17001-21800	10901-12900	7901-9800	4801-6200	2000	1500	
38701-48300	21801-24200	12901-17400	9801-12600	6201-7700	2250	1500	
48301-59000	24201-33200	17401-21300	12601-15400	7701-9400	2500	1500	
59001-70900	33201-39700	21301-25500	15401-18400	9401-11300	2750	1500	
70901-83700	39701-47100	25501-30100	18401-21800	11301-13400	3000	1500	3
83701-97700	47101-54900	30101-35200	21801-25900	13401-15600	3250	1625	
97701-112700	54901-63400	35201-40600	25901-29300	15601-18000	3500	1750	
112701-128700	63401-72400	40601-46400	29301-33500	18001-20600	3750	1875	
128701-145900	72401-82100	46401-52500	33501-37900	20601-23300	4000	2000	4
145901-164200	82101-92400	52501-59100	37901-42700	23301-26300	4250	2125	
164201-183400	92401-103100	59101-66000	42701-47700	26301-29300	4500	2250	
183401-203700	103101-114600	66001-73300	47701-53000	29301-32600	4750	2375	
203701-225200	114601-126700	73301-81100	53001-58600	32601-36000	5000	2500	
225201-247700	126701-139400	81101-89200	58601-65400	36001-39600	5250	2625	
247701-271200	139401-152600	89201-97700	65401-70600	39601-43400	5500	2750	
271201-295900	152601-166500	97701-106500	70601-77000	43401-47400	5750	2875	
295901+	166501+	106501-115800	77001-83700	47401-51500	6000	3000	
		115801-125500	83701-90600	51501-55700	6250	3125	
		125501-135500	90601-97900	55701-60200	6500	3250	
		135501-145800	97901-106800	60201-64800	6750	3375	
		145801-156700	106801-113200	64801-69600	7000	3500	
		156701-167900	113201-121300	69601-74600	7250	3625	
		167901-179400	121301-129600	74601-79800	7500	3750	
		179401-191400	129601-138300	79801-85100	7750	3875	
		191401+	138301+	85101+	8000	4000	

Construction Types are based upon the California Building Code base construction type without construction equivalency for sprinklers.
Fire flow measured at 20 psi.

ATTACHMENT 11

CFC TABLE CC105.1: Number and Distribution of Hydrants

FLOW REQUIREMENT from Table BB105.1	Minimum # of Hydrants	Average Hydrant Spacing (feet) ¹	Maximum Distance to Hydrant (feet) ²
up to 1750	1	500	250
1751-2250	2	450	225
2251-2500	3	450	225
2501-3000	3	400	225
3001-4000	4	350	210
4001-5000	5	300	180
5001-5500	6	300	180
5501-6000	6	250	150
6001-7000	7	250	150
7001+	8 or more ³	200	120

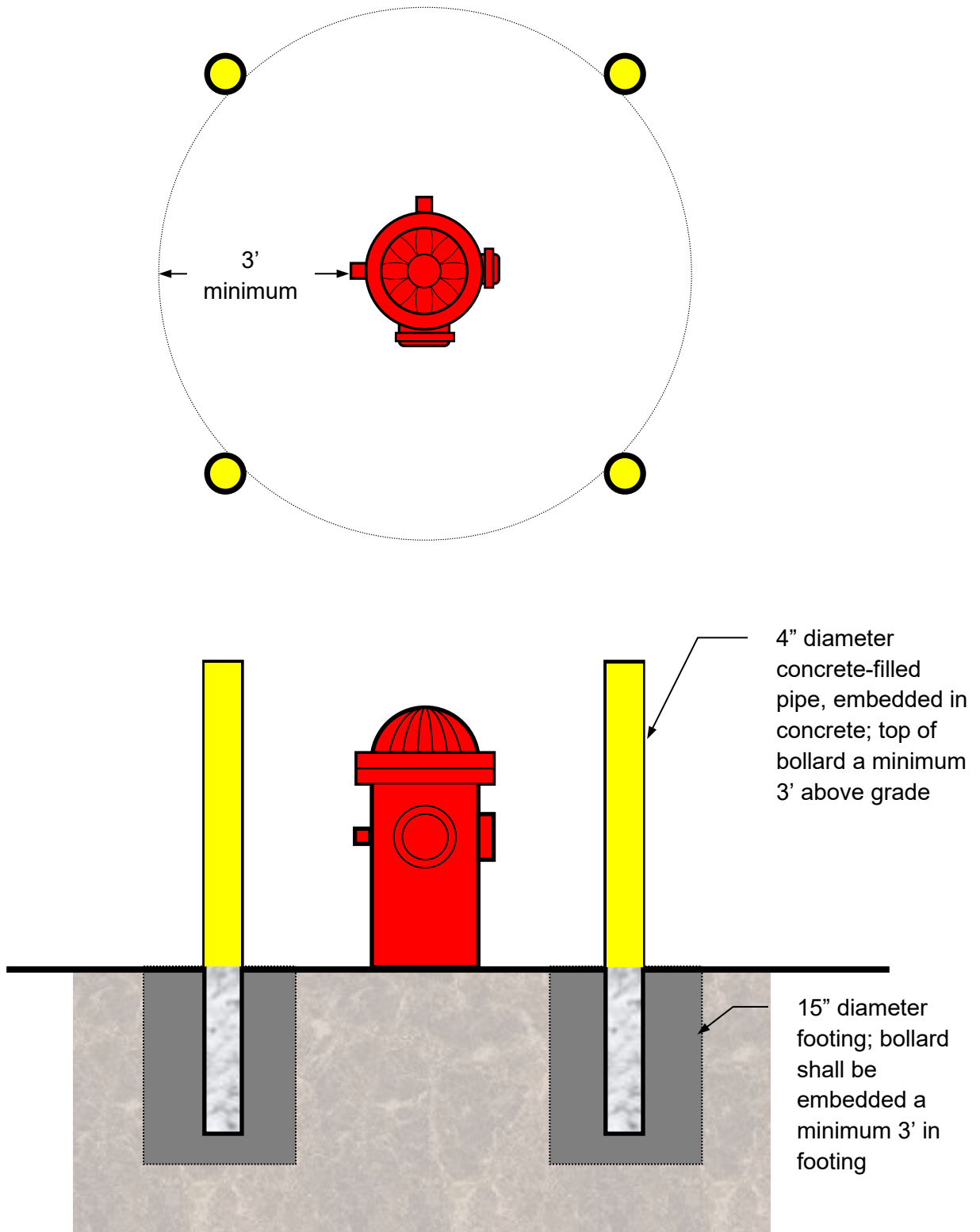
¹ Reduce by 100 feet for dead-end streets or roads.

² Reduce by 50 feet for dead-end streets or roads.

³ One hydrant for each 1,000 gallons per minute or fraction thereof.

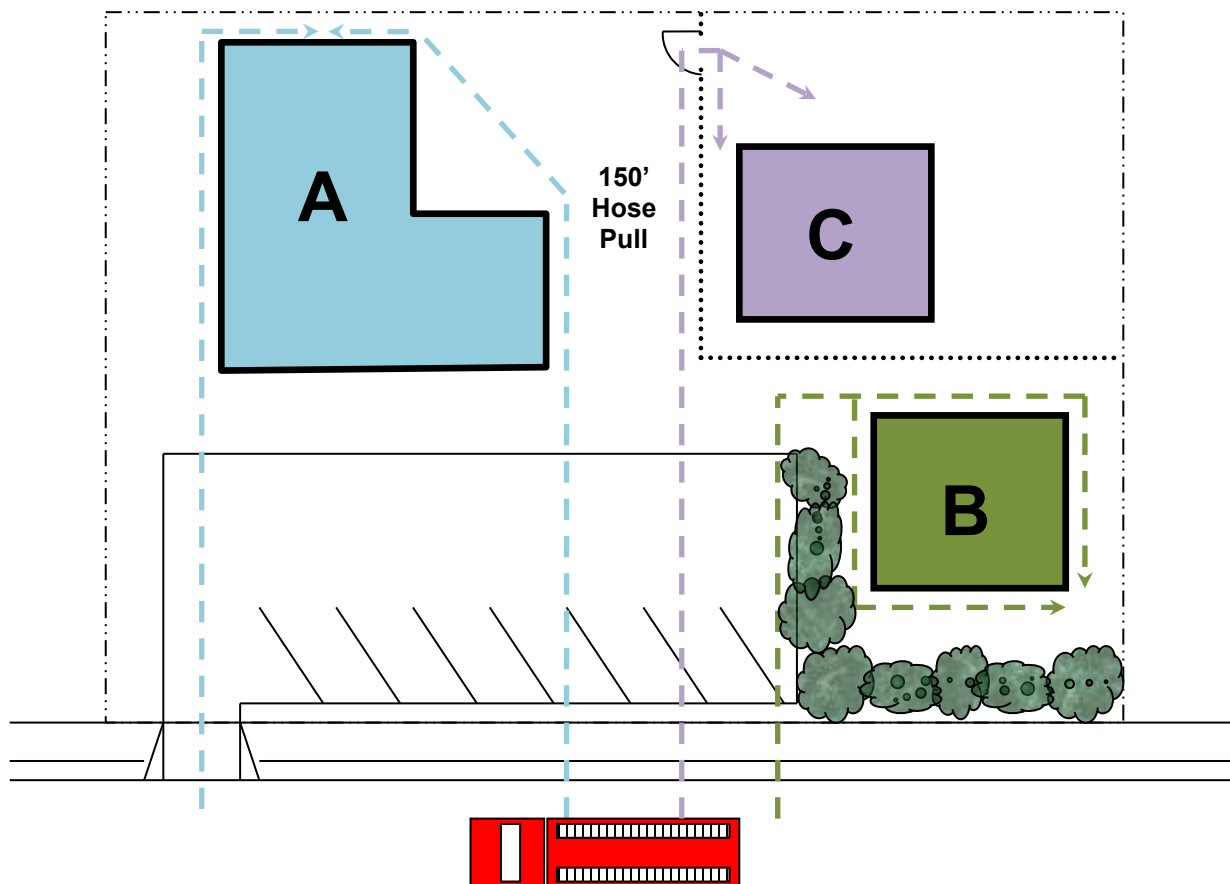
ATTACHMENT 12

Protection of Hydrants, Detector Checks, Fire Department Connections, and other Appurtenances



ATTACHMENT 13

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 access despite the obstruction presented by the planter and hedges.
- Building “C” is out of access; the presence of a chain link fence forces firefighters to backtrack once they pass through the gate, increasing their travel distance beyond 150 feet. On-site fire access roadways or a change in the location of the gate and would be necessary to provide access to Building “C”.

ATTACHMENT 13a

Hose Pull vs. Hose Lay

A: Hose Pull (Distance from Engine to Building): Represents the amount of fire hose that firefighters must pull from the engine to reach the structure. Hose pull may not exceed 150'. In the diagram below, firefighters would be able to reach the building by pulling no more than 150' of hose from one or more fire engines staged in the shaded portion of the fire lane. For hydrant evaluation purposes, this part of the fire lane is considered to serve the building and must meet hose lay requirements. See Attachment 13 for further information on hose pull measurement and access to structures.

B: Hose Lay (Distance from Engine to a Hydrant): Represents the amount of supply hose that must be laid out of the back of the engine to bring water from the hydrant to the engine. No point along the portion of the fire lane serving the structure (the shaded road) may be farther from a hydrant than the distance specified under “Maximum Distance” in CFC Table CC105.1 (see Attachment 11). The hydrant may be located along portions of the fire lane that exceed the hose pull distance provided that it is 1) on the same property, 2) on an adjacent property where an emergency access easement has been obtained, or 3) on a public road leading to the fire lane serving the property. Hose lay is measured along the vehicle path of travel in the fire lane, not “as the crow flies.”

C: Hydrant Spacing (Distance between Hydrants): The distance between hydrants serving the building shall not exceed twice the “Maximum Distance” listed in CFC Table CC105.1, as measured along the fire lane. Hydrants located on portions of the fire lane that do not serve the building do not need to be evaluated for spacing relative to each other, only with respect to hydrants that do serve the structure. For example, when evaluating hydrant placement for the building shown in the diagram below, C₁ may exceed the hydrant spacing requirements, while C₂ and C₃ cannot. The “Average Spacing” from Table CC105.1 shall be maintained to prevent multiple hydrants from being concentrated in only one portion of the fire lane.

