



Rodeo – Hercules Fire Protection District

Guidance and Requirements for Commercial & Residential Development



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Guidance and Requirements for Commercial and Residential Development

PURPOSE

This document is a general guideline for submittal and review of architectural plans to the Rodeo-Hercules Fire Protection District (RHFPD). Contained within this document is guidance related to submittal requirements, general information required on the plans, standard architectural notes, and specific requirements by occupancy type. Also contained within this document is clarifying information on generally excepted practices and expectations as related to development within the Fire District.

The items identified in this guideline are not intended to cover all of the various code requirements that apply to architectural plans reviewed by the RHFPD. Relevant adopted codes and standards and interpretive manuals and other guidance documents pertaining to building design and construction will still be required.

SCOPE

The RHFPD reviews architectural plans for those structures that, because of the nature of their occupants, use, height, or processes and materials contained within, have an inherently higher potential to endanger life or the community due to the risk of fire, panic, or other emergency conditions. RHFPD reviews architectural plans to ensure that these structures and the people occupying them are sufficiently protected by the proper type of construction and fire-resistive assemblies, fire and life-safety systems, and egress systems as required by the relevant codes and standards.

These guidelines apply to all structures built, modified, or moved into the area served by the RHFPD over which the RHFPD has jurisdictional authority granted by the State Fire Marshal (SFM) for compliance with life safety requirements detailed in the California Building Code (CBC), California Fire Code (CFC), and other adopted standards and regulations.

Additionally, the RHFPD reviews architectural plans for the installation of electronic locks where the devices potentially affect travel in the direction of exiting from a building, tenant space or where such devices are required to be interconnected with sprinkler and alarm or smoke detection systems (e.g., access-controlled egress systems, delayed egress locks, elevator lobby locks). Installation of card readers that only prevent authorized access into a building or space against the direction of exit travel wont by itself trigger submittal of architectural plans to the RHFPD.

DEFINITIONS

Many terms used within this guideline and in correction letters issued by RHFPD are defined specifically in Chapter 2 of the CBC and CFC and further clarified throughout the code by the context in which they are used. In some cases, terms may convey a specific meaning when used by design, construction, and code enforcement professionals that may vary from everyday use. The following definitions are provided to facilitate the consistent application of this guideline and to aid in clear communication between applicants and RHFPD staff:

CBC- California Building Code

Certification – A declaration by the State Fire Marshal’s office, testing lab, registered engineer, or other agency or individual approved by the RHFPD that a product is suitable for the intended use or meets specific testing or listing criteria.

CFC- California Fire Code

Chemical Classification/Chem Class – An inventory of the hazardous materials stored or used at a facility or site. A hazardous material is defined as any liquid, solid, or gas that is required to have a safety data sheet or SDS. The chemical classification does not need to include common products intended for routine cleaning and maintenance of the facility itself, such as glass cleaner, floor polish, and the like, reasonably expected to be found in limited quantities in all structures. *Please visit Contra Costa Hazardous Materials Program (CCHMP) online at cchealth.org/hazmat for more information.*

City- The City of Hercules (111 Civic Drive, Hercules, 94547) (510) 799-8200

Convenience Doors, Non-required Doors – Additional doors beyond the minimum required to meet code that are installed to facilitate the use of the room for its intended purpose. Doors that are not required by code for egress purposes but may still serve as part of a legitimate egress path must comply with the exit door requirements of CBC 1008.

Corridor, Hall, or Hallway – A defined circulation space having wall and ceiling/floor assemblies. Doors, windows, and other openings into corridors may or may not be required to be of rated construction depending on the occupancy and number of persons served by the corridor and whether the building is protected throughout by fire sprinklers or other code requirements. Other spaces that essentially function as corridors but may not be completely enclosed by wall and ceiling/floor assemblies, as is the case for many interior and exterior egress paths, shall be treated as a corridor for purposes of determining minimum width.

County- Contra Costa County Department of Conservation and Development (30 Muir Road, Martinez, 94553) (925) 674-7200

Daycare – A facility or area providing supervision or custodial care of individuals who, due to age, mental state, or other conditions, have their ability for self-preservation limited or impaired or who evacuate at a slower rate than the general population. Daycare uses may include facilities such as non-

residentially-based babysitting or adult care, services for the disabled, Alzheimer’s facilities, nurseries and preschools, or facilities licensed by the State or local jurisdiction as a daycare or day program facility. These facilities are typically classified as E or I-4 occupancies depending on the number and age of occupants when the occupants are on-site for a period of less than 24 hours or as R occupancies when 24-hour service is provided. Sports training, dance schools, and similarly focused recreational programs where children are on site only for the duration of the training session itself and do not receive other supervision or care services are usually considered an A-3 occupancy if more than 49 occupants are present. See also Nursery.

Exit Access Doors/Exit Doors/Egress Doors – doors and doorways required by the CBC that allow travel from a space or structure. Such doors shall meet all of the requirements of the CBC, such as quantity, placement, size, door swing direction, and hardware.

FDC – Fire Department Connection

Legitimate Egress Path – a path of travel from a space to the public way or safe dispersal area that complies or can feasibly be designed to comply with the egress requirements of CBC Chapter 10. Paths of travel may still qualify as legitimate egress paths though they may not be required egress paths. Because many potential egress paths that are not required by code are indistinguishable from required ones and can be expected to be used by occupants in an emergency situation, they shall meet the applicable provisions of required egress paths whenever possible; for example, every door serving occupants of an assembly that is part of a legitimate egress path to the public way shall be equipped with panic hardware.

Letter of Intended Use – *A letter provided by a building or business owner detailing the anticipated uses of the structure or space or identifying the types of processes, equipment, or materials used in a facility.* Such letters assist in defining the appropriate occupancy- or use- related requirements for a project and may include diagrams or plans such as furniture or equipment layouts. Such letters may also establish the conditions of use that approval by the RHFPD is based.

Lobby – *A room located at the entrance of a building that occupants pass through to access other spaces within the structure.* Unlike a waiting or reception room, a lobby generally does not serve any use other than circulation. Where lobbies are required to be of rated construction, they shall contain only minimal amounts of combustible furnishings and fixtures, such as an information desk or directional kiosk, and shall not be used for purposes such as a lounge or waiting room.

Normally Occupied Space – *rooms or areas that are occupied frequently throughout the day or intermittently for extended periods during the normal course of operation of a facility.* Such areas may include offices, conference rooms, break rooms, copier rooms, restrooms, warehouses, file rooms, and similar accessory or administrative areas, but do not normally include supply or storage rooms, janitorial closets, or mechanical rooms.

Nursery – *a facility for the care of infants and children younger than two years.* See also Daycare.

Occupancy Classification or Occupancy Type – *the classification of a structure or portion thereof based on the use or type of occupants.* The occupancy groups can be referenced in Chapter 2 of the California Fire Code.

Preschool – *a facility for the care and/or education of small children not yet old enough to enter kindergarten, typically under 5 years of age. See also Nursery and Daycare.*

Public Way – *a street, alley, sidewalk, plaza, or other area permanently dedicated to the general public for their use. Egress requirements typically end at the public way as it is substantially open to the sky, providing safety from smoke inhalation, and offers an opportunity for the occupants of a structure or other space to freely disperse from danger in the event of a fire or other emergency.*

Room/Space – *an area where travel is constrained or where smoke, fire, or panic may present an immediate hazard. A place or space may include exterior areas such as a balcony, terrace, or patio enclosed by fences, walls, vegetation, or other obstructions. Two areas that are adjacent to each other but visually, physically, acoustically, atmospherically, or functionally separated may be considered by the fire code official for purposes of code application to be either the same or separate spaces, dependent upon the degree and/or type of separation and how these may potentially affect the occupants in an emergency.*

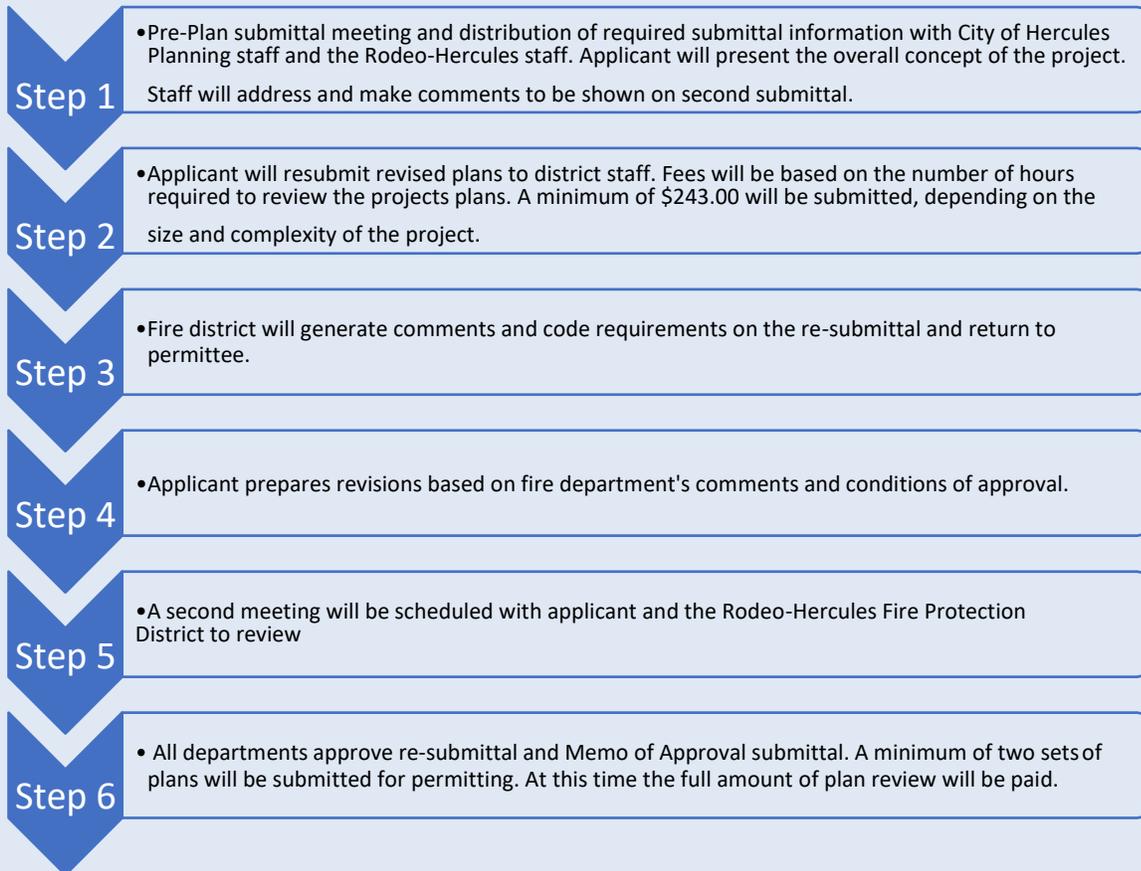
Rescue Openings – *Exterior doors/windows required in sleeping rooms of certain R occupancies to facilitate evacuation or rescue of occupants. Any area provided with a closet or storage space or ensuite bathroom that could easily be converted into a sleeping room, such as a “bonus room,” “den,” or “home office,” shall be considered a sleeping room when considering rescue window requirements.*

Safe Dispersal Area – *an area that allows the occupants evacuating a structure to maintain a safe distance from the structure without actually leaving the property and traveling to the public way.*

Structure/Building – *a construct intended to house or contain people, equipment, objects, or processes, within which travel is constrained, or where smoke, fire, or panic may present an immediate hazard. A structure or building may or may not have a roof or be enclosed with walls.*

FIRE PERMIT PLAN REVIEW PROCESS

The Rodeo-Hercules Fire Protection District’s Prequalified Architectural Submittal System is a training and document approval program, conducted by both the City of Hercules and the Fire District, which instructs participating organizations on how to implement a defined system of document standards that make for relatively uniform building plan documents. Documents that utilize these standards are much easier to review, and in turn provide a rapid approval process.



REQUIREMENTS

The information in this section is divided into three main topics:

1. Submittal Process
2. Plan Requirements
3. General Code Requirements

Though the submittal process is relatively similar for all types of plans submitted to the RHFPD, there are some variations for architectural plans, so all applicants are encouraged to read the Submittal

Process section. As necessary required plan information can vary between RHFPD and other jurisdictions, the Plan Requirements section should be reviewed by all applicants who have not submitted architectural plans to the RHFPD. The two Code Requirements sections focus on issues that are commonly cited as corrections during the review. Explanatory information is included to answer frequently asked questions; provide guidance for areas of the CBC and CFC that are not universally applied or understood; describe code requirements in more depth than allowed for in a correction letter, and promote a uniform application of code and life-safety standards by designers and RHFPD staff. As such, the Code Requirements sections are recommended for individuals who may not be familiar with CBC and CFC requirements or RHFPD’s application thereof, as well as architects receiving corrections on their plans.

Applicants are encouraged to read the applicable portion(s) of this guideline prior to making corrections or contacting RHFPD Planning & Development staff for clarification. Definitions to some commonly used terms appearing in this guideline or on correction letters are available for reference in the preceding section.

Submittal Process

1. Sequencing – For typical projects consisting of a new structure or an addition/modification to the footprint of an existing structure, a fire master plan shall be reviewed and approved by the RHFPD prior to the submittal of the architectural plan. For projects within the footprint of existing structures, the architectural plan may be submitted after completion of the city’s conditional use permit or design development review process.

As the contents, equipment, or processes taking place within a structure may affect construction or egress requirements, any review of hazardous materials, equipment, or processes shall take place either before or concurrently with the architectural review. Standard hazards/equipment shall be shown on the plan.

2. Payment – Refer to the RHFPD Plan Review/ Services Fee Schedule at rhfd.org for current fees related to the review of architectural plans. Architectural plan fee codes are found on the Fee Schedule. If you are unable to determine the correct fee code to use, please contact RHFPD for assistance at 510-799-4561.

Fees for the type of review requested will be due upon submittal. This fee covers the cost for the time it takes on average to complete the first two plan reviews and a predetermined number of inspections (usually two) for a typical project. The fee also covers a minimal amount of time needed to discuss the project with the applicant at the counter or over the phone or email. Additional fees may be due for the extra time necessary to conduct sit-down meetings, complete complex reviews, or for time-intensive or additional inspections such as those involved with extensive facilities, phased projects, or where fees for plan review and inspections are assessed on an hourly basis.

Also, as fees are based on the type of occupancy being reviewed, discrepancies between the occupancy listed on the plan or fee code selected and the actual occupancy or occupancies present may result in fees being adjusted to reflect the full scope of the review. Any additional fees accrued on a Service

Request during the course of review will be due upon pick-up and/or resubmittal of the plan as determined by RHFPD and, if applicable, City/County staff. Please note that the City/County may also assess a separate processing or handling fee for projects that are not submitted to and picked up directly from the RHFPD; please check with the respective Building Departments prior to submitting plans to them.

3. Number of Plan Sets – A minimum of two hardcopies and any additional supporting information are required by the RHFPD at the time of submittal. However, due to their complexity, most architectural plans typically require additional, submittals to address various deficiencies or receive supportive information necessary for approval. As large plan sets can be expensive to produce and cumbersome to transport and handle, the RHFPD allows the submittal of only a single hardcopy plan for review on the first submittal for all projects other than simple tenant improvements, minor revisions to previously approved plans, or plans that are submitted for review over-the-counter.

Additional Documents Submitted With Plans:

- a. A single copy of the correction letter issued by the RHFPD for the previous submittal.
- b. A single copy of a correction response letter from the applicant indicating the type and location or sheet number for each change made to the plan. Alternatively, the responses may be made in the margins of the RHFPD correction letter. Plans submitted without this information may be delayed or returned as incomplete without review.
- c. Any supporting documentation requested in the correction letter. Where appropriate, such as for a letter of intended use, certification, or other document justifying or explaining the validity of the project or design, the documentation shall be scanned or photocopied directly onto the plans.
- d. Any fees due, such as those assessed on a third submittal or for additional work under the scope of the Service Request, which was not paid initially.

Plan Requirements

The following plan sheets are typically needed for RHFPD architectural review:

1. Title/project information sheet
2. Site plan, or for existing buildings, a scaled or dimensioned plan showing the location of the project relative to other structures, property lines, fences, exterior egress elements, etc.
3. Floor plan(s), dimensioned or drawn at a standard architectural or engineering scale
4. Reflected ceiling plan or electrical/lighting plan showing the location of exit signs and emergency lighting fixtures
5. Door/window schedules identifying size, fire rating, and type of lock and hardware (e.g., panic hardware, electronic locks, deadbolts, door closers, and smokegaskets)
6. Manufacturer's specification sheets for any decorative materials used (highlight the State Fire Marshal's certification or flame spread rating) or similar documentation for other special components.

7. Details showing the rise/run of stairs and ramps, if any.

Depending on the complexity of the project, additional information such as building elevation, section, or detail drawings and equipment and furniture layouts may also be required to provide a comprehensive view of the project. Typically, submittal of plumbing, structural, mechanical, Title 24 energy compliance, and ADA compliance information to the RHFPD is not necessary to complete an architectural review. If additional information is required, it will be requested during the review process. To simplify the approval process and eliminate unnecessary paper waste and reprographic time and expense, much of the required information identified above may be combined onto one or two fire protection and code analysis sheets. See Attachment 1 for a more detailed description of the specific type of information required. See Attachment 2 for our submittal checklist.

General Code Requirements

The information provided in this section generally applies to all projects and is provided to clarify the requirements in CBC Chapters 5, 10, and 30 as enforced by the RHFPD.

1. Occupancy Separation

Where identified by CBC Table 508.4, occupancies of different types shall be separated by fire barriers and rated floor/ceiling assemblies unless the occupancies either qualify as accessory spaces or are treated as non-separated. Indicate on the plan whether the building or space under review will be treated as separated or non-separated, and identify all accessory and incidental use spaces on the plan.

A. Non-separated Occupancies, CBC 508.3 – When using the non-separated provisions in exchange for the elimination of rated separations required by Table 508.4, the non-separated areas will be treated as the most stringent occupancy present for purposes of determining allowable area, sprinkler and alarm requirements, and other life-safety provisions in CBC Chapter 9. The non-separated approach is the most beneficial in:

- 1) small buildings where none of the occupancies require sprinklers or alarms
- 2) larger buildings where the allowable area for each occupancy type is similar, or where the allowable area for the most restrictive occupancy is larger than the actual size of the building
- 3) fully-sprinklered buildings where the alarm requirements for each occupancy are similar (e.g., E, I-4, and large A occupancies), or where alarms are not required in any occupancy in the building
- 4) projects where the design calls for many windows, doors, ducts, or other openings between different occupancies
- 5) projects where extension of the sprinkler or alarm system is less expensive or more practical than the installation of rated separations.

Non-separated spaces retain their original occupancy classification and are still subject to specific requirements based on occupancy, including that for rated construction, found elsewhere in the code, such as the need for I-1, R-1, R-2, R-2.1, and R-3 dwelling and sleeping spaces to be separated from each other and adjacent spaces per CBC 420 or the need for rated wall or ceiling/floor assemblies identified in CBC Chapter 7 or 10. Due to the increased hazards inherent in H and L occupancies, these spaces shall always be separated as required by Table 508.4. Due to the nature of the occupants in I-2, I-2.1, I-3 occupancies, these spaces may also require separation from certain occupancies in some types of construction– see CBC 508.3.3 Exception 3.

If the non-separated approach is used, identify the areas or occupancies it applies to and provide the following note on the plan: “For non-separated spaces, sprinkler, alarm, and other life-safety system requirements of CBC Chapter 9 shall be applied throughout the non-separated areas as required for the most stringent of the non-separated occupancies present.” Where the allowable area is significantly different for the various non-separated occupancies, provide an allowable area calculation (see section 3.E) based on the lowest tabular value from Table 506.2 for the occupancies that are non-separated.

B. Accessory Occupancies, CBC 508.2 – The CBC allows spaces that would typically be required to be separated from other occupancies by fire-resistive walls and ceiling/floor assemblies to omit these rated separations provided that they qualify as accessory occupancies. A space may be eligible as an accessory occupancy if it meets all of the following criteria:

- 1) Accessory space shall not be more than 10% of the area of any floor.
- 2) The aggregate area of all accessory spaces in the building shall not exceed the allowable base area for non-sprinklered buildings listed in Table 506.2 without increases due to the presence of sprinklers or frontage.
- 3) The space is ancillary to, directly associated with, functionally interdependent upon, and under the direct control of the main use and would not otherwise take place independently. For example, the administrative office at a school or a cafeteria serving the employees of a factory could be accessory to the primary occupancy, but a coffee-shop leasing space in a strip mall and serving the general public would not be accessory to the other B or M occupancy spaces in the building.
- 4) The room is used for purposes or by persons who are expected to be associated with the main use of the building. For example, a meeting or activity room at a city hall that is used for civic functions and city-sponsored or supervised events would be an accessory to the offices.
- 5) The space is not used for a purpose that could reasonably be expected to take place independent of the primary use. For example, a daycare located in an office building that is used by people other than employees would not be an accessory. Similarly, a daycare operating at a place of religious worship that cares for children whose guardians are not concurrently attending religious services or functions would not be considered accessory.
- 6) The space is occupied outside of the regularly scheduled hours of use for the rest of the facility. For example, a multipurpose room at a civic center that is available to the general public in the evenings or weekends for private functions would not be considered an accessory to the rest

of the civic center.

For purposes of calculating allowable area only, accessory occupancies are treated as the main occupancy they are accessory to; for all other purposes, such as sprinkler and alarm requirements, egress, maximum stories, etc., they retain their original occupancy classification. If the accessory occupancy provision will be used, note which space(s) it applies to and provides a calculation demonstrating that the accessory spaces occupy less than 10% of the floor area of the individual stories they are located on.

C. Incidental uses, CBC 509 – The California Building Code recognizes that some spaces in a building are inherently more hazardous than others and require that they be appropriately separated from other spaces with rated construction, protected by fire sprinklers, or both. Incidental uses shall be protected as required in Table 509 even if they would otherwise qualify as an unseparated accessory space. Where the option is available to provide sprinkler protection in the place of rated construction, construction shall still be capable of resisting the passage of smoke. Where applicable, call this out on the plan and note automatic closers and smoke gaskets on the door schedule.

Unlike accessory uses, incidental use spaces assume the occupancy of the part of the building they are located in and are not given an occupancy classification based on the use they most closely match from the list in CBC 302.1. For example, an incidental use laundry room in a hotel would be classified as R-1 and not F-1.

The aggregate area of incidental use spaces shall not be more than 10% of the area of the story they are located in. Where they do exceed this limit, they shall be treated as separated occupancies and be provided with the protection and/or separation as required by CBC Table 509 or 508.4, whichever is greater.

2. Building Height, Construction, & Allowable Area

A. Sprinkler Upgrades – The California Building Code allows a building’s area, height, and maximum stories above grade permitted for each occupancy to be increased by the installation of an approved fire sprinkler system. If these provisions are applied to a project, the sprinkler system shall comply with NFPA 13. With the exception of R-2 occupancies of Type V-A construction, sprinklers cannot be used for both a story/height increase and an area increase in buildings or portions of buildings classified as an A, E, H, I, L, R occupancy or high-rise building. See footnotes ‘n’ and ‘o’ in CBC Table 504.4 and ‘i’ and ‘j’ in Table 506.2 for limitations on using sprinklers for height/story and area increases.

B. Allowable Area – The maximum size that a building is allowed to be is primarily dependent upon the type of construction used, the occupancies housed in the building, and whether the building is sprinklered. To demonstrate compliance with allowable area restrictions, an allowable area calculation done in accordance with CBC Equations 5-1 through 5-5 is required to be provided on the plans for any new structure meeting any of the following criteria:

- 1) Any building containing an H occupancy

- 2) Any non-sprinklered building over 6,000 sq. ft. containing an A occupancy
- 3) Any non-sprinklered building over 9,000 sq. ft.
- 4) Any building using sprinklers for a story increase or construction equivalency

For existing structures, an allowable area calculation is required when there is a change in occupancy to a more restrictive classification (e.g., from B or M to an A) and the building meets any of the criteria in the list above.

C. Frontage – a building with at least 25% of its perimeter located at least 20 feet away from property lines or other structures on the same lot may qualify for an increase in allowable area. The open space shall be:

- 1) located on the same property as the building or in a permanently dedicated public open space such as a street or park, and
- 2) accessible from a non-site fire lane or public road serving as a fire lane, and
- 3) available for and facilitate firefighting and rescue operations.

Examples of spaces that do not qualify for frontage increases include:

- Open land on adjacent private property, unless an open space easement is recorded against the adjacent property
- Railroad right-of-ways
- Freeways and other high-speed, high-volume streets
- Open space that is separated from the building and made inaccessible by walls, fences, vegetation, topography, or other obstructions
- Open space that is not immediately and readily accessible from a fire lane or public road (i.e., beyond 150' hose pull distance from the fire lane)
- Rivers, ponds, and other bodies of water not passable by foot
- Areas where vegetation, terrain, trellises, outbuildings, walls, and similar obstructions impede travel, hose streams, or use of ladders or other firefighting equipment or operations.
- Outdoor equipment or materiel storage or staging areas
- Parking areas for trucks, busses, and other large vehicles

4) Frontage increases shall be calculated using CBC Equation 5-5. The maximum frontage increase for most buildings with at least 30 feet of open space along the entire perimeter is 50% of the allowable base area for a non-sprinklered building shown in CBC Table 506.2. The full width of open space between buildings on the same property may be used for each of the buildings when calculating frontage.

3. Occupant Load

A. Occupant load factors – Refer to CBC Table 1004.1.2 and the occupancy- specific sections of this guideline for the appropriate occupant load factor (e.g., square feet per person) for each space. If a space has more than one type of use or more than one occupant load factor is appropriate, select the factor that results in the greatest number of occupants.

The occupant load determined in accordance with CBC 1004 is the “design” occupant load of the space and anticipates a worst-case situation from a life-safety perspective. It is the figure that is used by the fire prevention department as the basis for:

B. Concurrent occupancy – For purposes of designing the egress system, all spaces except restrooms and defined circulation spaces will be assumed to be occupied concurrently. Where circulation spaces can also function as waiting or other activity areas, such as the lobby and main hallways in movie theaters and pre-function spaces in hotels and event centers, they shall be assumed to be occupied concurrently. Where lobbies will be occupied by the same people as the primary assembly space, as is common in performing arts facilities and places of worship, the assumption of concurrent occupancy may not be appropriate – where this is the case, note on the plan that such spaces are not occupied concurrently.

4. Egress

The CFC sets forth requirements for the fire protection and life safety of building occupants. The greatest concern and highest safety priority are building occupants. The CBC specifies requirements for the design of an exit, exit access, and exit discharge in all buildings. The CFC prescribes detailed regulations so individuals who are capable of rescuing themselves and other building occupants can safely and expeditiously leave a building in a fire or other emergency. The requirements found in CFC Chapter 10 are termed means of egress. The CFC has requirements for *means of egress* in two chapters. Chapter 10 in the CFC and CBC are the same and are applied to any new building or occupancy. The second set of requirements in CFC Chapter 11 is applied to existing buildings. The means of egress requirements in Chapter 11 are based on the occupancy classification and adopted building code at the time of the building's construction.

Introduction to Means of Egress

A building means of egress system has three distinctive and connected components

- Exit
- Exit access
- Exit discharge (CFC 202)

To evaluate the means of egress, the exits from a room, building, or portion of a building must be determined. Any egress path leading from an exit to the public way is an exit discharge. The exit is *that*

portion of a means of egress system between the exit access and the exit discharge or public way. An exit is either an exterior exit door at the level of discharge, an interior exit stairway and ramp, an exit passageway, an exterior exit stairway, and ramp or a horizontal exit. Even though many building features are commonly referred to as exits, those seven components are the only items actually referred to as an exit in the code. Exits cannot be used for any purpose that interferes with its function as a means of egress component. Once an exit is required to be constructed as a fire-resistive assembly or is equipped with automatic sprinkler protection, the required level of protection cannot be reduced until it terminates at the exit discharge. The minimum number of exits prescribed by the CBC is based on the occupant load per story and the travel distance to the closest exit. Depending on occupancy classification, only one exit may be required, given the building occupant load and the location of the occupancy in relation to the building's grade plane. (CFC 202, 1022)

Exit access is defined as *that portion of a means of egress system that leads from any occupied portion of a building or structure to an exit. The exit access is the area of the room or space where egress commences. For the most part, any walking surface inside a building is a component in the means of egress system. The space inside a hotel room, factory, shopping mall, or high-rise building is designated as either an exit access or exit. The CBC and CFC means of egress requirements ensure that any building equipment or fixtures do not impede, limit or obstruct one's ability to safely leave a building provided that the number of persons within a given space or area does not exceed the prescribed occupant load limits and travel distances to an exit. Exit access includes corridors that physically guide a person to an exit. The exit access must comply with the general provisions for all means of egress components, including ceiling height, protruding objects, continuity in walking surfaces. It also must comply with the doorway, travel distance, and corridor requirements for exits and exit access.*

A person has not completed egress from a building until they reach a public way, such as a street or alley. Exit discharge is defined as the portion of a means of egress system between the termination of an exit and a public way. In a multistory building, the level of exit discharge begins when the person reaches a grade level where the exit terminates, and an exit discharge commences. An exit discharge must be at grade or provide a means of access grade. It cannot reenter the building.

All three components together comprise the means of egress. For example, consider people exiting from the ninth story of a building. As they start out on their exit path, they are in the exit access. They would continue in the exit access until they reach an exit; in this case, it is an interior exit stairway. As they pass through the door into the interior exit stairway, they enter the exit. Traveling down the stairs, they are in the exit. Upon reaching the ground floor, they open the door to the outside. As they step through this door, they are now in the exit discharge. They remain in the exit discharge until they reach the public way.

Because of the size of a building or the site's topography, it may not be possible to have a direct and unobstructed path to a public way. In this case, the CBC requires an area outside of the building that can safely accommodate each occupant. A minimum area of 5 square feet is required for each person, and the area must be located at least 50 feet from the building. The area must be permanently maintained and identified as a safe dispersal area. (CFC 1028.5)

The following is a list of CBC and CFC means of egress that have minimum features and

characteristics that must be properly designed and maintained compliant:

1. Any given exit component requires a certain minimum width that is dictated by the occupant load and the IBC. (CFC 1005.1)
2. A building's function is limited to a certain number of occupants in a given area. The number of persons allowed in the given area is the occupant load. Because buildings can have numerous functions, different occupant load factors are prescribed for different functions. The total width of all exit access components must equal or exceed the occupant load. (CFC 1004.1)
3. The code limits the distance from any point in the building to an exit. In some cases, the exit access travel distances can be increased by providing fire-resistance-rated construction or by installing an automatic sprinkler system. In most buildings, two or more means of egress are required, and exit doors and exit access doors must be spatially remote from one another. (CFC 1017.1)
4. Exits, exit access, and the exit discharge are constructed on horizontal planes. Any change of elevation is accomplished using ramps, stairs, or steps. The code prescribes standard and consistent design criteria for these components to reduce and minimize tripping and fall hazards. (CFC1011.1, 1012.1)
5. The IBC requires the illumination and identification of exit access and the level of exit discharge components. When two or more exits are required, emergency power for exit identification and illumination is required. (CFC 1008.1, 1013.1)
6. To limit the potential for fire spread, the code prescribes more restrictive interior finish requirements to exit and exit access components when compared to the requirements for rooms or enclosed spaces. (CFC 803.3)
7. Generally, all means of egress require accessibility for mobility-impaired individuals. Depending on the building's occupancy classification and level of fire protection, one or more areas of refuge may be required to shelter individuals who need rescue assistance. A means of communication is commonly required in the area of rescue assistance. (CFC 1009.1)
8. A means of egress system that requires special knowledge or skills are not permitted. A code-compliant means of egress system simply requires persons to walk, operate simple door hardware, and follow one of the designated paths to the level of discharge. (CFC 1010.12, 1016.1, 1019.1)
9. Egress is complete when a person crosses the building property line and is in a public way.(CFC 202)
10. Unless used for accessible means of egress, people movers such as elevators, escalators, and moving sidewalks are prohibited from being components of a means of egress system. (CFC 1003.7)
11. The building code official is charged with approving the design and construction of new or renovated means of egress, including the occupant loads. The fire code official is responsible for ensuring the means of egress system is maintained.

5. Elevators

Elevators CBC 3002.4a – When elevators are provided in buildings with State Fire Marshal regulated occupancies, at least one elevator shall be designated as a medical emergency elevator and be able to accommodate a gurney measuring 2' x 7' with 5" radius corners. The preferred location

of the medical elevator is the elevator closest to the main point of entry, where firefighters would likely respond in an emergency. In structures where there are multiple elevators serving different sections of the building or where medical calls would be more frequent, such as in a large apartment building or care facility, multiple elevators may be required to be designated as medical elevators. If elevators are present, identify which is the medical elevator and provide a diagram on the plan demonstrating that a gurney can be maneuvered into and fits fully within the elevator cab with doors closed.

In two-story buildings, and in limited cases in three-story buildings where two more stories are at grade and each of those stories is served by a fire lane, the elevator may not need to be sized to accommodate a gurney provided that a gurney can be carried up the stairs. If this option will be used, provide a diagram demonstrating that the gurney can be maneuvered up the stairs in a horizontal position with the support of a minimum of four personnel. For two-story buildings, your stamped, approved architectural plan will be evidence to the State elevator inspector of RHFPD's concurrence with this design – a separate concurrence letter is not required and will not be provided. Where this exemption is granted on three-story buildings, written concurrence from the RHFPD is required and may be requested at the time of plan approval.

6. Phased Occupancy

If a portion of the structure will be occupied before construction is complete, it is incumbent upon the developer, architect, general contractor, and fire and life-safety systems subcontractors to collaborate early with RHFPD in the design process to develop a plan that will facilitate this consideration. A phased occupancy plan must be submitted to and reviewed by RHFPD as part of the architectural plan submittal. Requests for permission to phase occupancy WILL NOT normally be accepted after the start of construction.

At a minimum, considerations that require RHFPD approval on the phasing plan shall include, but are not limited to:

- 1) Clearly define and map areas which are proposed to be occupied from those still under construction by firewalls, buffer zones, and/or physical separation on plans or written proposal.
- 2) All occupied areas must show an approved physical separation from raw wood construction. Generally, this separation is an unoccupied area with fire protection and fully functional sprinklers to create a barrier from fire.
- 3) Fire alarm systems in occupied portions shall be zoned to ensure fully functioning systems that will not be interrupted or impacted by construction, installation, and testing in other phases.
- 4) Fire suppression systems and fire sprinkler systems, including fire pumps, fire hose valves, fire risers, and sprinkler branch lines, shall be fully functional before the first occupied phase of the project. These systems may not be disrupted/impacted by future

phases of the project.

- 5) An approved written plan to ensure that on-site fire district access roads and fire hydrants are not compromised during remaining phases of construction. This plan is generally approved during the review of the fire master plan and maintained on-site until construction completion.
- 6) Approved egress systems for all occupied portions of the building; egress shall be maintained at all times, and egress from occupied areas shall not pass into or through phases still under construction.
- 7) All occupancy requires RHFPD approval in State Fire Marshal regulated occupancies, which is collaborated but independent of phased occupancy permitted by the Building Department and all other authorities having jurisdiction over the project.

7. Fire Access Roadways

Fire access roadways, commonly referred to as fire lanes, shall 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. Extenuating circumstances increased hazards, and additional fire safety features may affect these requirements. CFC 503

A. Fire Apparatus Access Road Design - Fire access roadways must 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.

- 1) Support the imposed loads of RHFPD fire apparatus with a total weight of 75,000 pounds. Apparatus weight is distributed as 50,000 pounds on tandem rear axles and 25,000 pounds on the front axle. The surface shall be designed, constructed, and maintained to provide all-weather driving capabilities. A letter or statement, wet-stamped and signed by a registered engineer, shall be provided on the plans certifying that any new roadway meets this 75,000-pound test. A road base without an appropriate topping or binding material does not satisfy the all-weather requirement. CFC 503.2.3
- 2) Number of Fire Apparatus Access Roads Required:
 - a) One is required if any portion of an exterior wall of the first story of a building is located more than 150 feet from a fire access roadway. That access is to be measured by an approved route around the exterior of the building. See Attachment 3. CFC 503.1.1

EXCEPTION: When approved by the fire chief, this distance may be increased to 300 feet for open parking garages that comply with either (i) or (ii) below:

- (i) The structure is protected throughout with an NFPA 13 sprinkler system;
or
- (ii) The structure meets all of the following requirements:
 - (a) Two stairways are directly accessible via exterior doors/doorways.
 - (b) These stairways provide direct access to all tiers of the parking structure.
 - (c) These stairways are equipped with Class I wet standpipe outlets at each floor or intermediate landing.
 - (d) The doors/doorways serving these stairs are within 40' travel distance from a fire access roadway.
 - (e) These stairs are sufficiently separated and located in a manner that facilitates firefighting operations within the structure, as determined by the fire code official.

b) More than one road is required if it is determined that access by a single road may be insufficient due to terrain, location, travel distance, potential fire or life-safety hazards, or other factors that could limit access or if vehicle congestion, railways, or weather conditions could impair the single entry point. Supplementary access points shall be located to facilitate evacuation and emergency operations and minimize congestion or obstruction during an emergency incident. CFC 503.1.2

- (i) A minimum of two vehicle access points is required for any development containing 150 or more residential units.
- (ii) A secondary access point may also be required for commercial projects more than 124,000 sq. ft. in the building area. Requirements may vary depending on factors such as building use, expected vehicle, and occupant load on-site, traffic stacking, or impact on surrounding streets. When specified, RHFPD staff will coordinate with the local jurisdiction's community development and public works or engineering departments.

3) **Location of Fire Apparatus Access Roads:** For purposes of determining the suitability of public roads and fire access roadways for staging fire apparatus and facilitating fire suppression operations for a particular structure, the following criteria shall apply:

a) To protect fire apparatus, personnel, and equipment from damage and injury from falling debris, the edge of fire access roadways serving multi-story buildings should be located no closer than 10 to 30 feet from the building; the actual distance is a function of overall building height with consideration given to building construction, presence of openings, and other potential hazards. As distances greater than 40 feet inhibit the use of vehicle-mounted ladders. In comparison, distances closer than 20 feet do not allow for a proper laddering angle, the edge of fire lanes serving structures four or more stories in height shall be located between 20 and 40 feet from the building. These distances are measured from the face of the building to the top edge of the curb face or rolled curb flow line nearest the structure. To ensure that vehicular access and egress from dead-end fire access roadways serving multi-story buildings are maintained at all times, staging areas shall be provided along the roadway to permit

fire apparatus to pass ladder trucks that have outriggers extended. Consideration shall be given to the length of the roadway, roof and building design, obstructions to laddering, and other operational factors in determining the number, location, and configuration of such staging areas. CFC 503.1.1, 503.2.2

b) Access may be taken from an on-site fire apparatus access road or from a public road with an average daily trip (ADT) count below 30,000 unless a recorded access easement agreement is in effect to obtain access from adjacent properties. Contact the city or County Traffic Engineer's office or Public Works Department for Average Daily Traffic (ADT) information. CFC 503.1.1, 503.1.2

c) Public roads with an ADT count of 30,000 or more may be acceptable as a fire district access point serving an adjacent site when certain conditions and features (e.g., vehicle turnouts, acceleration/deceleration lanes) are present that limit the hazard to firefighters and other drivers. Such access roads will be evaluated on a case-by-case basis. CFC 503.1.1, 503.1.2

4) 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. CFC 503.2.1, 503.2.2, 503.4

a) In wildfire risk areas, fire lanes shall be at least 28 feet wide; Exception: fire lanes that are 150 feet or less in length maybe 24 feet wide if serving one to three dwelling units; where all structures served by the fire lane are protected with fire sprinklers, this length may be increased to 400 feet. This width shall be provided to a logical termination outside of the wildfire risk area. Refer to the Fire Hazard Severity Zone maps or contact the RHFPD Community Risk Reduction Department to determine whether your project is located within a wildfire risk area.

b) The width of fire district access roads is measured from the top face of the curb to the top face of the curb on streets with standard vertical curbs and gutters, and from the flow line to flow line on streets with rolled, sloped, flared, or other non-vertical curb and gutter configurations. The flow line is the lowest continuous elevation on a curb. Road sections and curb details or approved city street improvement plans may be required to verify the method of measurement.

5) Parking Restrictions - No parking is permitted on roadways that are narrower than 28 feet in width. Parking on one side is permitted on a roadway that is at least 28 feet but less than 36 feet in width. Parking on two sides is permitted on a roadway 36 feet or more in width. These restrictions apply to all roads serving as fire lanes, including those located in wildfire risk areas. See Attachment 29. Note: Minimum street widths for allowed parking may be more restrictive. Check with the local Planning Department for specific requirements. CFC 503.4

6) Vertical Clearance – Fire access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches. If trees are located adjacent to the fire access roadway, place a note on the plans stating that all vegetation overhanging the fire access roadway shall be maintained to provide a clear height of 13 feet 6 inches. See Attachments 20 and 20a. CFC

503.2.1

7) Fire Apparatus Access Road Grade - The grade for access roads shall not exceed 10% or 5.7 degrees. 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

8) Inside and Outside Turning Radii - The inside turning radius for an access road shall be 17 feet or greater. The outside turning radius for an access road shall be 38 feet or greater. As fire apparatus are unable to negotiate tight “S” curves, a 56-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 largest fire apparatus, an inside and outside turning radius of 20 and 42 feet, respectively, is recommended and requested. CFC 503.2.4. See Attachment 6.

9) Dead-end Access Roadways - Dead-end roadways in excess of 150 feet shall be designed and constructed with approved turnarounds or hammerheads. Turnarounds shall meet the turning radius requirements identified above. The minimum cul-de-sac radius is 38 feet, with no parking allowed. The maximum length of a cul-de-sac or other dead-end road without mid-way turn arounds or other mitigating features is 800 feet. See Attachment 30. CFC 503.2.5

10) Bridges - When a bridge is required as part of an access road, it shall be a minimum of 20’ in width and designed and constructed to accommodate a minimum total weight of 75,000 pounds. CFC 503.2.6

11) Median breaks - Where medians or raised islands are proposed that prevent emergency apparatus from crossing over into opposing traffic lanes, breaks or pass-through may be required. The location and design specifications for the pass-throughs shall be coordinated with the city/County public works or engineering department. CFC 503.1.2

12) Continuity of fire lanes – When any portion of a street, drive aisle, or other roadway is required to be a fire lane, and the roadway is longer than 150 feet, the remainder of the roadway shall be treated as a fire lane to a logical point of termination at another approved fire lane; at an approved hammerhead or turnaround; at an intersection with a public road suitable for use as a fire lane.

At the discretion of the fire code official, if the portion of the roadway that is required to be a fire lane is no more than 150 feet long, the fire lane may be terminated at that point provided that the remainder of the roadway beyond is clearly not suitable or intended for use as a fire lane. This may be due to factors including, but not limited to, insufficient width or vertical clearance, excessive grade, change in paving material/driveway apron, or other physical constraints or obvious visual indicators, as approved. CFC 503.1.1, 503.2.5

B. Aerial Fire Apparatus - Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet (9144 mm), approved aerial fire apparatus access roads shall

be provided. For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater CFC D105.1.

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 the building or portion thereof. CFC 105.2.

Proximity to the 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. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the fire code official. CFC 105.3

Obstructions. Overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the fire code official. CFC 105.4

C. Multiple-Family Residential Developments

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 CFC 106.1.

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.

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. CFC 106.2

D. Remoteness - Where two fire apparatus 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. CFC D1043

8. Roadway Identification CFC503.3

Fire lane identification will be required when it is necessary to restrict the 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). See Attachment 5.

A. Sign and Curb Marking Options - Areas designated as a fire lane require an acceptable method of marking that shall be approved prior to installation. Examples of dimensions and acceptable options for signage installations and markings are found in Attachments 7 through 15. The following methods are acceptable means of identifying designated fire lanes for public and private streets. Choose either option 1 OR option 2 below. Acceptable signage and/or marking requirements for streets in each jurisdiction must be verified with the appropriate City or County public works, community development, or traffic engineering department prior to submittal to the RHFPD. Where parking is otherwise restricted by city/county planning or traffic standards, and no parking zones are clearly identified with signs or curb markings in accordance with those standards, additional “FIRE LANE—NO PARKING” signs are not required, when approved by the Fire Code Official. (See the City of Hercules Planning Department.)

1) Specific areas designated by the RHFPD as fire lanes must be marked with red curbs meeting the specifications in Attachment 7. In addition, where the number of entrances into the area marked with fire lanes is limited, all such vehicle entrances to the designated area shall be posted with approved fire lane entrance signs meeting the specifications in Attachment 10. This option is preferred by the RHFPD.

2) “Fire Lane—No Parking” signs meeting the specifications in Attachment 12 shall be posted immediately adjacent to each designated fire lane and at intervals not to exceed 50 feet unless otherwise approved by the fire code official. In addition, where the number of entrances into the area marked with fire lanes is limited, all such vehicle entrances to the designated area shall be posted with approved fire lane entrance signs.

Note: All alternative signs must be approved through the RHFPD and by the city/county engineer and/or police agency, as applicable. In areas where fire lane parking restrictions are enforced by the California Highway Patrol, “NO STOPPING—FIRE LANE” signs meeting Caltrans standards shall be used.

9. Obstructions to Emergency Vehicle Access

Existing or proposed gates and barriers crossing fire apparatus access roadways must be shown on the plans. Information such as the location, type of gate (e.g., swinging, sliding), dimensions, and method of operation (manual, electric) must also be provided. Note or identify the following on the fire master plan:

A. Clear Width – Gated openings for egress and ingress of vehicles shall have at least 13 feet of clear width when serving a single 13-foot wide fire lane designed for traffic traveling in one direction and 20 feet clear for a 20-foot wide fire lane serving traffic traveling in two directions. The vertical clearance shall not be less than 13 feet 6 inches, including landscaping and/or trees. This reduction in width is applicable only to the area immediately adjacent to the guardhouse or gate. Roads leading up to and beyond the guardhouse or gate shall meet standard fire lane width requirements prescribed in Section 2.A.5 of this guideline. See Attachment 20. CFC 503.2.1

B. Turning Radii - The minimum inside turning radius is 17 feet with an outside radius of 38 feet for both the exterior and the anterior approach to the gate. To accommodate the RHFPD’s largest fire apparatus, 20 feet, and 42 feet or larger for inside and outside turning radii, respectively, is recommended and requested where possible.

C. Setbacks from the Street - Gates, and barriers shall be located a minimum of 46 feet (for existing developments) and 56 feet (for new developments) from any major street. A private driveway serving only one single-family residence is exempt from this requirement. If existing conditions prevent the installation of the minimum setback, documentation supporting an acceptable alternative shall be provided. The alternative solution must facilitate emergency ingress without endangering emergency response personnel, emergency apparatus, and the general public. The alternative shall be subject to review and approval. See Attachment 17. Note the required minimum setback from the street.

D. Setbacks from First Interior Turn - A 27-foot minimum unobstructed setback are required from a gate to the first turn to allow emergency apparatus clearance. See Attachment 17.

E. 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.

- a) Permanent or removable bollards are not permitted to be placed across fire access roadways. CFC 503.4
- b) For gates and barriers that are not used on a frequent basis or those that are located such that they have a reasonable likelihood of being blocked by vehicles, vegetation, furniture, or other obstructions (e.g., secondary fire district vehicle ingress/egress points, gates accessed from plazas or turf block areas), 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” or similar. See Attachment 16 for an example of a barrier sign. CFC 503.3
- c) Manually operated gates and barriers shall have frangible padlocks, Knox padlocks, or weather-resistant Knox key boxes. The key box shall be placed four to five feet above the

roadway surface at the right side of the access gate in a conspicuous location that is readily visible and accessible. The key box must be clearly labeled “FIRE DEPT.” CFC 506

- d) Where the gate will be used for purposes other than emergency vehicle access, the installation of a Knox box containing a key to operate an owner-supplied padlock is recommended. If the gate can be reached by emergency personnel from both sides (such as for a secondary emergency access roadway serving a residential tract), the lock shall also be capable of being accessed from both sides. Knox boxes shall be provided as necessary to ensure that the lock can be accessed and opened from any direction of approach available to emergency personnel. CFC 503.6, 506.1

F. Electrically Operated Gates and Barriers CFC 503.6

1) In the event of loss of normal power to the gate operating mechanism, it shall be automatically transferred to a fail-safe mode allowing the gate to be pushed open by a single firefighter without any other actions, knowledge, or manipulation of the operating mechanism being necessary and without the use of back-up battery power, except as noted below. The manufacturer’s specification sheet demonstrating compliance with this method of operation during power loss shall be provided or scanned directly onto the plan. Should the gate be too large or heavy for a single firefighter to open manually, a secondary source of reliable power by means of an emergency generator or a capacitor with enough reserve to automatically, immediately, and completely open the gate upon loss of primary power shall be provided for fail-open operation. A capacitor, but not a battery, may also be used for fail- open operation where the gate operating mechanism does not have a fail-safe mode.

- a) A battery may only be used in place of fail-safe manual operation when the gate operator has a fail-open mode that will automatically, immediately, and completely open the gate and keep it open upon reaching a low power threshold, regardless of the presence of normal power.

2) The gate control for electronic gates shall be operable by a Knox emergency override key switch (with dust cover). The key switch shall be placed between 42” and 48” above the roadway surface at the right side of the access gate within two feet of the edge of the roadway. The key switch shall be readily visible and unobstructed from the fire lane leading to the gate. The key switch shall be clearly labeled “FIRE DEPT.”

3) For electrically operated gates, the type of remote gate opening device that will be installed shall be noted on the plan. The remote opening device is required in addition to the Knox key switch. The remote opening systems currently available for use by RHFPD are either optical or radio-controlled. Optical systems work the same as the traffic signal preemption system by using the emergency vehicle’s strobe light to open the gate. The radio-controlled system opens the gate when the emergency responder clicks the receiver on an 800 MHz radio. A gate serving an individual single-family residence or duplex is exempt from this requirement.

Currently approved gate opening systems include:

- 3M Opticom (see attachment 18)
- Click2Enter* (system shall be configured in single-pulse mode with 1.5-second transmission window)

- Fire Strobe Access Products, Inc.
- Tomar

- 4) Upon activation of the key switch, the gate shall open and remain open until returned to normal operation by means of the key switch. Where a gate consists of two leaves, the key switch shall open both simultaneously if the operation of a single leaf on the ingress side does not provide for the width, turning radii, or setbacks necessary for fire apparatus to navigate the vehicle entry point.
- 5) The key switch shall be labeled with a permanent red sign with not less than 1/2” contrasting letters reading “FIRE DEPT” or with a “Knox” decal. Note this requirement on the plan.
- 6) Place the RHFPD notes for electric gates on the plan verbatim. See Attachment 18a.

G. Gate and Barrier Locks - Gate or barrier locks shall be reviewed and approved prior to their installation on any new and/or existing access gate or barrier. Authorization for Knox products is processed through the Knox Box company website at www.knoxbox.com. Knox key switches and key boxes serving only vehicle gates and not buildings shall be sub-mastered for use by both the fire and sheriff/police department. Call the RHFPD at 510-799-4561 for any questions regarding the need for key boxes or switches.

10. Premises Identification CBC501.2 , CFC 505.1

Three possible configurations of buildings or units within a building may exist and are identified as follows: freestanding buildings, multi-unit buildings, or multi-building clusters. Common to all configurations are the requirements listed in sections A through E below. Projects may also be subject to a specific address and wayfinding signage requirements contained in the local jurisdiction’s municipal ordinance or security code, which may be more restrictive than the requirements listed in this guideline.

A. Approved numbers or addresses shall be placed on the front elevation of all new or existing buildings in such a position that is plainly visible and legible from the street or road on which the property is addressed. Addresses shall not be located where they have the potential of being obstructed by signs, awnings, vegetation, or other building/site elements. An address monument at the vehicle entrance or other location clearly visible and legible from the public road may be provided in lieu of an address on the structure where only a single building with a single street address is present, and no other structures are accessible from the fire lane serving that structure.

B. The numbers shall contrast with their background.

C. The numbers shall be a minimum of 4 inches or more in height for single-family residential structures/duplexes, or individual unit numbers in multi-family residential structures and 6 inches or more for commercial structures or the primary building address or address range posted on multi-family residential structures. The 6-inch numbers shall have a one- inch stroke, and the 4-inch numbers shall have a 1/2-inch stroke, or as required by local ordinance, whichever is more

restrictive. Building setbacks, elevation, and landscaping can affect these minimum size requirements.

D. Address numbers are required to be internally or externally illuminated per RHFPD’s 2019 Code. Illumination of addresses is required to facilitate the rapid location of a site or building.

E. Where it is unclear as to which street a building is addressed to (e.g., a building is accessed only from a street other than the one it is addressed to; multiple main entrances to the site, or building itself, front different streets), the name of the street shall also be identified as part of the posted address.

In addition to common requirements specified above, the following additional requirements pertain to each building configuration described below:

F. Multi-Unit Buildings - Suite/apartment numbers shall be placed on or adjacent to the primary entrance for each suite/apartment and any other door providing access to fire district personnel during an emergency. Multiple residential and commercial units having entrance doors not visible from the street or road shall, in addition, have approved numbers grouped for all units within each structure and positioned to be plainly visible from the street or road.

G. Multi-Building Clusters - Approved numbers or addresses shall be placed on the front elevation(s) of all buildings that form the cluster. If all building addresses are not clearly visible or legible from the public road serving the structures and address monument shall also be provided at the entry point(s) to the site indicating the range of addresses accessible from that entrance.

11. Requirements for Residential Tract Developments

The following requirements apply to all new residential tract developments with single-family homes or duplexes. They may also be applied to individual single-family homes or duplexes or to multi-family housing projects as approved by the RHFPD official.

A. Cul-de-sacs

1) Any street that is a required fire lane and greater than 150 feet in length shall be provided with a 38-foot minimum outside turning radius or other approved turnaround within 150’ of the end of the fire lane. See Attachment 19. CFC 503.2.5

2) The cul-de-sac “bulb” (the portion at the dead-end of the cul-de-sac street which is wider than the cul-de-sac “neck” leading to it—see Attachment 19) shall be identified as a fire lane with red curbs or “Fire Lane—No Parking” signs (see Attachment 14). Fire lane markings may be omitted from the bulb if one or more of the following applies:

a) A three-point turn may be made within 150’ of the end of the cul-de-sac with all areas along the curb assumed to be occupied by parked vehicles. Auto-Turn software or other approved methods shall be used to demonstrate this unless a standard hammerhead turnaround template is used. See Attachment 14.

- b) The length of the cul-de-sac street, including any driveway or spur road accessed from the bulb that is a required fire lane, is not more than 150 feet (see Attachment 19). For cul-de-sac streets where all homes are protected with fire sprinklers, the cul-de-sac does not need to be a designated fire lane if the distance to the front door of the most remote home, as measured from entrance to the cul-de-sac street, is no more than 300 feet (see Attachment 23); or
 - c) The radius of the cul-de-sac is at least 46 feet; or
 - d) The cul-de-sac is a public street, and local traffic or planning restrictions prohibit the designation of fire lanes in the bulb:
 - (i) The homes accessed from the bulb of the cul-de-sac shall be protected with an automatic fire sprinkler system complying with NFPA 13-D. The sprinkler system shall include full protection of the attic space(s).
 - (ii) Written concurrence shall be provided from the appropriate city or County development official or engineer, indicating that such a prohibition on fire lane signs or red curbs is consistent with local zoning, development, and traffic codes.
- 3) Cul-de-sacs longer than 150 feet that are required to be designated as fire lanes may contain a center island provided that:
- a) A minimum 28-foot-wide drive lane with an adequate inside turning radius is provided around the island, and
 - b) Island and landscaping will not intrude into the drive lane,
 - c) Any home that uses the portion of the cul-de-sac beyond the beginning of the island to satisfy hose-pull requirements is protected with an automatic fire sprinkler system complying with NFPA 13 D; the sprinkler system shall include full protection of the attic space(s) or another approved method of mitigation
 - (i) Where the radius of the cul-de-sac and size of the island is such that access can be taken only from the portion of the drive lane beyond the beginning of the island (i.e., the road around the island is effectively a curved road and no longer presents the same obstruction to suppression activities as an island cul-de-sac would), attic protection need not be provided when approved by the fire code official.
 - d) The island's design at the no parking area with red curbs or fire lane signs. See Attachments 21 and 22.
- 4) Cul-de-sac streets that are not required fire lanes as determined by the fire code official are exempt from fire lane identification, turnaround, and other standard requirements; see Attachment 23. Cul-de-sacs, driveways, and other roadways located in the SRA shall comply with the regulations.

B. Residential eyebrow roads

If the “eyebrow” does not meet RHFPD’s turning radius and minimum width, fire district access will be measured around the island and any other obstructions from the nearest available fire lane. See

Attachment 31.

C. When a detached single-family home or duplex, or related accessory structure (pool house, casita, garage, workshop, barn, etc.) on a single-family residential lot, is protected throughout by an approved NFPA 13-D, 13-R, or 13 fire sprinkler system, access distance as measured along an approved route from the fire apparatus to the main entry door serving the interior of the structure may be up to 300 feet. Enhancements to the sprinkler system or project may be required when this distance exceeds 300 feet or when otherwise necessary to mitigate deficiencies in water supply, hydrant location, inaccessible portions of the building’s perimeter, location in a cul-de-sac with an island, etc.

D. Since local law enforcement resources are limited for parking enforcement purposes in private developments, the RHFPD requires a viable parking enforcement plan from the developer prior to approving the fire master plan. Parking enforcement plans shall include:

- 1) Detailed information specifically identifying who will be responsible for enforcing the plan, and
- 2) Powers granted to the entity shall include vehicle towing for parking violations include language similar to that provided in Attachment 5 of this guideline, and the level of enforcement to be carried out within the development.

This information must be integrated into the fire master plan. Evidence that the enforcement plan is permanently incorporated into the Conditions, Covenants, and Restrictions (CCRs) and/or recorded against the deed shall be provided prior to RHFPD approval of the final map or print of linen. Once approved, these provisions cannot be amended without written approval by the RHFPD. See Attachment 24 for a sample enforcement letter.

12. Engineered Alternative Fire Apparatus Access Systems

The following criteria will be used when evaluating an alternative engineered access surface material for a specific application (e.g., “Turf block,” “Grasscrete”). Prior to installation, the design professional must incorporate these criteria into a plan submittal subject to approval by RHFPD, which reserves the right to limit the amount or extent of alternative surface serving as required fire district access to a structure or site.

A. Calculations and a statement stamped and signed by a registered civil engineer or other qualified registered professional shall certify that the proposed surface and substrate meets the criteria of an all-weather driving surface and is capable of withstanding the minimum weight of 75,000 pounds imposed by RHFPD apparatus. Apparatus weight is distributed as 50,000 pounds on tandem rear axles and 25,000 pounds on the front axle. Note: the RHFPD recommends a minimum weight capability of 75,000 pounds in order to support our largest apparatus.

B. The manufacturer’s specification of the material being installed must indicate that the application is consistent with the manufacturer’s recommendations.

C. Material shall only be installed on slopes of no more than one degree (1.75% grade), unless otherwise specified by the manufacturer, and drainage shall be provided as required to provide adequate traction for RHFPD apparatus. Surfaces shall be crowned or sloped to one side to drain water away from the roadway; surfaces shall not have a “V” or other configuration causing water to accumulate in the fire access roadway. This information shall be detailed on the plan.

D. The design shall include a curb cut that delineates entry onto the engineered fire access surface from a street. A 4” or lower curb cut or a rolled/ramped curb is acceptable. The curb cut must be shown on the plan. The entry to the area shall be clearly marked as a fire lane with either a red curb or sign to prevent the entry from being blocked.

E. A minimum four-inch wide concrete strip around the perimeter of the designated area shall be specified on the plan to clearly delineate the extent of fire district access. If the area is accessible to or intended to be used by anyone other than emergency responders, the concrete curb shall be painted red and stenciled “Fire Lane—No Parking” in white every 30 feet or portion thereof. In areas where painting the curb is not feasible, alternative methods of delineating the extent of the fire access roadway, such as by stamping “Fire Lane—No Parking” into the concrete, posting of signs, or by the use of red reflectors, may be acceptable if approved by RHFPD plan review staff. Describe the method of identifying the extent of the fire access roadway clearly on the plan.

F. A clause requiring the maintenance of alternative access roadways shall be placed in the CCRs, deed, and/or similar documents.

G. Calculations and a statement stamped and signed by a registered civil engineer or other qualified registered professional shall certify that the proposed surface and substrate meets the

13. Hydrant and Water Availability Requirements

Applicants must provide documentation that hydrants are provided in the quantity and spacing described in CFC Appendix C. They must also show that they are capable of delivering the amount of water required by CFC Appendix B. 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, type of construction, and whether the building is equipped with fire sprinklers. This information must be shown clearly on the plans to assist in the determination of the fire flow requirement.

A. Water Availability – To facilitate the review process and avoid untimely delays in project approval, applicants are strongly encouraged to arrange a hydrant flow test with the local water department prior to submitting plans to the RHFPD if the project includes a new structure or increase in the floor area of an existing structure. The water availability information may not be required to be submitted for every project, and plans may be submitted with a hydrant flow test pending, but the applicant should understand that project approval may be delayed if it is determined during the review that this information is required. If the project requires an evaluation of the available fire flow, it will not be approved without a completed Water Availability form or equivalent datasheets from a water district. Water availability information must be no older than twelve months.

- 1) Determine the required fire flow from CFC Table B105.1 and B105.2, as applicable, provided in Attachment 32. A 50% reduction in fire flow (but not duration) may be taken when the fire-flow calculation 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 electronically send the form to the RHFPD Community Risk Reduction Department, and we will determine the fire flow for you.
- 2) Contact East Bay Municipal Water Direct at 1 (510) 287-1008 (EBMUD) 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 allow or require a qualified third party to perform the flow test for you.
- 3) In newly developed areas without water infrastructure, the water department may issue a "will-serve" letter indicating the expected amount of water that will be delivered once the water system is installed and operational.
 - a) If multiple hydrants are located within the maximum distance allowed by CFC Table C102.1, the amount of water available from each hydrant may be combined, provided that the hydrants have flowed simultaneously.
 - b) It is the applicant's responsibility to ensure that the following information is provided on EBMUD's test data sheet.
 - c) Static pressure and residual pressure in psi and observed flow in gallons per minute g.p.m.; or
 - d) Calculated flow in g.p.m. at 20 psi.

NOTE: Please ensure that the fire area, building size, construction type, and flow data are complete and accurate. Errors or omissions in this information may result in plans having to be resubmitted or fire flow testing being redone.

B. Fire-Flow Calculation Area – The fire-flow calculation area shall be the total floor area of all floor levels within the exterior walls, and under the horizontal projections of the roof of a building, except as modified in the following two conditions: 1) Portions of buildings which are separated by firewalls without openings, constructed in accordance with the California Building Code are allowed to be considered as separate fire- flow calculation areas; 2) The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors. CFC Appendix B Section B104

C. Hydrant Location – Hydrants shall be provided along the length of the fire access roadway in the quantities and up to the maximum distances prescribed in CFC Table C102.1. See Attachments 25 and 27.

- 1) Hydrants must be located within three feet of the edge of a fire access 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. Where hydrants are

located in landscaped areas, a 4x4' concrete pad is required by the RHFPD to ensure that vegetation does not encroach on this clear space.

- 2) The hydrant outlets must face the fire access roadway. Where all of the outlets cannot face the fire access roadway (e.g., the hydrant is located in a landscape peninsula or island in a parking lot; the hydrant has three outlets), the 4.5" outlet(s) shall take precedence.
- 3) 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, additional hydrants may be provided or the hydrant 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.
- 4) Hydrants shall be located so that a hose line running between the hydrant and the fire department connection(s) (FDCs) served by that hydrant does not cross driveways, obstruct roads or fire lanes, or otherwise interfere with emergency vehicle response and evacuation of a site, and be within 100 feet from the FDC.
- 5) Hydrants and fire department connections shall not be located behind parking stalls or in other locations where they are likely to be blocked by vehicles or other objects. Whenever possible, hydrants shall be placed at the street and drive aisle intersections in preference to mid-block locations. Where on-street parking is allowed, hydrants should be placed in the shortest parkways between adjacent driveways, at corners and chokers where parking is not normally allowed, and in similar areas where impact to space available for parking and the potential for hydrants to be obstructed is minimized. Where adherence to the spacing requirements of CFC Table C102.1 does not permit hydrant locations to be optimized in this manner, the fire code official may authorize alternative spacing.
- 6) Hydrants and fire department connections should not be located where apparatus staged at these appurtenances would then encroach on minimum fire apparatus turning radii unless alternative routes are available. Hydrants shall not be placed in the "bulb" end of a cul-de-sac where apparatus staged at the hydrant would prevent the cul-de-sac from being used as a turnaround.

D. Protection of Hydrants – Where hydrants are located such that they are exposed to potential damage from vehicular collision, they shall be protected by curbs or bollards. See Attachment 28.

- 1) If vehicles can approach the hydrant from more than one direction, the hydrant shall be protected by four bollards of concrete-filled pipe four inches in diameter and mounted in concrete in a square around the hydrant. The bollards need to be spaced a minimum of three 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.
- 2) 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 a standard concrete curb at least six inches in height.

E. Hydrant Markers and Color

- 1) Blue reflective pavement markers (“blue dots”) shall be used to identify fire hydrant locations. Blue reflective markers used for any other purpose should be removed.
 - a) Two-way streets and roads – Markers shall be placed six inches from the edge of the painted centerline or from the approximate center of streets without a painted centerline on the side nearest the hydrant.
 - b) Streets with left-turn lanes at the intersection – Markers shall be placed six inches from the edge of the painted white line on the side nearest the hydrant.
 - c) Streets with continuous two-way left-turn lane – Markers shall be placed six inches from the edge of the painted yellow line on the side nearest the fire hydrant.
 - d) Freeways – Because of higher maintenance at these locations, markers shall be placed on the shoulder of the roadway one foot to the right of the painted edge line nearest the hydrant.
- 2) Hydrant Color
 - a) Private hydrants (hydrants separated from the city main by and located downstream from a backflow prevention device) shall be painted OSHA safety red or equivalent. A plan for underground piping serving private hydrants shall be submitted to the RHFPD for review and approval.
 - b) Public hydrants shall be painted any color other than red as specified by the local water purveyor or RHFPD.

14. Access to Structures

A. Hose pull – The dimension of 150 feet when used in relation to fire district 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, the weight of equipment, hydraulic properties, and accepted operational procedures. See Attachment 3.

- 1) 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 should not be measured “as the crow flies.”
- 2) 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.

- 3) Hose pull measurements begin at a point in the street located 10 feet from the edge of the curb.

B. Access walkways - CFC 504.1 provides for the installation of approved access walkways from fire access roadways to exterior openings required by either the CBC or CFC. The RHFPD may require the construction of such walkways depending upon particular site conditions or project parameters. These conditions include, but are not limited to, building use or occupancy, topography, vegetation, and surface conditions. Design professionals must carefully consider these issues when developing a project site. When required:

- 1) Access walkways must be provided to all required egress doors from a building, all firefighter access doorways in buildings with high-piled storage, and the area beneath each rescue window, at a minimum. Access walkways will typically be required around the entire perimeter of a structure to facilitate control of a fire through any other available openings.
- 2) Access walkways must be a minimum of five feet in width.
- 3) Access walkways shall consist of a surface that lends itself to safe use during a building evacuation, firefighting, and rescue efforts. Solid surface walkways such as concrete or asphalt are preferable, though alternative surfaces such as decomposed granite (DG), gravel, or grass are permissible under certain conditions. Ground covers and shrubs that prevent or impede laddering of structures are not permitted to be planted on or adjacent to access walkways.
- 4) Where the grade itself presents a slip or fall hazard, an access walkway with a slip-resistant surface and/or stairway must be provided.
- 5) The type of material provided for the access walkway and/or other specifications shall be indicated on the fire master plan and are subject to approval during the plan review by the RHFPD.

C. Path of travel obstructions - Firefighter access to and emergency egress from required openings must remain free and unobstructed at all times. Architects, landscape designers, and facility managers must take care to ensure that fences, planters, and vegetation will not interfere with access and egress routes.

- 1) Fences - Walls, fences, hedges, and similar obstructions may not be located within the area designated as an access walkway unless a gate through the obstruction equipped with an approved padlock or Knox box has been provided for firefighters to access the perimeter of the structure. If the wall or fence blocks travel from required egress openings to the public way or an open area at least 50 feet from the structure (“safe dispersal area” per CBC 1028.5), a gate operable by the occupants evacuating the structure must be provided that allows unimpeded egress to the public way. Where doors in the path of emergency egress travel are required to be equipped with panic hardware, gates shall likewise be similarly equipped. These requirements may not apply to individual single-family residences.

2) Vegetation - As stated previously, certain types of ground cover and low-growing plants present an impediment to firefighting and rescue operations and are prohibited from being planted in the access walkway. In addition, taller vegetation such as shrubs and trees may not be located where they will present an obstruction to accessing rescue windows either when planted or upon maturation. Raised planter areas are not allowed to be used as rescue ladder access points where the change in elevation could be a potential impediment to firefighter access.

3) Key boxes and key switches - Knox devices shall be provided where necessary to ensure that immediate access for firefighting, rescue, and other emergency purposes is possible. See Attachment 18.

a) Location - At a minimum, Knox devices shall be provided for the following locations:

- (i) gates along the paths of firefighter travel from the fire lane to all points along the perimeter of the structure;
- (ii) gates to pool enclosures;
- (iii) building gates or doors leading to interior courtyards containing rescue windows;
- (iv) building gates or doors leading to exterior hallways or balconies providing access to residential units or tenant suites;
- (v) gates in exterior enclosures containing hazardous or combustible material storage;
- (vi) buildings using hazardous materials or processes where such warrants immediate access
- (vii) exterior doors to rooms containing main alarm panels or annunciators;
- (viii) doors and gates providing access to parking structures;
- (ix) within the fire command center in high-rises and other large buildings;
- (x) the main entry to buildings equipped throughout with an alarm system and not staffed 24/7;
- (xi) facilities where a high-volume of after-hours calls is expected or experienced;
- (xii) doors and gates to other areas identified by the fire district.

The Knox key box shall be provided with key sets in accordance with the following chart:

<u>Building Size</u>	<u>Key Sets</u>
1-2 stories, <10,000 sq. ft.	2
1-2 stories, >10,000 sq. ft.	5
2+ stories	One set per floor, minimum of 5 sets

4) When approved by the RHFPD Fire Official, a frangible padlock or chain that can be cut with bolt cutters or a Knox padlock may be used in lieu of a key box for exterior hazardous or combustible materials storage areas. Manually operated vehicle or pedestrian access gates that are not commonly used or not required to be openable from the egress side may also be provided with a frangible padlock or chain.

5) Knox boxes or switches shall be located adjacent to and clearly visible from the gate or door served. For gates in walls and fences up to six feet in height, they shall be securely mounted at a height of four to five feet above grade; on buildings, they shall be mounted six feet above grade, in

a location that is easily accessible to firefighters and, when required, police officers. Where the potential for vandalism or tampering is significant, key boxes that are not sub-mastered for police department use may be mounted higher, up to ten feet. See CFC Sec 506. Boxes and switches are not required to be electronically monitored; if they are, they shall not initiate an alarm signal that requires a response by the fire district.

- a) Key box Contents - The key used to unlock the gate or door shall be kept in the key box. When the key unlocks more than the individual adjacent gate or door, a label or tag shall be attached to the key identifying the gates or doors it operates. Where multiple gates or doors are served by a single box, two or more copies of the key(s) are recommended so that a copy will be available to each engine company responding to the site.
- b) Electric Locks – Electromagnetically or electromechanically locked pedestrian gates and doors shall be equipped either with a Knox box containing a key to open the lock or, if the door lock cannot be operated with a key from the exterior, a Knox key switch shall be provided adjacent to the door. Where key switches are provided, the door or gate lock shall remain disengaged until the key switch is returned to the “normal” closed or locked position.
- c) Master and Sub master Keying - Knox devices that provide access only to the perimeter of buildings and common exterior areas shall be sub-mastered for dual-use by the fire and police departments. Where access to common interior areas of buildings is mandated by the local security or municipal code, Knox devices shall also be sub-mastered. Knox boxes containing keys to access any interior private spaces, such as the interior of single-tenant buildings or individual suites in a multi-tenant building, shall be mastered for use by the fire district only. Where the local code requires police department access to these private interior portions of the building, a Knox box with dual master cylinders (one usable by the police, the other by the fire district), a separate device for each agency, or other arrangements may be required—contact RHFPD if this condition applies to your project. Where additional devices beyond those required by the fire district are called for in the local municipal or security code, they shall also be accessible for use by the fire district to facilitate emergency response.
- d) Ordering Knox Devices - Knox products are ordered through the Knox Box Company website at www.knoxbox.com. If you have questions, please contact RHFPD at 510 799-4561.
- 6) Rescue windows - In R occupancy structures requiring rescue openings, trees, shrubs, cabanas, trellises, fences, walls, pools, and other features shall not impede laddering operations. A clear space for raising and setting a ladder shall be provided beneath each rescue opening, and a walkable path free of obstructions shall be provided between each laddering area and the firefighter tunnel. See Attachment 4a.

15. Access During Construction

Access and water supply during construction shall comply with CFC Chapter 33 and the provisions listed in this section and, where applicable, elsewhere in this guideline. Construction activities at job sites not complying with these requirements may be suspended at the discretion of the RHFPD inspector until a reasonable level of compliance is achieved.

At no time shall construction projects impair or obstruct existing fire access roadways or access to and operation of existing fire hydrants serving other structures. Should existing roadways or hydrants need to be moved or otherwise altered during the course of construction, the developer shall provide alternative access routes and other mitigation features to ensure adequate fire and life-safety protection. Such alternatives and features shall be submitted to the RHFPD Prevention Department for review and approval prior to the alteration of existing conditions.

A. Lumber drop inspection – an inspection shall be scheduled with an RHFPD inspector to verify that access roadways and operable hydrants have been provided for buildings under construction.

- 1) For buildings of Type IV and V construction (and non-combustible structures that may have a portion of the exterior walls, façade, or other building elements comprised of wood or other combustible material), a lumber drop inspection shall occur prior to bringing combustible building materials on site.
- 2) For other construction types (Type I, II, III) with exterior walls built of non-combustible materials, an inspection shall occur prior to commencing interior construction involving combustible materials (e.g., wooden mezzanines or partition walls, carpet, cabinetry or other woodwork, furniture, etc.). In concrete tilt-up and masonry buildings, wooden panelized roofing systems are exempt from this requirement.
- 3) An inspection shall occur prior to construction, reaching 40 feet in height for buildings of any construction type that will have four or more floors when complete.
- 4) The street address of the site shall be prominently posted at each entrance. For projects on streets that do not have a name or street signs posted yet, the sign shall include the project name and tract/lot number.
- 5) Gates, through construction fencing, shall be equipped with a Knox padlock or frangible lock/chain. The local jurisdiction may also have specific construction site security requirements that may be more stringent. Where more stringent local requirements apply, provisions shall be made to ensure that firefighters can open the gate with bolt-cutters.
- 6) When required by the RHFPD inspector, fire lanes shall be posted with “Fire Lane—No Parking” signs or no parking areas shall be otherwise identified to maintain them free of obstructions during construction.
- 7) Provisions shall be made to ensure that hydrants are not blocked by vehicles or obstructed by construction material or debris. A three-foot clear space shall be provided around the perimeter of all hydrants, and no parking or similar obstructions shall be allowed along the adjacent road within 15 feet of the hydrant. Inoperable hydrants shall be bagged and clearly marked “Out of Service.”

B. Temporary Fire Access Roads - Temporary access roads (construction roads that do not match the final location and configuration of permanent roads as approved on a Fire Master Plan) and temporary hydrants may be permitted for single-family residential model construction or a single detached custom home less than 5500 square feet in area with the conditions listed below. They may be allowed on a case-by-case basis for other structures with additional requirements, as determined by an RHFPD fire code official.

- 1) Plans for temporary access shall be submitted to the RHFPD Department. Plans shall be drawn to scale and show permanent (existing) roadways, proposed temporary roadway locations, location of models, space dedicated to the storage of construction materials, and parking for work crews and temporary access and hydrants.
- 2) Plans shall be stamped and signed by a licensed civil engineer stating that the temporary access road can support 75,000 pounds of vehicle weight in all-weather conditions. The road base material shall be over soil compacted to at least 90% and be mixed or topped with a suitable bonding material to provide all-weather characteristics; road base alone does not satisfy this requirement. Provide manufacturer's documentation that demonstrates the suitability of the material specifically as a road stabilizer as opposed to a dust palliative or for hillside erosion control, and, if applicable, indicating the mixture ratio for this purpose.
- 3) Provide a parking plan for the construction site detailing how the fire lane no parking regulations will be enforced. Include a clause in the letter stating that "the job-site superintendent is responsible for informing the work crews of parking requirements and that the entire job-site is subject to shut down by the RHFPD inspector if parking is in violation of fire lane posting." The letter shall be written on company letterhead and scanned onto the plan.
- 4) Above-ground invasion lines are acceptable for water supply.
 - a) Provide drawings detailing how the line will be secured in place (e.g., size, depth, and interval of rebar tie-downs) and protected from vehicular damage (e.g., K-rails or bollards).
 - b) An invasion line may be run underground if the depth of bury can support the 75,000- pound weight of a fire apparatus.
 - c) The temporary water line must provide the required fire flow; calculations may be required.
 - d) The pipe shall be listed for fire service.
 - e) Temporary fire hydrants shall consist of a minimum 6" barrel with one 2-1/2" outlet and a 4 1/2" outlet. Note this on the plan.
- 5) All other access and water requirements shall apply (e.g., width, approach clearance, premises identification, locks, gates, barriers, etc.).
- 6) The approved plan for temporary access and water supply shall be available at the construction site prior to bringing combustible building materials on-site.
- 7) An inspection by the RHFPD Fire Inspector is required to verify adherence to the approved plan prior to bringing combustible materials on-site.

C. Phased access - Incremental installation of permanent access roadways, as shown on a fire master plan, maybe permissible for commercial and residential developments. If a phased installation is anticipated, the site superintendent or designee shall review the installation process with an RHFPD inspector during the lumber drop inspection or pre-construction meeting. Depending on the complexity of the installation, size of the project, and other project-specific factors, the inspector may allow phased installation to proceed immediately or may first require that all or some of the following items are satisfied:

- 1) Plans for phased access shall be submitted to the RHFPD either as part of the original fire master plan submittal or as a revision to an approved fire master plan. Plans shall be drawn to scale and demonstrate that all access and water requirements are met during all phases of construction, and that approval of one phase does not compromise or complicate the completion of the subsequent phases. Plans shall show for each phase of construction:
 - a) the extent of building construction
 - b) the location of operable hydrants serving all buildings under construction
 - c) the location of construction fencing, barriers, and vehicle access gates
 - d) the location of all temporary or permanent “Fire Lane—No Parking” signs
 - e) equipment/materiel staging locations
 - f) worker parking areas (see item “4” below)
- 2) Phasing plans shall be stamped and signed by a licensed civil engineer stating that the access road can support 75,000 pounds of vehicle weight in all-weather conditions apparatus. The road base material shall be over soil compacted to at least 90% and be mixed or topped with a suitable bonding material to provide all-weather characteristics; road base alone does not satisfy this requirement. The final road section less the final lift of asphalt topping may be acceptable if certified by the engineer.
- 3) The phasing plan shall identify any anticipated areas where fire district access roadways may be temporarily inaccessible due to trenching, slurry coating, striping, or other construction activities after they have been installed and inspected. The plan shall indicate the anticipated period of impairment and include provisions for providing plating over trenches and alternative access routes, notification to the fire district, and/or other forms of mitigation when such roadways are impaired.
- 4) Provide a parking plan for the construction site detailing how the fire lane no parking regulations will be enforced. Include a clause stating that “the job-site superintendent is responsible for informing the work crews of parking requirements and that the entire job-site is subject to shut down by the RHFPD inspector if parking is in violation of fire lane posting.”
- 5) The approved phasing plan shall be available at the construction site prior to bringing combustible building materials on-site. A lumber drop inspection by an RHFPD inspector will be required prior to the commencement of each phase; additional inspection fees will be due for each phase.
- 6) All other access and water requirements shall apply (e.g., width, approach clearance, premises identification, locks, gates, barriers, etc.).

16. Rescue Openings CBC 1030

A. Rescue openings shall be provided for all sleeping rooms located in basements and on the first three stories above grade unless the building meets the exceptions in CBC 1030.1, such as for R-1 and R-2 occupancies in Type I, IIA, IIIA, or IV buildings protected with an NFPA 13 sprinkler system. Identify each rescue window on the floor plan and elevation and specify the dimensions required and provided on the window schedule. Laddering Rescue Windows– An approved access walkway shall be provided that enables firefighters to easily and safely reach a clear, flat space beneath each rescue opening. This “laddering pad” shall be no less than three feet wide and three feet long. Obstructions such as shrubs, trees, trellises, carports, raised planters, walls, fences, pools, steeply sloped roofs, overhangs, and similar building and site elements shall not impede the use of or access to the walkway, pad, or rescue opening. Walkways and laddering pads may consist of hardscape, decomposed granite, grass, or any other material that does not inhibit the use of the area for laddering operations. Shrubs and certain types of woody groundcover or vines that present a trip hazard or create an unstable laddering surface (e.g., ivy, rosemary, ice plant) are not permitted to be installed on access walkways or laddering pads; other groundcovers on walkways and pads shall be maintained at a low height that facilitates foot traffic and firefighting and rescue operations, generally four to ten inches depending on plant type and density or other characteristics that may impact their suitability this use. Trees that encroach on walkways shall provide a minimum seven foot clearance underneath to allow unhindered passage by firefighters, however, trees and shrubs shall not encroach on laddering pads or adjacent areas needed to raise the ladder to the rescue opening.

B. The distance between the nearest edge of laddering pad and the structure is based on standardized operational procedures and safe practice to achieve a proper laddering angle – too steep an angle and the ladder is difficult to climb and may fall away from the structure; too shallow and the ladder will bounce and may bend or break under use. The proper laddering angle is calculated using the following formula:

$$d = (h/5)+2$$

Where h = the height of the window sill or balcony railing d = the distance in feet from the edge of the pad nearest the building to a point on the ground directly beneath the rescue window sill or balcony edge.

Refer to **Attachment 4** for a graphic representation of this formula and a table of approximate distances for given window sill or balcony railing heights.

C. Provide a plan demonstrating that vegetation at its fully-grown size and building and site features will not obstruct the access walkways, laddering pads, or area between the pads and rescue openings. It is incumbent upon the developer, architect, landscape architect, and facility maintenance personnel to collaborate and carefully consider a site and building design and plant palette that complies with these requirements not only at time of building completion but throughout the life of the building.

17. Emergency Responder Radio Coverage

- A. All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems. **CFC 510.1 Emergency responder radio coverage in new buildings.**

- B. A separate set of radio coverage drawings in compliance with the 2019 edition of NFPA 1221, including Section 9.6 (Two-Way Radio Communication Enhancement Systems) with technical requirements for design, installation, and performance, shall be submitted to the RHFPD plan check department with appropriate fee.

- C. All systems shall be installed in accordance with Chapter 5 of the California Fire Code, Emergency Responder Radio Coverage in New Buildings and NPFA Standard 1221 Standard for the Installation, Maintenance, and use of Emergency Services Communications System.

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FIRE AUTHORITY NOTES

All of the notes listed in the INSPECTION REQUIREMENTS and GENERAL REQUIREMENTS sections shall be placed, verbatim, on the plan under the heading “FIRE AUTHORITY NOTES.” Include individual notes, as applicable, from the PROJECT-SPECIFIC REQUIREMENTS section.

INSPECTION REQUIREMENTS

1. RHFPD site inspections are required for this project. Please schedule all field inspections at least 48 hours in advance. Inspections canceled after 1 p.m. on the day before the scheduled date will be subject to a re-inspection fee. Call RHFPD Inspection Scheduling at 510 799-4561
2. A lumber drop inspection shall be performed prior to bringing combustible materials (or combustible fixtures and finishes for structures of non-combustible construction). All-weather access roads capable of supporting 75,000 lbs., topped with asphalt, concrete, or equivalent shall be in place and hydrants operational at time of lumber drop inspection.
3. For projects with fuel modification, a vegetation clearance inspection is required prior to a lumber drop inspection.
4. Phased installation of fire access roads requires additional inspections not covered by the fees paid at plan submittal. Contact Inspection Scheduling to arrange for additional inspections that may be needed and any fees that may be due.
5. An original approved, signed, wet-stamped RHFPD fire master plan shall be available on-site at time of inspection.
6. Access roads and hydrants shall be maintained and remain clear of obstructions at all times during and after construction. Areas where parking is not permitted shall be clearly identified at all times. Obstruction of fire lanes and hydrants may result in cancellation or suspension of inspections.
7. Temporary fuel tanks of 60 or more gallons shall be reviewed, inspected, and permitted by the RHFPD prior to use.
8. The project address shall be clearly posted and visible from the public road during construction.
9. All gates in construction fencing shall be equipped with either a Knox or breakaway padlock.
10. Buildings of four or more stories shall be provided with stairs and a standpipe before reaching 40 feet in height.

GENERAL REQUIREMENTS

11. Fire lane widths shall be measured from top face of the curb to top face of the curb for fire lanes with standard curbs and gutters and from flow-line to flow-line for fire lanes with modified curb designs (e.g., rolled, ramped, etc.). The developer is responsible to verify that all approved public works or grading department street improvement plans or precise grading plans conform to the minimum street width measurements per the approved RHFPD fire master plan and standards identified in RHFPD Guideline B-09 for all portions of the fire access roads.
12. Permanent, temporary, and phased emergency access roads shall be designed and maintained to support an imposed load of 75,000 lbs. and surfaced to provide all-weather driving capabilities.
13. Fire lane signs and red curbs shall meet the specifications shown in the RHFPD Fire Master Plans and shall be installed as described therein. Additional fire lane markings may be required at the time of inspection depending on field conditions.
14. All fire hydrants shall have a “Blue Reflective Pavement Marker” indicating their location per the RHFPD standard. On private property markers are to be maintained in good condition by the property owner.
15. Address numbers shall be located and be of a color and size so as to be plainly visible and legible

from the roadway from which the building is addressed in accordance with RHFPD Fire Master Plans. Wayfinding signs, when required by the local AHJ, shall comply with the standards of that agency. When wayfinding signs are also required by the RHFPD, they may be designed to local AHJ requirements provided that such standards facilitate location of structures, suites, and dwelling units by emergency personnel.

16. Access gates shall be approved prior to installation and shall be in compliance with Chapter 5 of the CFC and RHFPD guidelines.
17. Approved access walkways shall be provided to all required openings and all rescue windows.
18. Vegetation shall be selected and maintained in such a manner as to allow immediate access to all hydrants, valves, fire district connections, pull stations, extinguishers, sprinkler risers, alarm control panels, rescue windows, and other devices or areas used for firefighting purposes. Vegetation or building features shall not obstruct address numbers or inhibit the functioning of alarm bells, horns, or strobes.
19. Dumpsters and trash containers larger than 1.5 cubic yards shall not be stored in buildings or placed within 5 feet of combustible walls, openings or combustible roof eave lines unless protected by an approved sprinkler system.
20. Any future modification to the approved Fire Master Plan or approved site plan, including but not limited to road width, grade, speed humps, turning radii, gates or other obstructions, shall require review, inspection, and approval by the RHFPD.
21. Approval of this plan shall not be construed as approval of any information or project conditions other than those items and requirements identified in RHFPD Fire Master Plans and related portions of the 2016 CFC and CBC. This project may be subject to additional requirements not stated herein upon examination of actual site and project conditions or disclosure of additional information.

PROJECT-SPECIFIC REQUIREMENTS

(Include only those notes that are applicable to the project as designed; some notes may need to be modified to address specific project conditions)

22. An underground piping plan is required for the installation of an automatic fire sprinkler system or for a private fire hydrant system. A separate plan submittal is required.
23. An architectural plan is required to be submitted to the RHFPD for review and approval for projects containing A, C, E, F, H, I, L, and R-4 occupancies. A plan may also be required for R-1 and R-2 occupancies over two stories or those utilizing sprinklers or fire walls to increase the maximum building size allowed.
24. A chemical classification and hazardous materials compliance plan shall be approved by the RHFPD prior to any hazardous materials being stored or used on site. A separate plan submittal is required.
25. Buildings used for high-piled storage shall comply with CFC requirements. A separate plan submittal is required if materials will be stored higher than 12 feet for lower-hazard commodities, or higher than six feet for high-hazard commodities such as plastics, rubber, flammable/combustible liquids, tires, carpet, etc.
26. An automatic fire sprinkler system shall be installed in accordance with applicable codes and local ordinances, amendments, and guidelines. Sprinkler systems, other than those listed in CFC 903.4, shall be monitored by an approved central station. Separate plan submittals for the sprinkler and monitoring systems are required.
27. Buildings containing industrial refrigeration systems shall comply with CFC requirements. A separate plan submittal is required if refrigerant quantities exceed thresholds.

28. A fire alarm system shall be installed in accordance with applicable codes and local ordinances, amendments, and guidelines. A separate plan submittal is required.
29. Structures located in a Fire Hazard Severity Zone or Wildland-Urban Interface area are subject to the construction requirements prescribed in Chapter 7A of the current CBC and/or Section 337 of the current CFC. Construction materials/methods are reviewed and inspected by Contra Costa County or the City of Hercules respective Building Departments.
30. One or more structures shown on this plan are located adjacent to a fuel modification area. Changes to the fuel modification zone landscaping, new structures, or addition/alteration to existing structures requires review and approval by the RHFPD.
31. Projects located in State Responsibility Areas shall also comply with all applicable requirements from Title 14, Div. 1.5, Ch. 7, Sub. Ch. 2 "SRA Fire Safe Regulations".
32. Structures meeting the criteria in CFC 510.1 shall be provided with an emergency responder radio system. Refer to CFC 510.2 through 510.6.3 and DAS/BDA guidelines published in the master document.

ATTACHMENT 1

Plan Submittal Content Checklist

The following information, if applicable, shall be provided on or with the architectural plan.

PROJECT INFO

- A detailed description of the scope of the project
- Project name, street address, and tract/tentative tract/parcel map (not assessor's parcel) number
- The current code editions and relevant standards that apply to this project (e.g., 2016 CFC, 2016 CBC)
- A list of submittals to the RHFPD that will be deferred (e.g., sprinklers, alarms, hood and duct extinguishing system, sprinkler monitoring system, etc.)
- If the project is a new building or addition, a photocopy of the stamped approved fire master plan
- Standard RHFPD architectural notes, customized where appropriate for the proposed use or occupancy. See Attachment 2
- If the project incorporates an alternate method or material (AM&M), a copy of the AM&M documentation is scanned onto the plan
- For plans submitted directly to the RHFPD and not through the building department: structural, mechanical, and plumbing plans have been removed from the set if not specifically requested to be included by the RHFPD reviewer

BUILDING INFO

- The total area and height of the building, including garages, breezeways and similar spaces
- Size of the project, if it is a tenant improvement
- The number of stories in the building
- The occupancy type(s) for the project
- The area of each occupancy classification on each floor
- The construction type of the building
- An allowable area calculation in the format specified by CBC Equations 5-1 through 5-5. Clearly indicate which provisions of CBC Chapter 5 have been used to increase the size of the structure or number of stories
- Fire walls, frontage, and assumed property lines used to justify allowable area shown
- Wall area to opening ratio shown for exterior walls required to be rated due to proximity to property lines
- If the property is adjacent to a fuel modification zone, non-combustible construction setback is identified
- If project is located in FHSZ, note indicating "Construction to conform to CBC Chapter 7A or an approved fire protection plan" is included

FIRE SPRINKLER/ALARM SYSTEMS

- Indicate whether the building and/or tenant space is currently fully or partially fire sprinklered; if the building/tenant space is not currently sprinklered, indicate whether sprinklers will be installed as part of this project, what type of system will be installed (NFPA 13 or 13-R), and what portion of the building/tenant space the system will protect if it is not the whole building
- State whether the building is fully or partially equipped with an alarm system and if so, what type (detection, evacuation/notification, sprinkler monitoring, etc.) and where. If not, indicate whether an alarm will be installed as part of this project. Specify the type of system to be installed and what portion of the building/tenant space it will protect if it is not the whole building

USE/OCCUPANCY

- Occupancy classification and use indicated for each space, including adjacent tenant spaces
- Occupancy separations and rated construction shown on plan. If the "non-separated" approach will be used, specify this on the plan and show the extent of the building or tenant space it will apply to
- Include the area, occupant load factor, and total number of occupants for each space. For projects with complex egress systems or over 100 occupants, or for projects involving an "I" occupancy, provide this information as part of an egress analysis diagram. The egress analysis shows the number of occupants in each space, travel distance, the cumulative number of occupants passing through each portion of the means of egress system (doorways, corridors, stairs, etc.), and the required vs. provided width of each means of egress component.

- A letter of intended use, if not readily apparent from the room titles (e.g., a more specific name such as “Library” or “Conference Room” as compared to a generic use such as “Multi-purpose Room” or “Activity Room”) and for daycare occupancies (include quantity, age range, and grade-level of occupants for each space)
- A seating diagram showing the location of all tables and/or chairs in each anticipated configuration for A occupancies
- Call out accessory uses and demonstrate with a calculation that they do not exceed 10% of area of the floor they’re located on or, if in a multi-tenant building, 10% of the area of the primary use they support
- Call out incidental use spaces. If sprinklers are being used in lieu of rated separation, note that incidental use spaces shall be separated from adjacent spaces by construction capable of resisting the passage of smoke

EGRESS

- Identify all doors equipped with panic hardware with a “PH” on the floor plan and/or in the door schedule
- Identify doors equipped with electronic locks (e.g., card readers, delayed egress devices, electromagnetic locks, or access control devices).
- Doors serving spaces with an occupant load of 50 or more or H occupancies swing in the direction of egress travel
- Indicate the maximum travel distance to the nearest exit on the plan

- Fire-resistive construction (shafts, corridor walls, egress enclosures, door/window assemblies) identified and rating called out on plan
- The location of all visual (i.e., illuminated) exit signs and, when required, the location of low level exit signs
- The location, wording, and specifications for all tactile exit signs. Include a diagram demonstrating that the proposed signs meet the applicable requirements of CBC 1013.4 and Chapter 11A or 11B
- The location, wording, and specification for all stair identification signs for stairwells serving four or more floors.
- The location of all emergency lighting fixtures. A photometric analysis may be required when it does not appear that sufficient emergency lights have been provided
- The slope of ramps and aisles or other changes in elevation along the egress path
- The rise and run measurements of all stairways
- The location, sill height, and opening dimensions of all rescue windows and railing heights of all balconies serving rescue openings in R occupancies
- The location and wording of occupant load signs in all A occupancies and classrooms that do not consist solely of fixed seating
- The minimum aisle access way spacing between rows of seats in auditorium-style seating or the clear space between each set of tables and chairs in dining areas. The clear space is measured in accordance with CBC 1029.9 and 1029.12

MISCELLANEOUS

- A diagram demonstrating that elevators serving more than two floors comply with the gurney/stretchers requirements of CBC 3002
- Elevator lobbies are provided when required, or the feature(s) allowing omission of a lobby are identified on the plan

ATTACHMENT 2

Fire Master Plan Submittal Checklist

PROJECT INFORMATION

- Scope of project is clearly defined on the plan? Yes
- Conditional Use Permit conditions included with submittal? Yes N/A (CUP was not required by city/county)
- Tract/Tentative Tract/Parcel Map Number has been provided? Yes
- Standard RHFPD fire master plan notes are included? Yes (Notes are tailored to this project, where applicable)
- Building area, construction, occupancy, sprinkler type noted on plan? Yes
- Allowable area calculation provided on plan? Yes No (<6,000 sf unsprinklered; <18,000 with sprinklers)
- Sheets not relevant to fire master plan removed from plan set? Yes
- Access/hydrant phasing plan provided? Yes N/A (No phasing of access/hydrant installation)

WATER AND HYDRANTS

- Water availability form completed and provided? Yes No (Test in process) No (no change in demand)
- All hydrants within 350' of the site are shown on plan? Yes
- Are hydrants provided/spaced per CFC Appendix C? Yes

ACCESS AND ROADWAYS

- Extent of the access roadway is clearly shown on the plan? Yes
- Turning radii and width (incl. road sections) shown on the plan? Yes
- Exterior of all structures within 150' hose pull distance? Yes No (AM&M proposed) No (sprinklered R-3)
- Engineer's certification provided for new paving? Yes N/A (No new paving)
- Walkable surface provided to required openings? Yes
- Road and walkway grades >10% shown on plan? Yes N/A (Grade <10%)

FIRE LANE IDENTIFICATION

- Red curbs are identified on plan with bold, dashed, or red lines? Yes N/A ("Fire Lane—No Parking" signs provided)
- Location of each "Fire Lane—No Parking" sign shown? Yes N/A (Red curbs provided)
- Fire lane entrance sign provided at each vehicle entrance? Yes N/A (All roads at least 36 feet wide)
- Drawings of red curbs/"No Parking"/entrance signs provided? Yes N/A (All roads at least 36 feet wide)

GATES AND OBSTRUCTIONS

- Are all gates, fences, and planters shown? Yes
- Are vehicle gates identified as manual or electric? Yes N/A (No gates proposed)
- Gate operator specs showing emergency operation provided? Yes N/A (No electric gates proposed)
- Manual vehicle gates have "No Parking" sign noted? Yes N/A (No manual gates proposed)
- Knox boxes/locks/switches are noted on plans? Yes N/A (No gates proposed)
- RHFD gate notes/specifications included on plan? Yes N/A (No gates proposed)

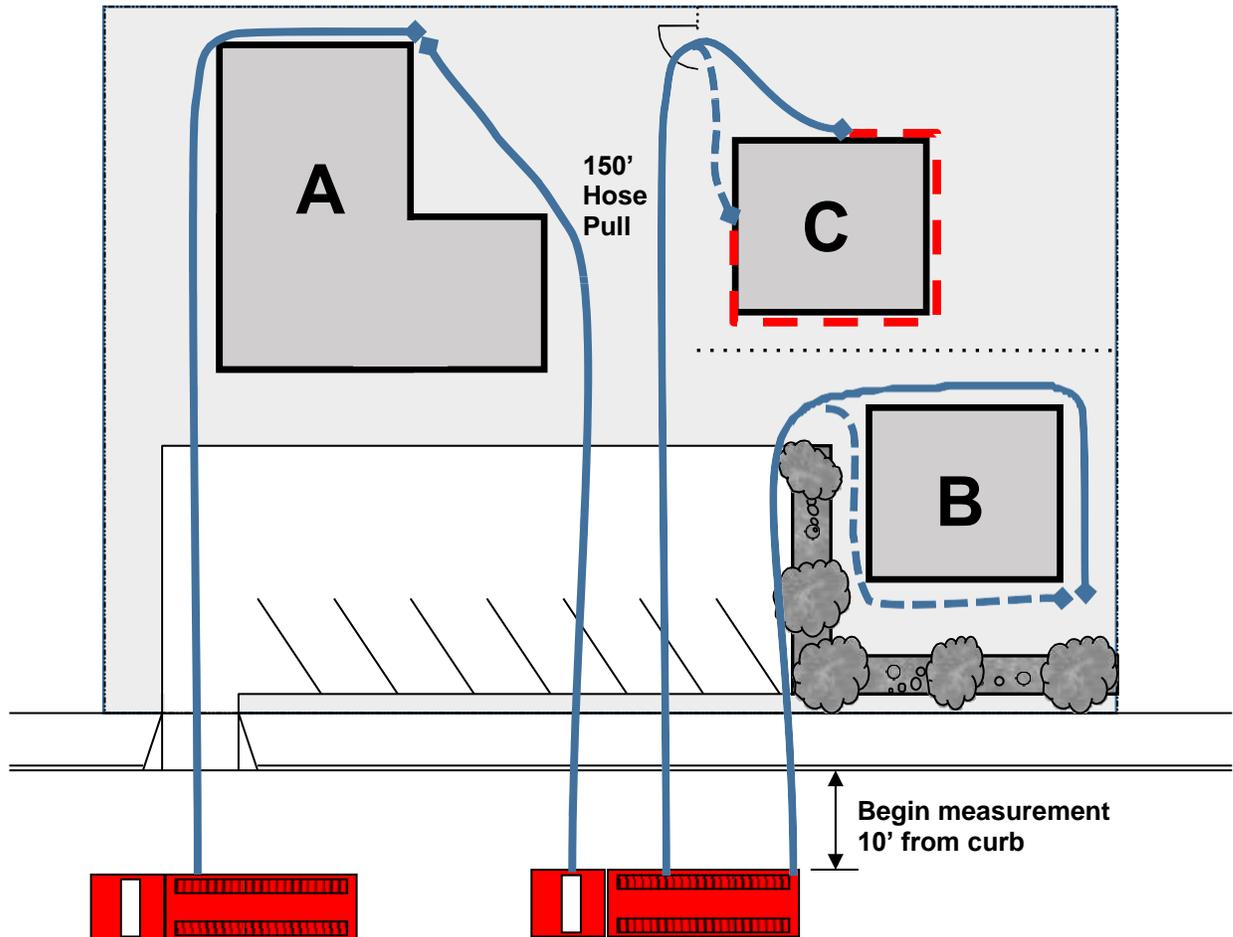
OTHER REQUIREMENTS

- Alternate Methods & Materials letter scanned onto plan? Yes N/A (No alternate methods proposed)
- Premises ID/address monument location shown on plan? Yes N/A (Single family homes)
- Trash enclosures are located at least 5' from buildings? Yes No (Enclosures are existing or sprinklered)
- Two entry points provided for 150 or more residences? Yes N/A (Non-residential project)
- Buildings >75' to highest occupiable floor called out? Yes N/A (No high-rise structures)
- Parking enforcement letter provided? Yes N/A (Public streets only)

NOTE: This is only a listing of basic fire master plan submittal requirements. Other information or requirements may be necessary depending on conditions specific to each project.

ATTACHMENT 3

Hose Pull

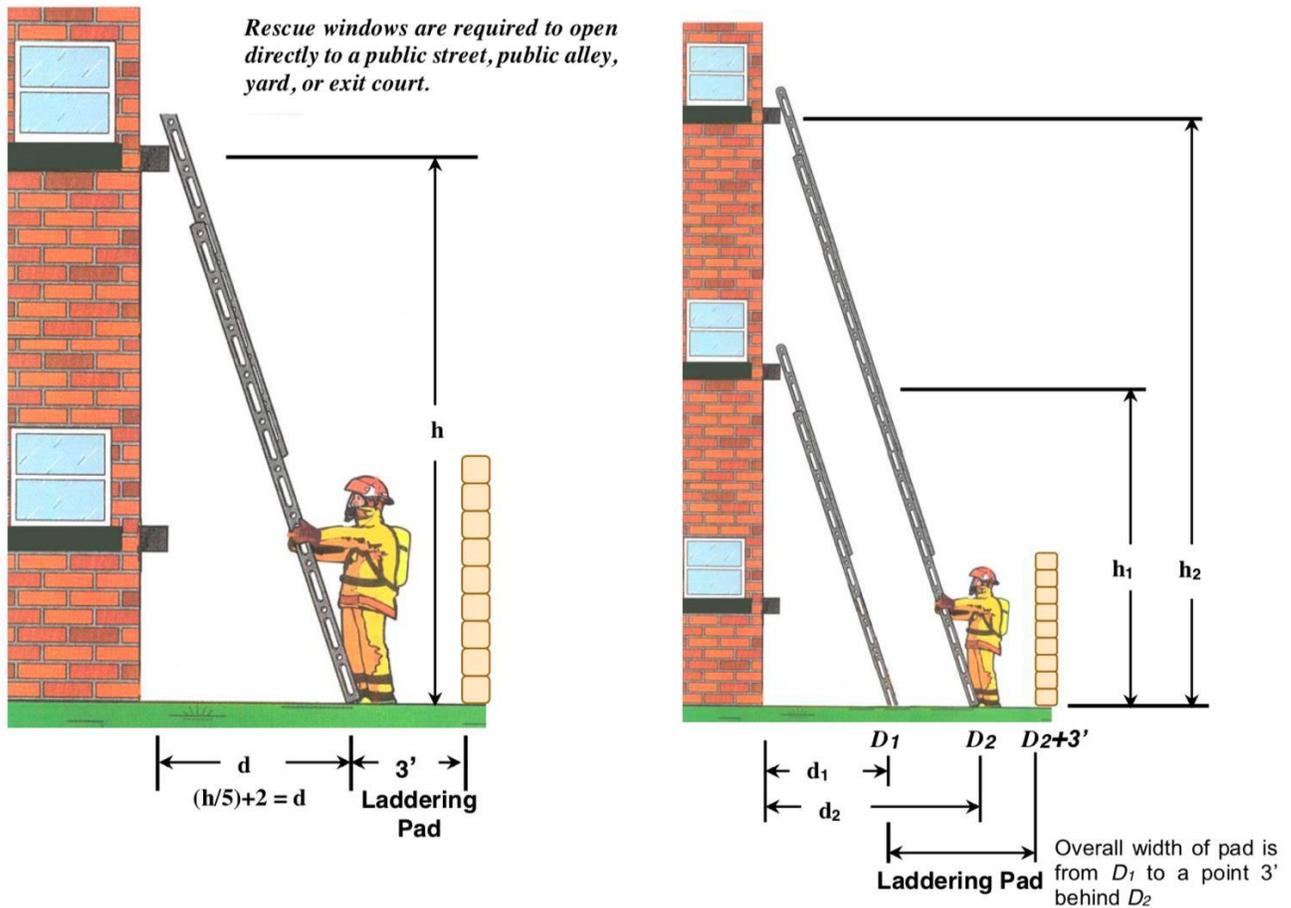


In the example above, assume that the parking lot is not accessible to fire apparatus due to turning radii and fire lane widths less than the required minimums.

- All portions of building “A” are within 150’ feet of the public road as measured along the path of firefighter travel. This building is in access.
- Building “B” is also in access despite the obstruction presented by the planter and hedges due to its proximity to the road.
- 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 to the dashed part of the perimeter beyond 150’. On-site fire access roadways or a change in the location of the gate would be necessary to provide access to Building “C”.

ATTACHMENT 4

Ladder Pad Setbacks for Rescue Openings



Sill Height (h)	Distance (d)
35'	9'-0"
34'	8'-10"
33'	8'-7"
32'	8'-5"
31'	8'-2"
30'	8'-0"
29'	7'-10"
28'	7'-7"
27'	7'-5"
26'	7'-2"

Placement of Ladders

Sill Height (h)	Distance (d)
25'	7'-0"
24'	6'-10"
23'	6'-7"
22'	6'-5"
21'	6'-2"
20'	6'-0"
19'	5'-10"
18'	5'-7"
17'	5'-5"
16'	5'-2"

Sill Height (h)	Distance (d)
15'	5'-0"
14'	4' to 5'
13'	4' to 5'
12'	3' to 5'
11'	3' to 4'
10'	2' to 4'
9'	2' to 4'
8'	2' to 3'
7'	1' to 3'
<7'	1' to 2'

ATTACHMENT 4a

Minimum Requirements for Rescue Openings



1031.7 Emergency escape and rescue openings. Required emergency escape and rescue openings shall be maintained in accordance with the code in effect at the time of construction, and the following: Required emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools. Bars, grilles, grates or similar devices are allowed to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with the code that was in effect at the time of construction and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.

ATTACHMENT 5

Fire Lane Parking Violations

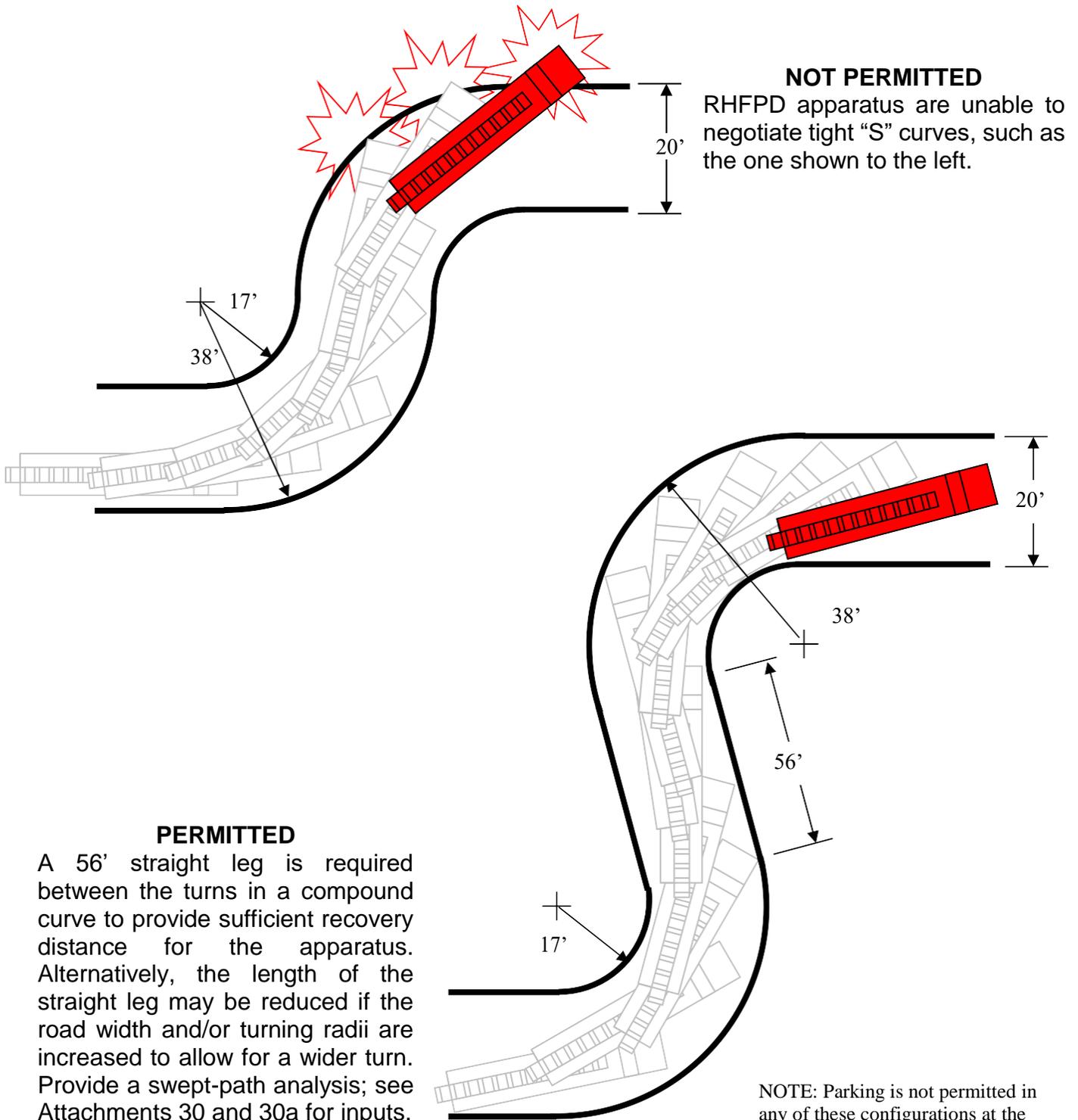
The California Fire Code (CFC) and California Vehicle Code (CVC) specify rules of the road for stopping, standing, and parking in fire lanes or near fire hydrants.

- A. Section 22500.1 states that no person shall stop, park, or leave standing any vehicle whether attended or unattended, in any location designated as a fire lane by the Fire Authority except when necessary to avoid conflict with other traffic or in compliance with the direction of a peace officer or official traffic control device. Vehicles illegally parked in a fire lane may be towed per CVC 22953(b).
- B. There shall be no parking of any vehicles other than fire department vehicles within 15 feet of either side of a fire hydrant in accordance with CVC 22514(c). Such vehicles may be towed per CVC 22651(e).
- C. CFC 503.4 states that the required width of a fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances shall be maintained at all times.
- D. CFC 507.5.4 states that vehicles and other obstructions shall not be placed or kept near fire hydrants, fire department inlet connections or fire-protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately discernible. The fire department shall not be deterred or hindered from gaining immediate access to fire-protection equipment or hydrants.

NOTE: Codes listed were adopted by resolution following a public hearing by the Rodeo-Hercules Board of Directors and thereby fully enforceable.

ATTACHMENT 6

"S" Curves

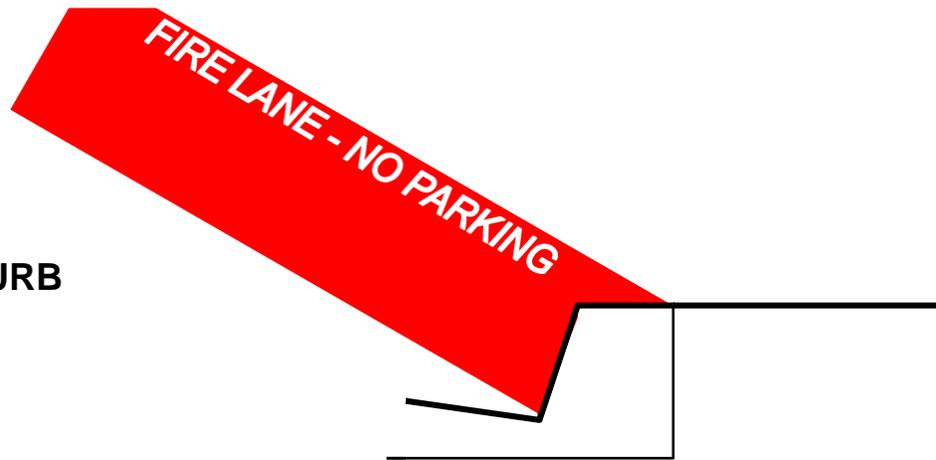


Drawings not to scale; for illustration purposes only.

ATTACHMENT 7

Fire Lane Identification – Red Curbs

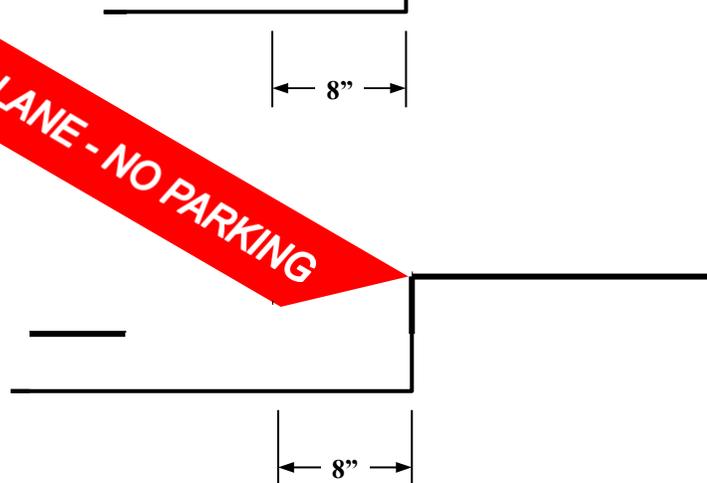
STANDARD CURB



ROLLED CURB



NO CURB/
FLARED CURB

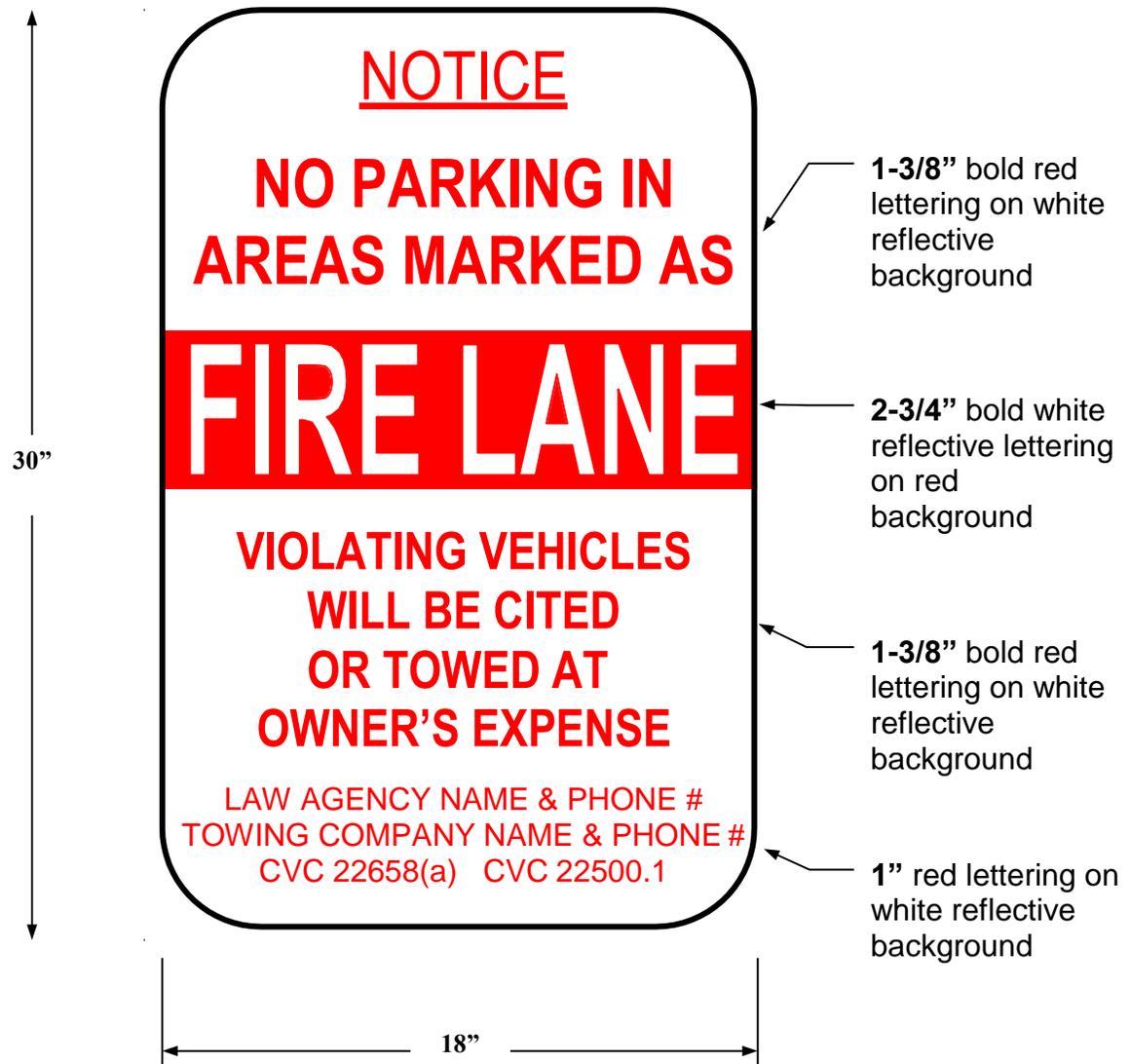


1. Fire lane entrance sign(s) shall also be provided per Attachment 8 or 9.
2. Curbs shall be painted OSHA safety red.
3. "FIRE LANE – NO PARKING" shall be painted on top of curb in 3" white lettering at a spacing of 30' on center or portion thereof.

ATTACHMENT 8

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 curbs



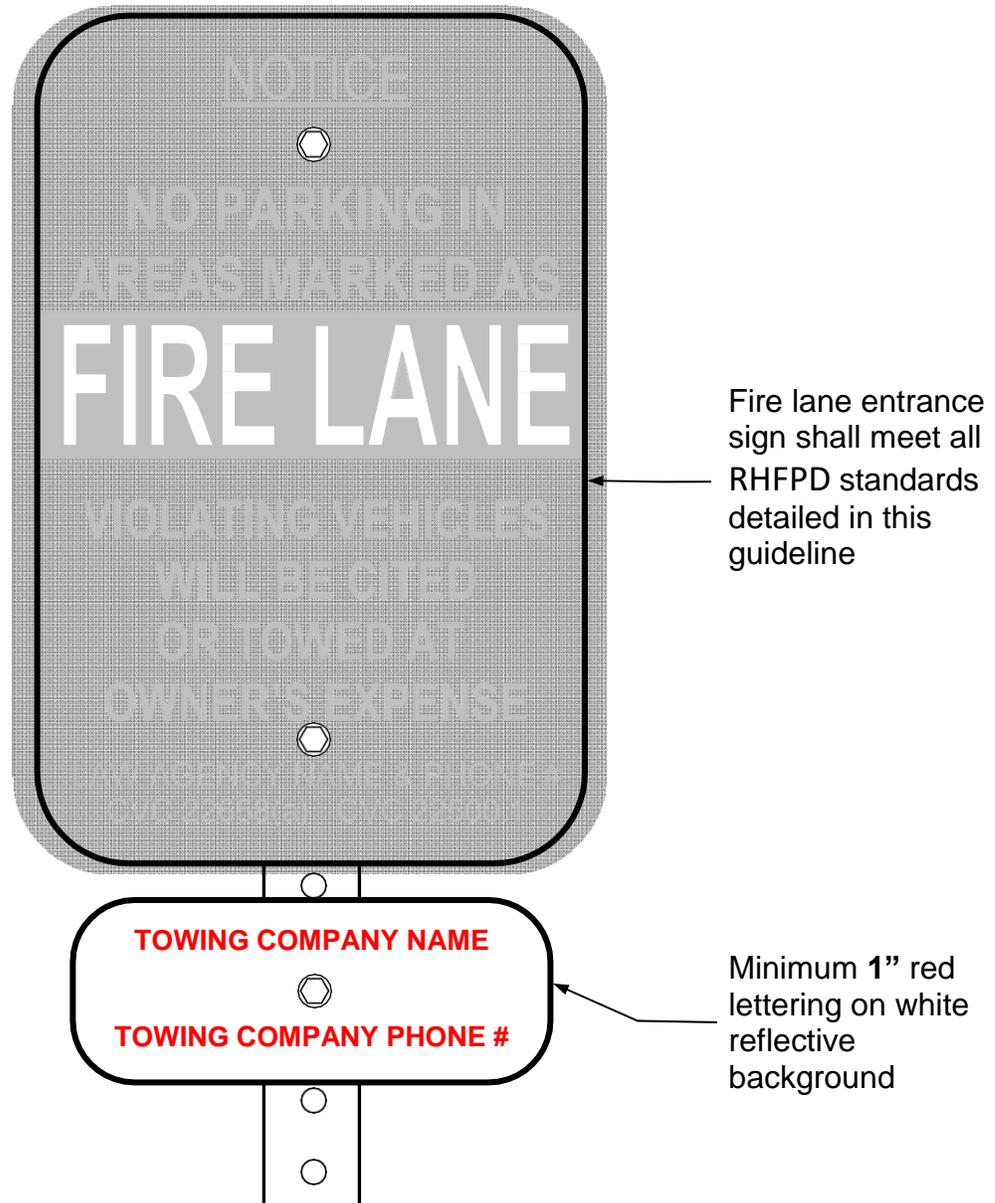
All sign and lettering dimensions shown are minimums. “Arial Narrow” font is used in sample above though other legible sans-serif fonts may be acceptable.

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 13 and 15.

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 9

Specifications for Alternate Location of Towing Company Information



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.

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 10

Specifications for Fire Lane No Parking Signs



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

In areas where fire lane parking restrictions are enforced by the California Highway Patrol, "NO STOPPING—FIRE LANE" signs meeting Caltrans standards shall be used.

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 15.

ATTACHMENT 11

Specifications for Cul-de-Sac Fire Lane No Parking Signs



All sign and lettering dimensions shown are *minimums*. "Arial Narrow" font is 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 15.

ATTACHMENT 12

Specifications for Alternative Fire Lane No Parking Signs



Additional verbiage shall be **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".

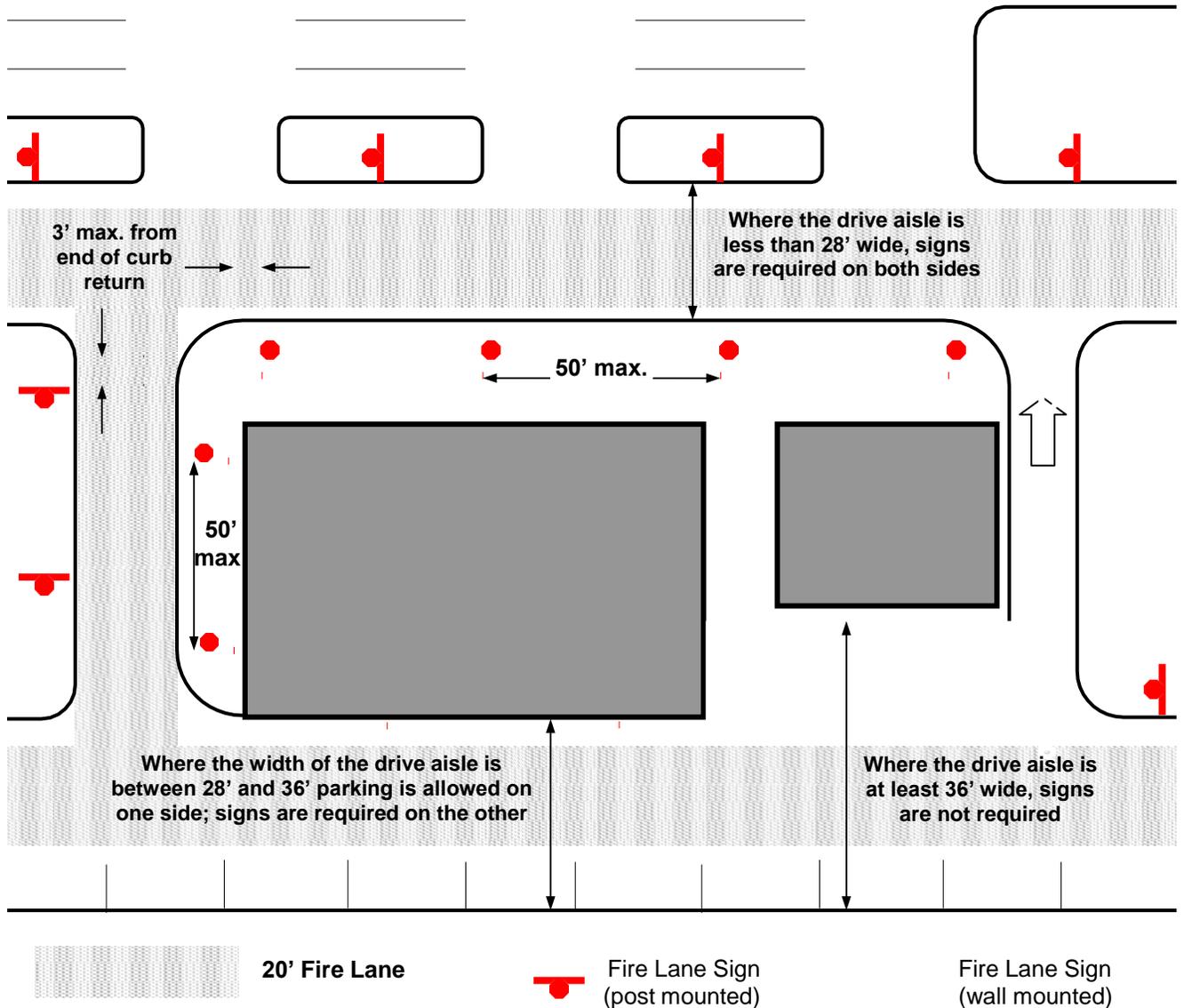
Specifications for the rest of the sign shall match those of standard fire lane no parking signs.

All sign and lettering dimensions shown are *minimums*. "Arial Narrow" font used is 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 15.

ATTACHMENT 13

Fire Lane No Parking Sign Locations

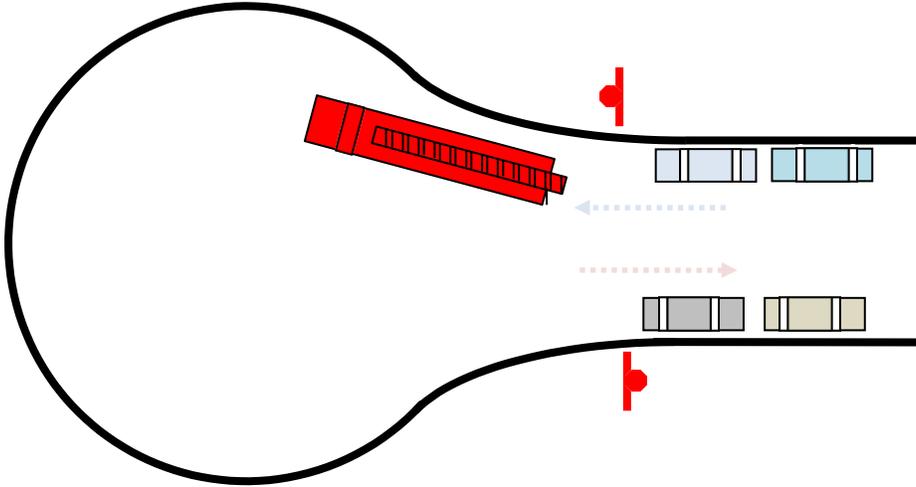


Signs are required within 3' of the end of the curb return at the beginning of each "block" along the fire lane and spaced a maximum of 50' along the entire designated lane. A sign shall be located within a reasonable distance of the end of each block as necessary to clearly identify the extent of the no parking zone. One sign is required for each island adjacent to the fire lane that is large enough to accommodate a parked car.

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 Attachment 15. Where sign posts are not practical, signs may be mounted on a wall or fence and are allowed to be oriented perpendicular to the length of the fire lane. RHFPD inspectors will determine if additional signs or sign locations are required.

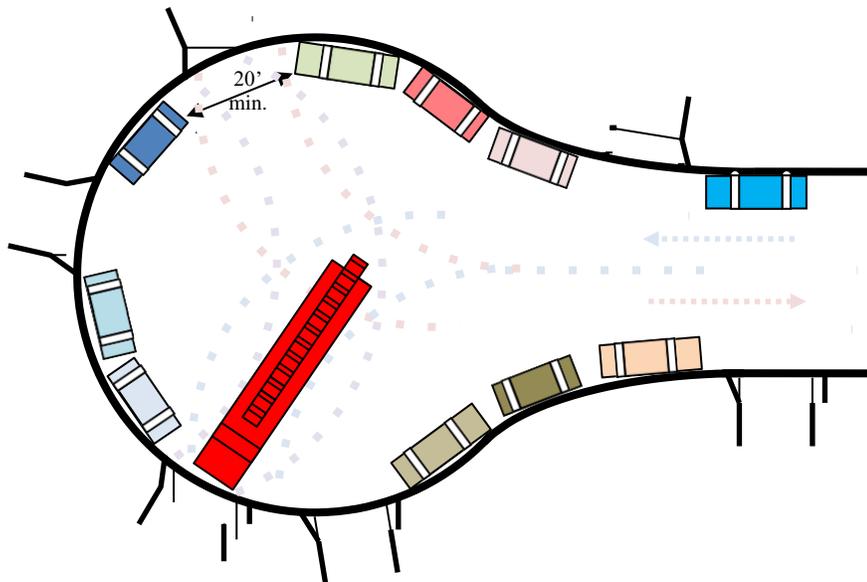
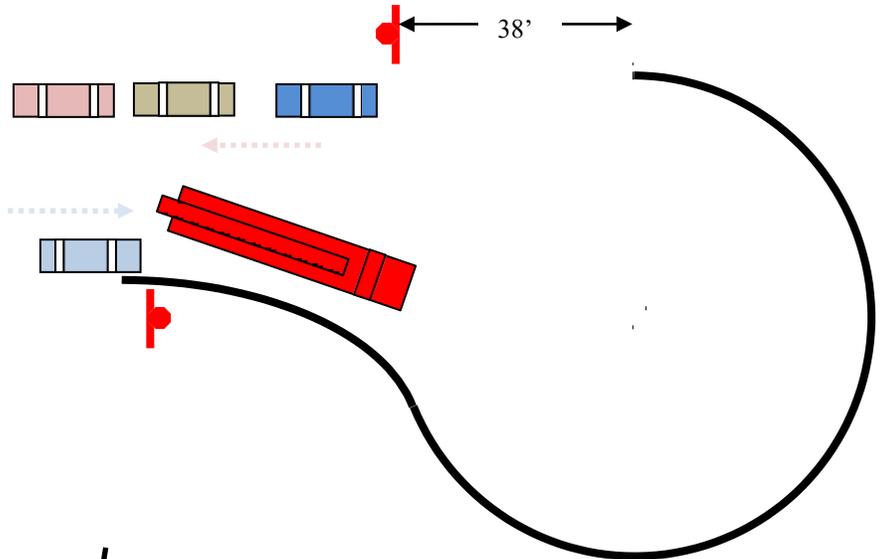
ATTACHMENT 14

Fire Lane No Parking Sign Locations for Cul-de-sacs



Standard 38' radius cul-de-sac
“no-parking entire cul-de-sac begin”
and “end” signs shall be located at the
point where the street begins to widen
into the bulb (see Attachment 11).

Offset 38' radius cul-de-sac: “no-parking
entire cul-de-sac begin” and “end” signs
shall be located at the point where the street
begins to widen into the bulb and at a point
38' from where the cul-de-sac and street
are tangent (see Attachment 11).

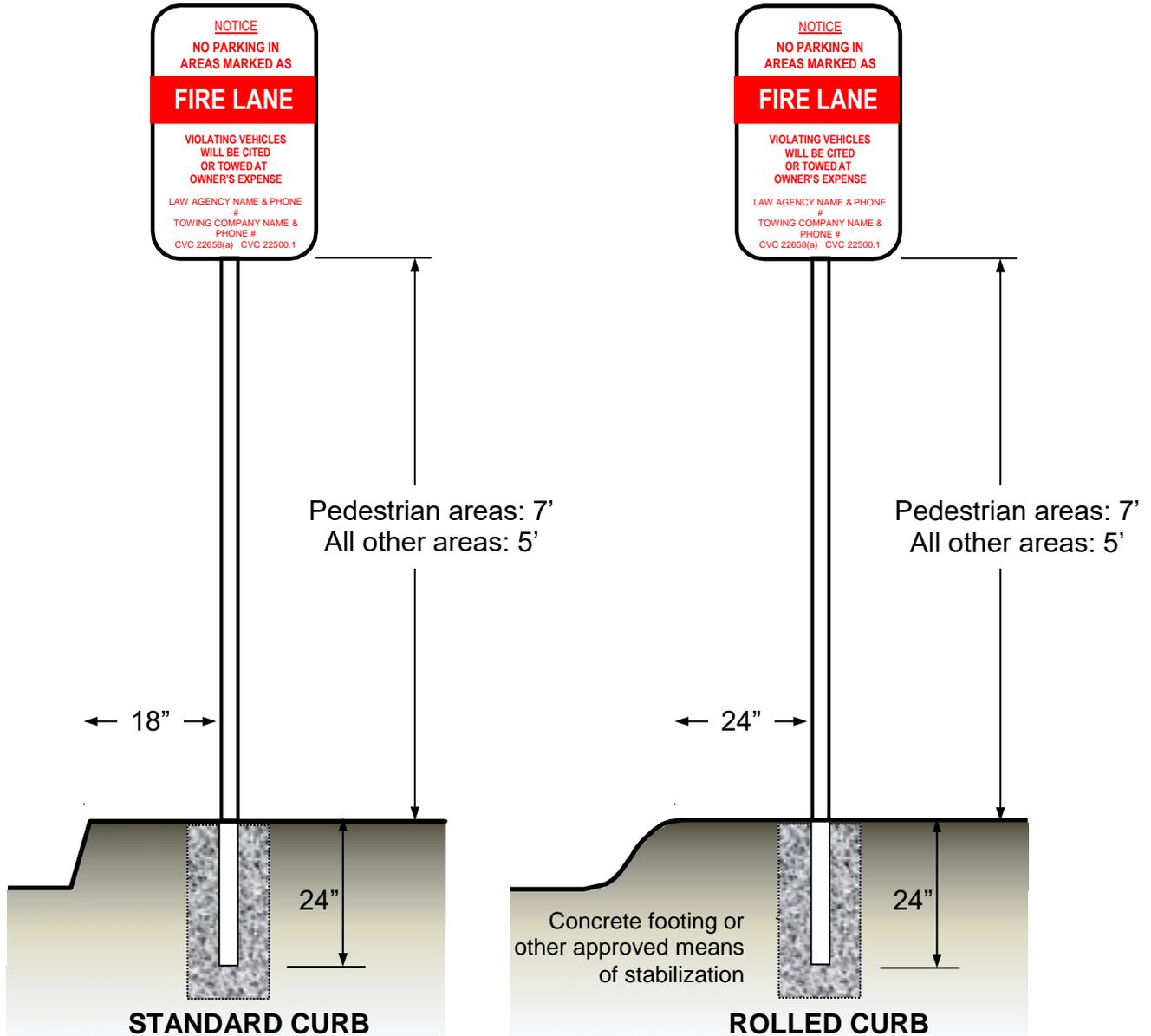


Where size and placement of
driveways ensure sufficient space is
available to execute a three-point
turn, no-parking signs are
unnecessary.

*Drawing
not to scale*

ATTACHMENT 15

Mounting Specifications for Fire Lane Entrance and No Parking Signs



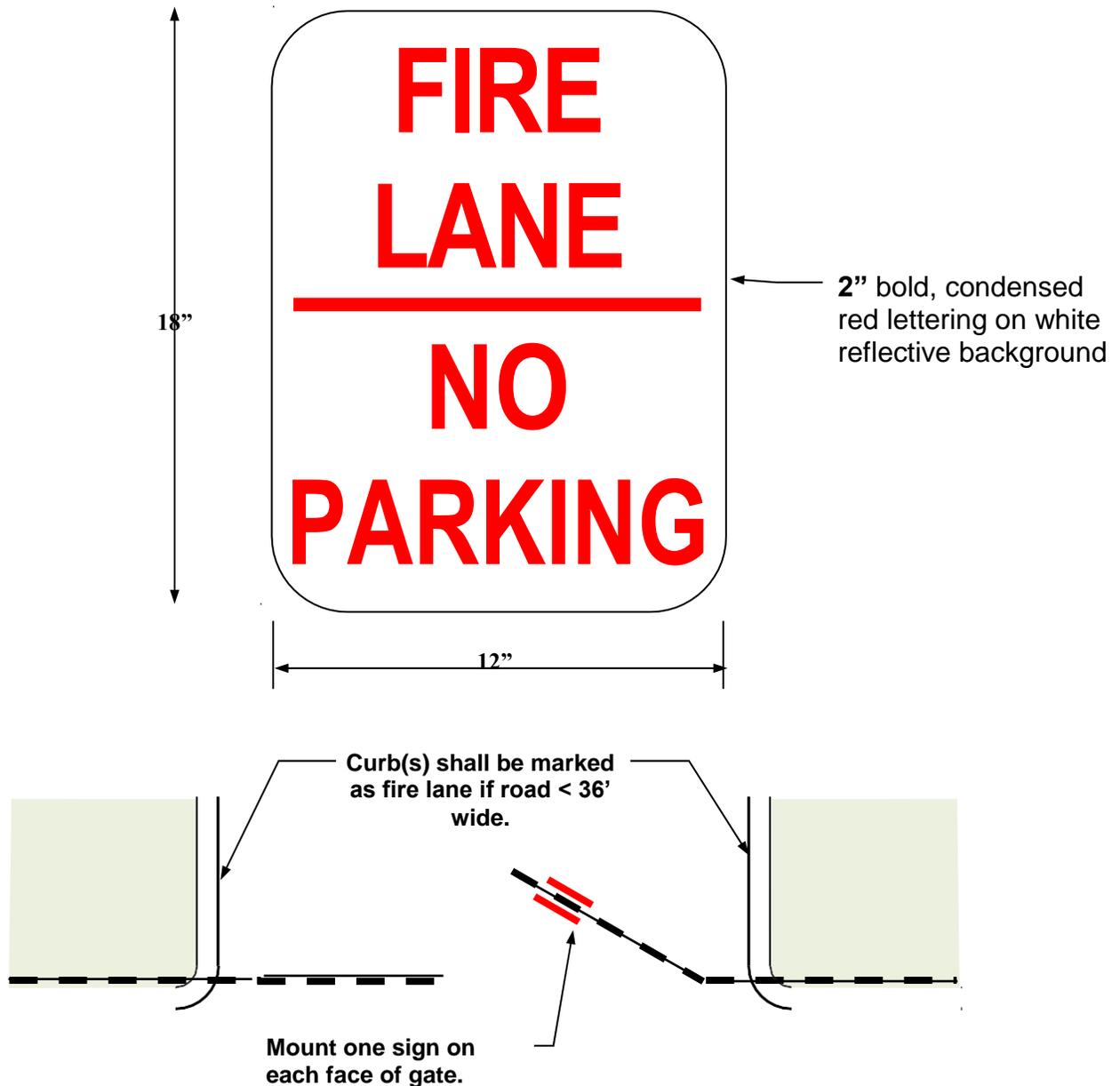
Signs shall be mounted facing the direction of vehicular travel.

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" and rebar, a concrete footing, or another method to prevent removal of the sign is recommended. Footings for signs located in the public right-of-way shall be per the local jurisdiction's requirements.

ATTACHMENT 16

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

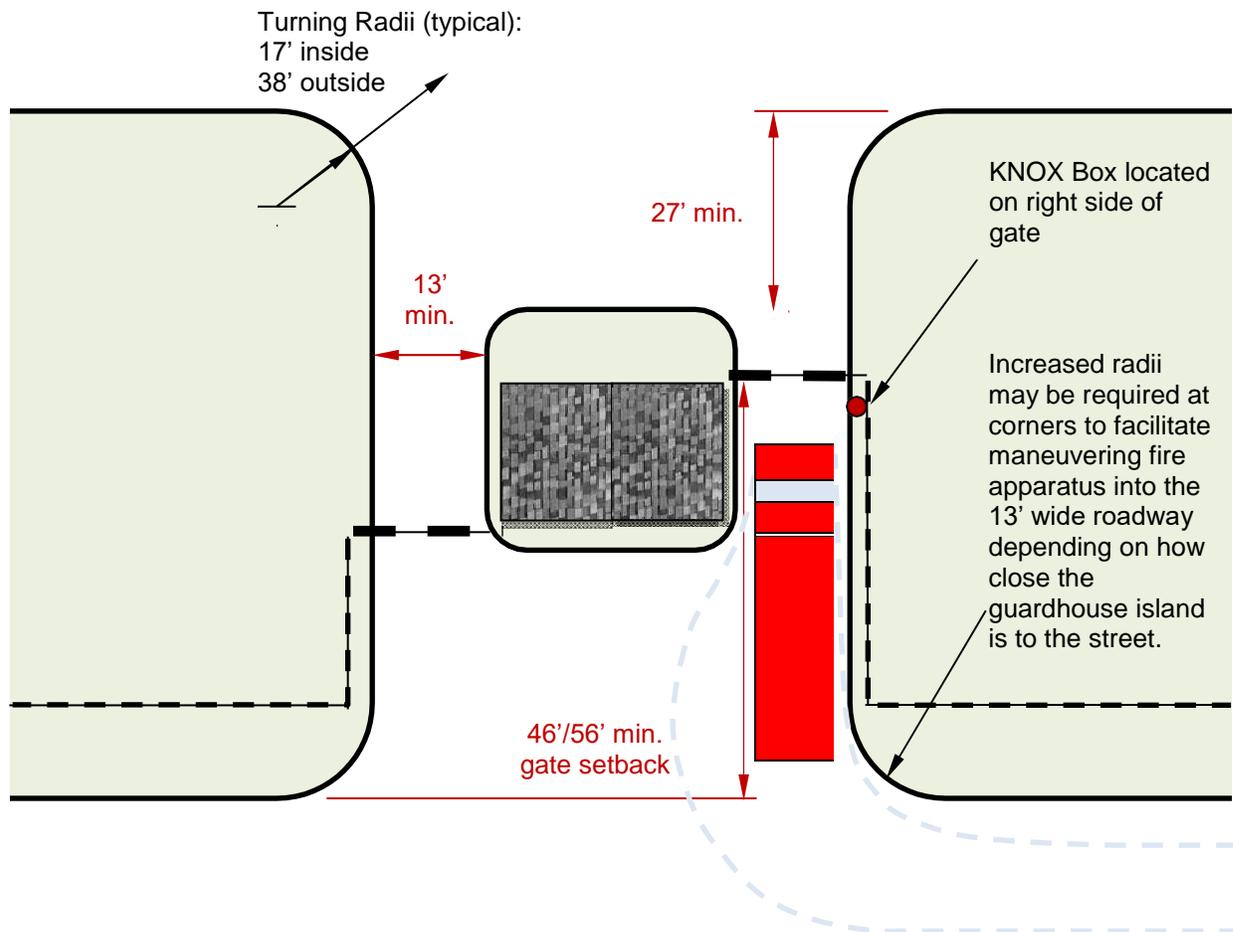


All sign and lettering dimensions shown are minimums. "Arial Narrow" font used is used in sample above though other legible sans-serif fonts may be acceptable.

"Fire Lane—No Parking" sign shown in Attachment 10 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 17

Minimum Gate Setbacks



*Drawing
not to scale*

Attachment 18

OPTICOM / ACCESS CONTROLLED GATE REQUIREMENTS

Document Submittals

- The Rodeo-Hercules Fire Protection District requires two copies of the plans/drawings.

General

- The Fire District's authorized approval shall be obtained prior to installation.
- Security gates, which obstruct fire lane easements, dedicated utilities in single-family, multi-family dwellings, or industrial dwellings shall install and maintain in accordance with provisions of this Section and, Section 503 UFC, ASTM F2200 and ANSI/UL 325.
- Encompasses all access/controlled access systems, which opens electro-mechanically using an Opticom system activated by Rodeo-Hercules Fire Protection District emergency vehicles.

Opticom Receiving System must meet the following criteria:

- Locate device per manufacturer's recommendations and approval at the time of plan review;
- Be equipped with one flasher unit and an external lamp assembly with red globe to be mounted separate from the Opticom device and clearly visible from the entry side of gate;
- Be located so that it will receive a clear signal from emergency apparatus at a stacking distance of at least 30 feet from the Opticom receiver;
- The device shall override all other opening systems;
- Opticom system shall be protected from weather and physical damage; and
- Gate shall operate at a minimum of one foot per second and turn on flashing red alert lamp when the system is activated by the Opticom signal. The gate is held open and the lamp continues flashing for fifteen minutes at which time the gate will reset automatic or manual reset activated.

Manual Back-up Required

Where an electromechanical secured access/controlled access stem is installed, a manual back-up system must be provided and shall be accessible on the entry side of the gate, using the Rodeo-Hercules Fire Protection District Knox Box Security Key. A fail-safe manual backup system shall be installed to allow access through the gate in the event of a power failure or other failure of the electromechanical system.

Swing gates and Barrier arm systems shall be designed:

- To open manually by one person, removing the Knox PL-IW padlock and/or pin that is secured in the gate arm; and
- So that the Knox padlock is clearly visible and easily accessible from the entry side of the gate

On slide gates this system shall be designed:

- To open manually by one person utilizing a single manual release device; and
- So that the device is protected from weather and physical damage.
 - ❖ Red in color
 - ❖ At least 5 inches wide and 1-1/2 inches deep;
 - ❖ Clearly labeled "Fire Dept" in white block letters, one inch tall with a one-quarter in stroke;
 - ❖ Located within 10 feet from the entry side of the gate;
 - ❖ Clearly visible and easily accessible; and
 - ❖ Designed to accept the Rodeo-Hercules Fire Protection District Knox Security Key, when used with the manual release device.

The Rodeo-Hercules Fire Protection District Fire Chief must approve any system other than those described above.

Review Procedure

- The applicant will be required to submit a preliminary development package (PDP) for site plan review by the Rodeo-Hercules Fire Protection District. The plan should indicate the location of the gate proposed. The structure should show the dimensions to the property line, building and any other fixed structures on the site plan.
- The Rodeo-Hercules Fire Protection District will review the site plan. The second access system must comply with the zoning ordinance, fence ordinance and other applicable City codes with regard to height, location, materials, sight visibility and other requirements.
- A written description of the gate and fence shall be submitted to the Rodeo-Hercules Fire Protection District and will include the following;
 - ❖ Emergency vehicle and pedestrian gate operation, indicating the option chosen;
 - ❖ Manual back-up operation, indication the option chosen;
 - ❖ Gate and/or fence construction materials; and
 - ❖ Adequate plans and information as necessary to indicate that standard compliance shall be provided.

Maintenance

The gate opening system shall be maintained in approved operating conditions as delineated below:

- The mechanical components shall be serviced on a regular basis and maintained in an approved operating condition.
- The electrical components shall be maintained in an approved operating condition; and
- A power supply shall be maintained to electronic components at all times.
- All components of the gate operating system to include radio receivers, Opticom receivers, Knox Ks-2P switches, Knox PL-IW, and other gate devices, shall be provided, installed and maintained by the property owner.

Test Requirements

- Within 30 calendar days of the installation of an approved security gate system, a performance test shall be conducted by the Fire Department.
- Upon failure of performance test, the security gate system shall be disabled and maintained in the open position until repaired and successfully tested by the Fire Department.

Liability

The installation of access control gates holds the property owner liable for the gates, the function of the gates, or failure of function of the gates.

ATTACHMENT 18a

RHFPD Notes for Motorized Vehicle Gates

All of the notes listed below shall be placed on the plan verbatim, under the heading “RHFPD Notes for Motorized Vehicle Gates.” Indicate the type of remote gate operator under Note #1.

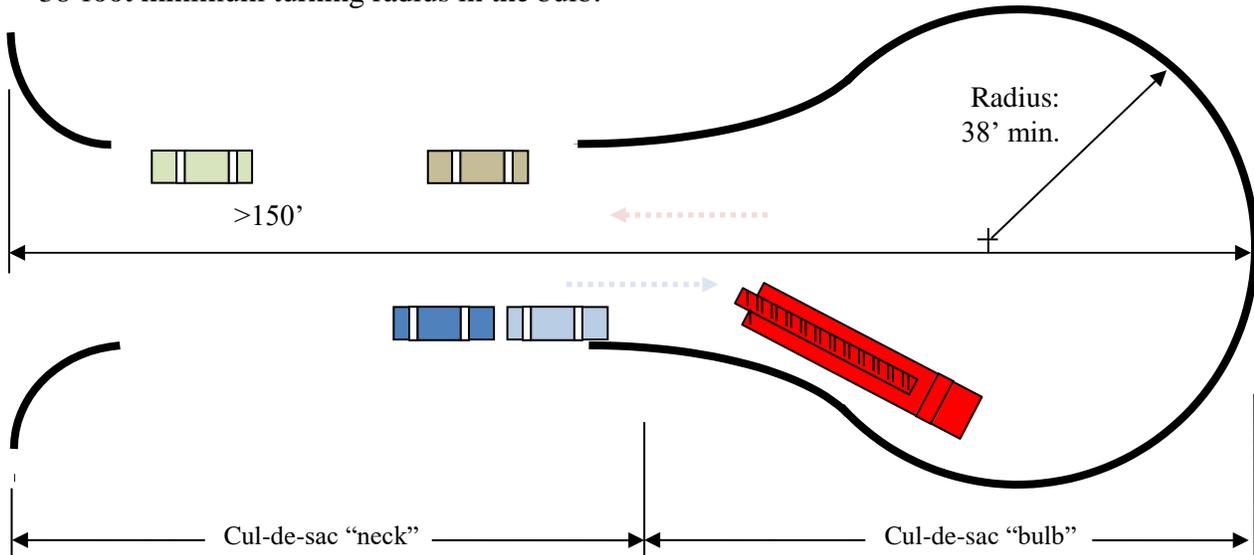
RHFPD Notes for Motorized Vehicle Gates

- 1) A remote opening device is required. The remote gate opening device that is installed must be compatible with 3M Opticom systems.
- 2) In the event of loss of normal power to the gate operating mechanism, it shall be automatically transferred to a fail-safe mode allowing the gate to be pushed open by a single firefighter *without any other actions, knowledge, or manipulation of the operating mechanism being necessary.*
 - a) A battery may only be used in place of fail-safe manual operation when the gate operator has a fail-open mode that will automatically, immediately, and completely open the gate and keep it open upon reaching a low power threshold, regardless of the presence of normal power.
 - b) Should the gate be too large or heavy for a single firefighter to open manually, a secondary source of reliable power by means of an emergency generator or a capacitor with enough reserve to automatically, immediately, and completely open the gate upon loss of primary power shall be provided for fail-open operation.
- 3) In addition to the remote operator, the gate control shall be operable by a Knox emergency override key switch equipped with a dust cover. Upon activation of the key switch, the gate shall open and remain open until returned to normal operation by means of the key switch. Where a gate consists of two leaves, the key switch shall open both simultaneously if operation of a single leaf on the ingress side does not provide for the width, turning radii, or setbacks necessary for fire apparatus to navigate the vehicle entry point.
- 4) The key switch shall be placed between 42” and 48” above the roadway surface at the right side of the access gate within two feet of the edge of the roadway.
- 5) The key switch shall be readily visible and unobstructed from the fire lane leading to the gate.
- 6) The key switch shall be labeled with a permanent red sign with not less than ½” contrasting letters reading “FIRE DEPT” or with a “Knox” decal.

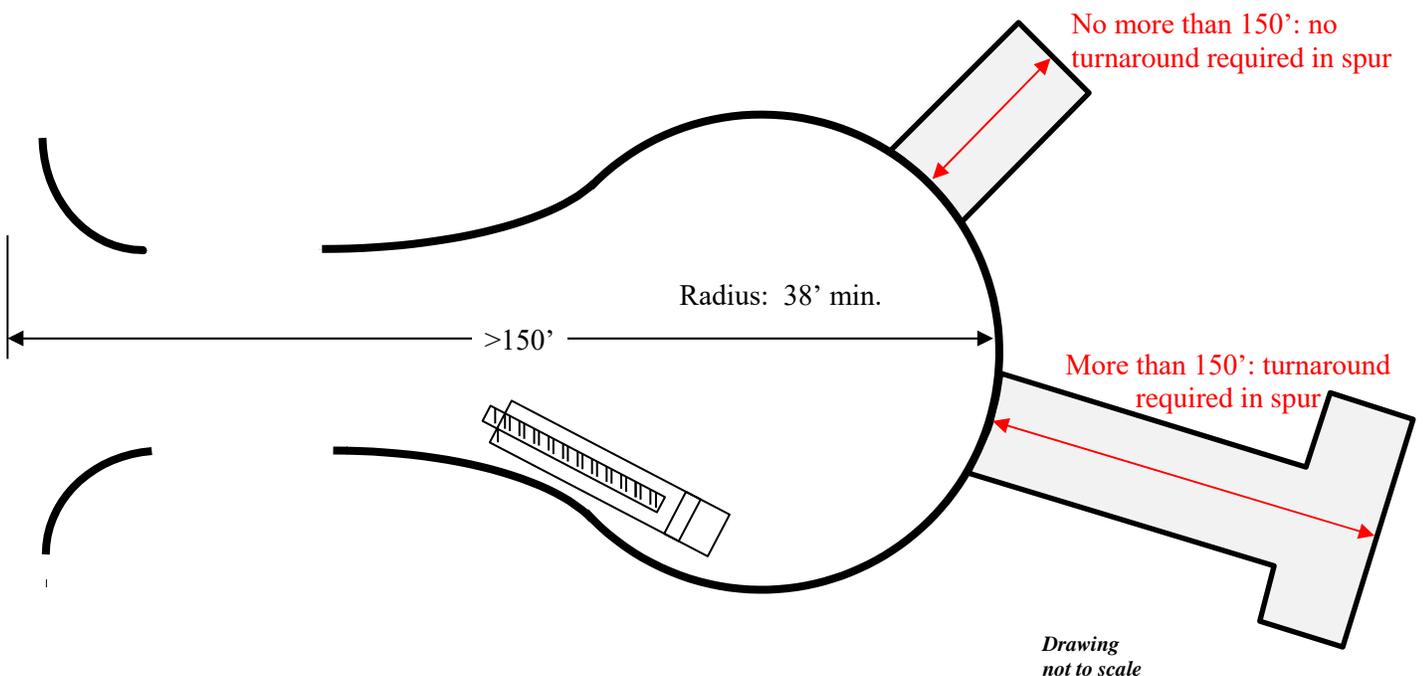
ATTACHMENT 19

Cul-de-sacs and Dead-end Roadways

- 1) Cul-de-sac streets greater than 150 feet in length that are required fire lanes shall be provided with a 38-foot minimum turning radius in the bulb.



- 2) Where a spur road or private driveway that is a required fire lane is accessed via the cul-de-sac road, the driveway or spur shall be no more than 150' in length unless an approved turnaround has been provided within 150' of the end of the spur or driveway.

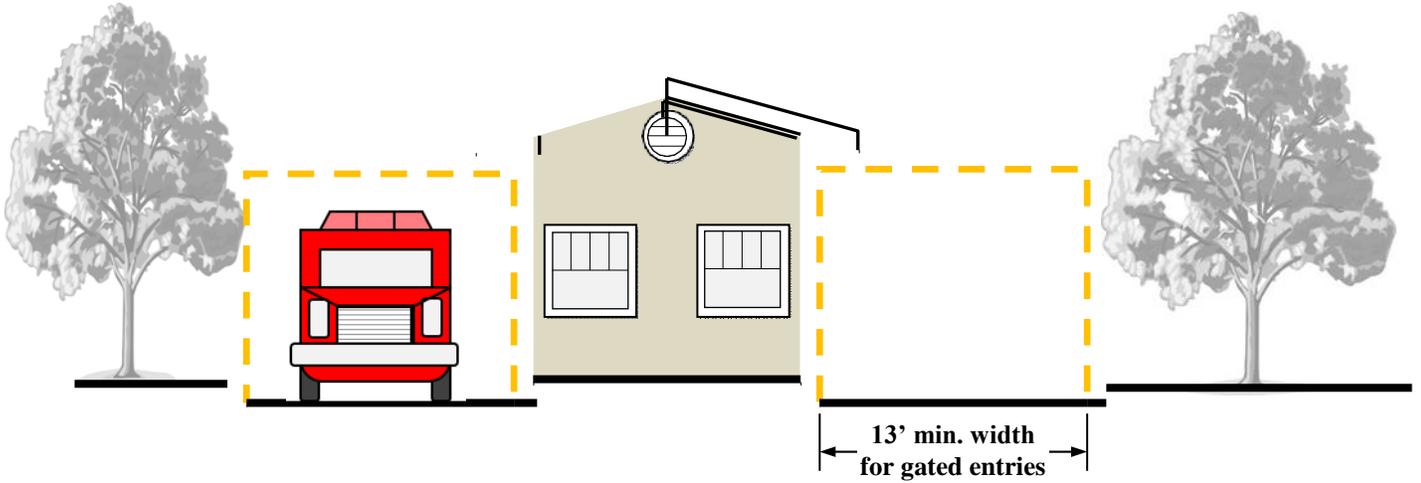


Drawing
not to scale

ATTACHMENT 20

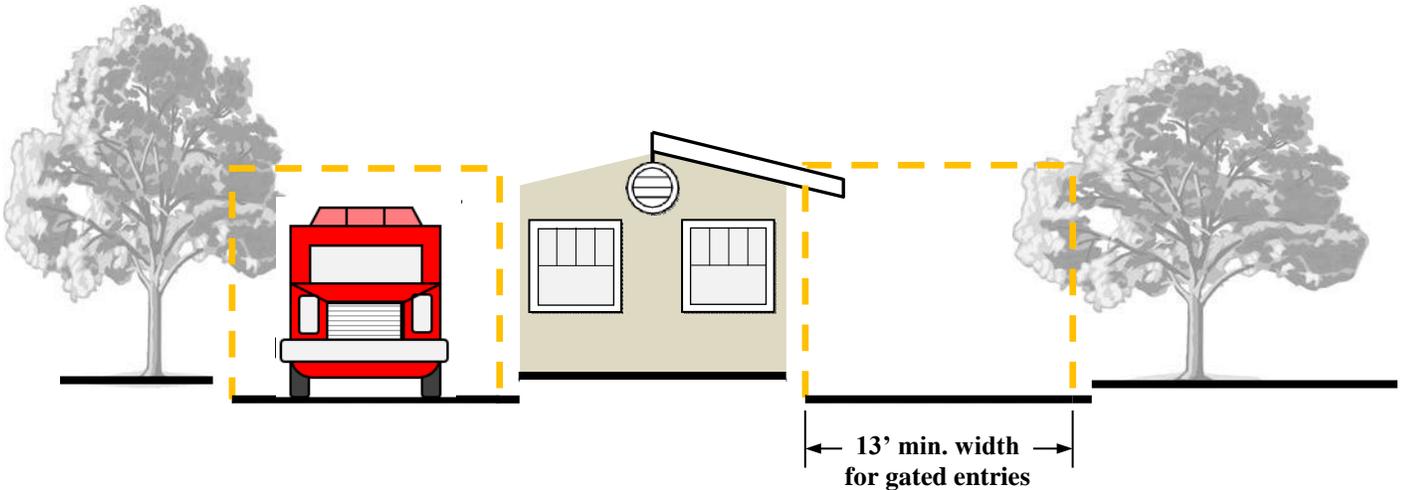
Fire Apparatus Access Roadway Clearance for Typical Gated Community Guard House

Fire lane width reductions detailed below are applicable only to the area immediately adjacent to the guard house or gate. Roads leading up to and beyond the guard house or gate shall meet standard fire lane width requirements prescribed in this guideline.



PROPER CLEARANCE PROVIDED

Eaves and vegetation do not encroach upon the 13'-wide by 13'-6" high minimum dimensions allowed for the fire access roadway next to the guard house.

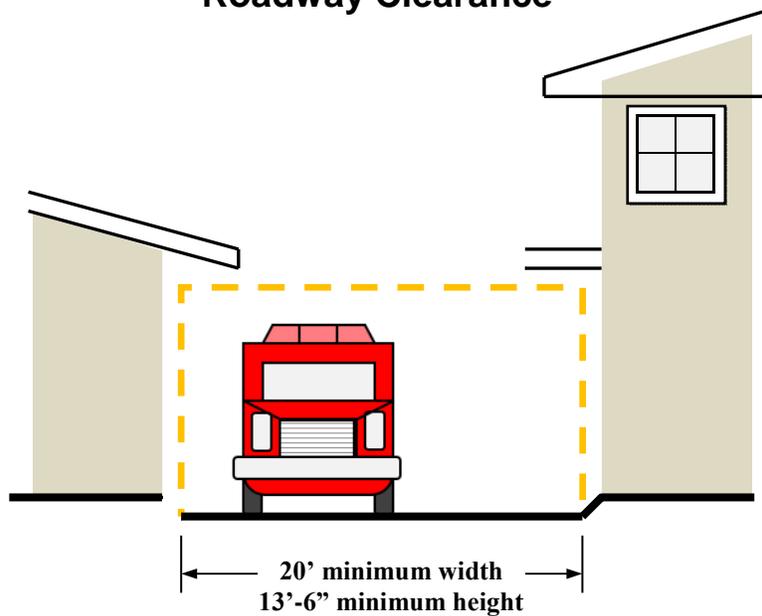


INSUFFICIENT CLEARANCE

While a 13'-wide access roadway is provided next to the guard house, eaves and vegetation encroach upon the minimum clear height of the fire lane.

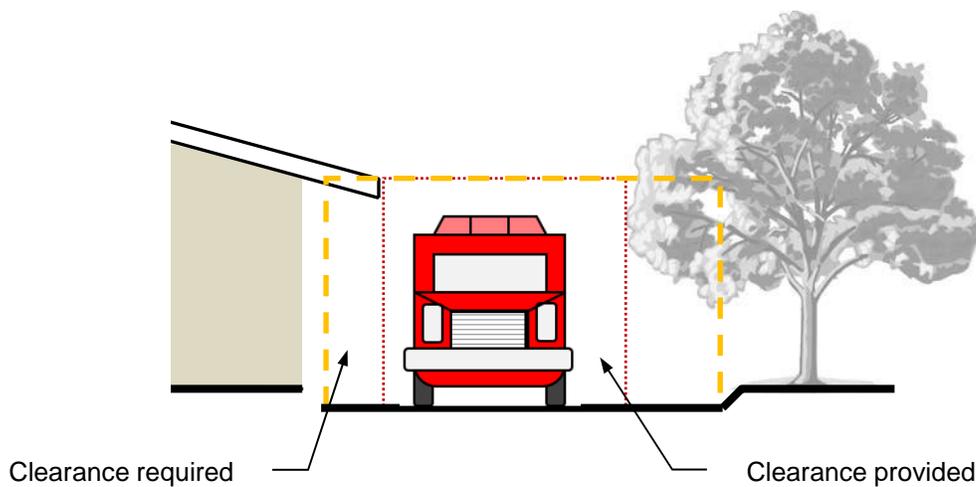
ATTACHMENT 20a

Fire Apparatus 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. As projections over the fire lane can interfere with firefighting and rescue operations, such obstructions shall be limited.



INSUFFICIENT CLEARANCE

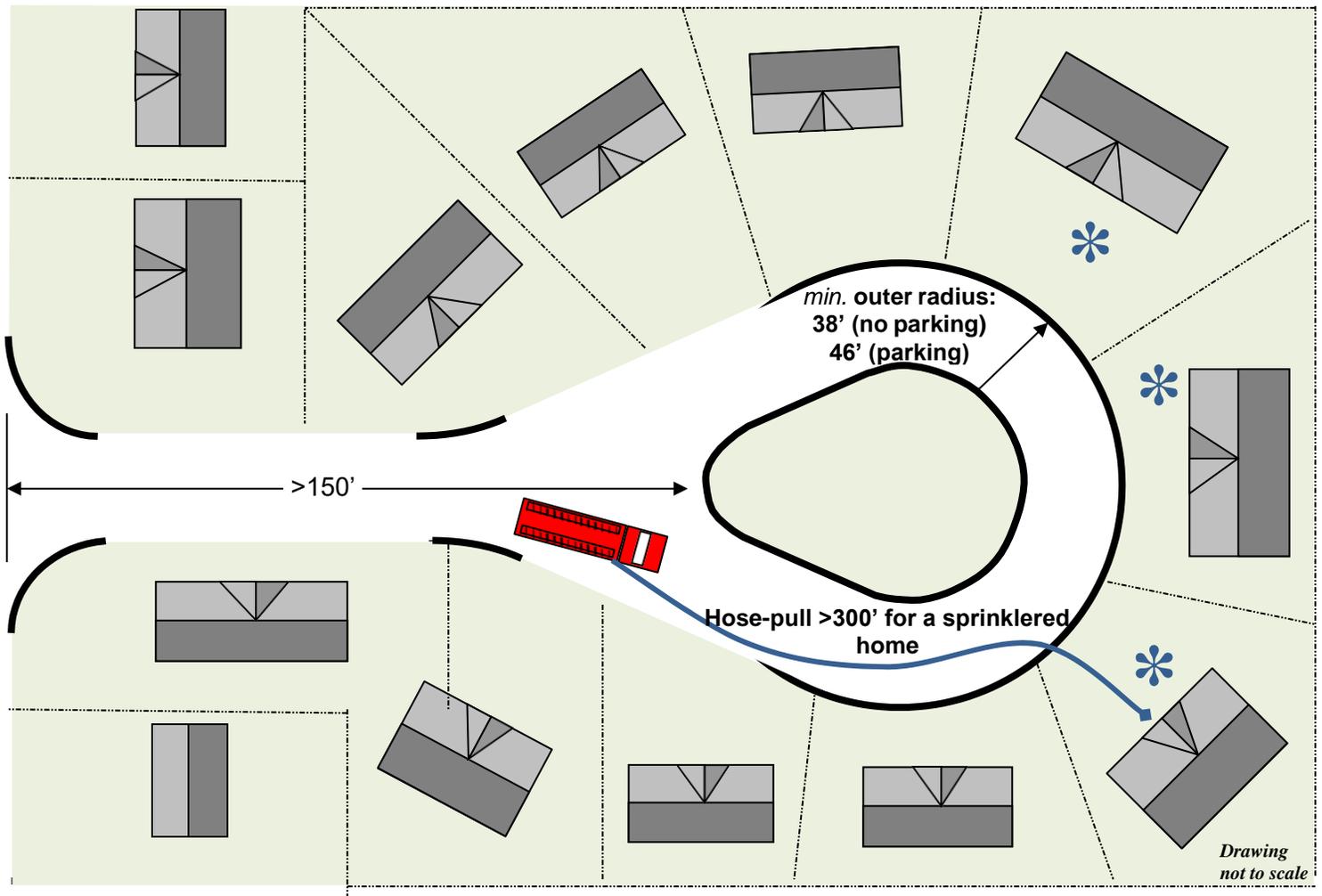
A 20'-wide roadway has been provided, but eaves and vegetation effectively reduce the clear dimensions below required minimums.

ATTACHMENT 21

Cul-de-sacs Longer than 150' with Islands

Cul-de-sac streets greater than 150 feet in length may contain a center island provided that:

- 1) A *minimum* 28-foot-wide drive lane with an adequate inside turning radius is provided, and
- 2) The island is designated a no parking area with red curbs or signs, and
- 3) Island landscaping will not intrude into the drive lane, and
- 4) An NFPA 13-D sprinkler system with full protection of the attic space(s) is installed in the homes where hose-pull requirements can only be satisfied by taking access from the drive lane beyond the beginning of the island.

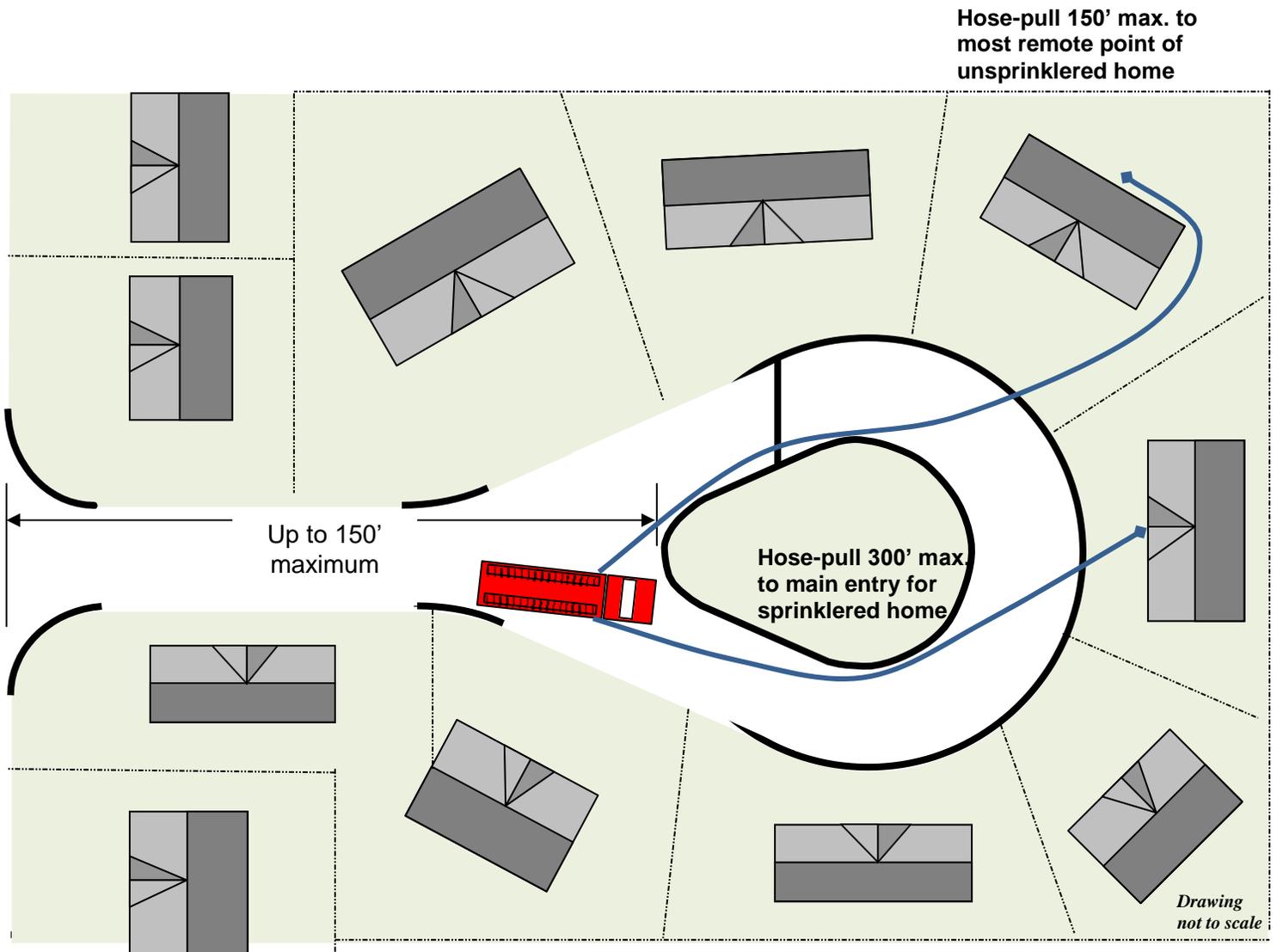


- * Attic protection required where hose-pull distance from the portion of the cul-de-sac preceding the island to the front entry of a sprinklered home exceeds 300'. For existing un-sprinklered homes, hose pull may not exceed 150' to the most remote point around the perimeter of the home or sprinklers with attic protection will be required.

ATTACHMENT 22

Cul-de-sacs up to 150' with Islands

Access to the homes will be measured along an approved route around the island and any other obstructions in the path of travel from the point where the island begins to impede fire apparatus. If hose-pull to the main entry of a sprinklered home exceeds 300' (or 150' to the most remote point around the perimeter for unsprinklered homes), the portion of the bulb beyond the island shall be designed as a fire lane or other mitigating features shall be provided. If all homes are in access from the area preceding the island, the portion of the bulb beyond the island is not required to comply with RHFPD fire access roadway requirements. The neck and portion of the bulb preceding the island shall meet all other fire lane requirements prescribed in this guideline if it is a required fire lane.

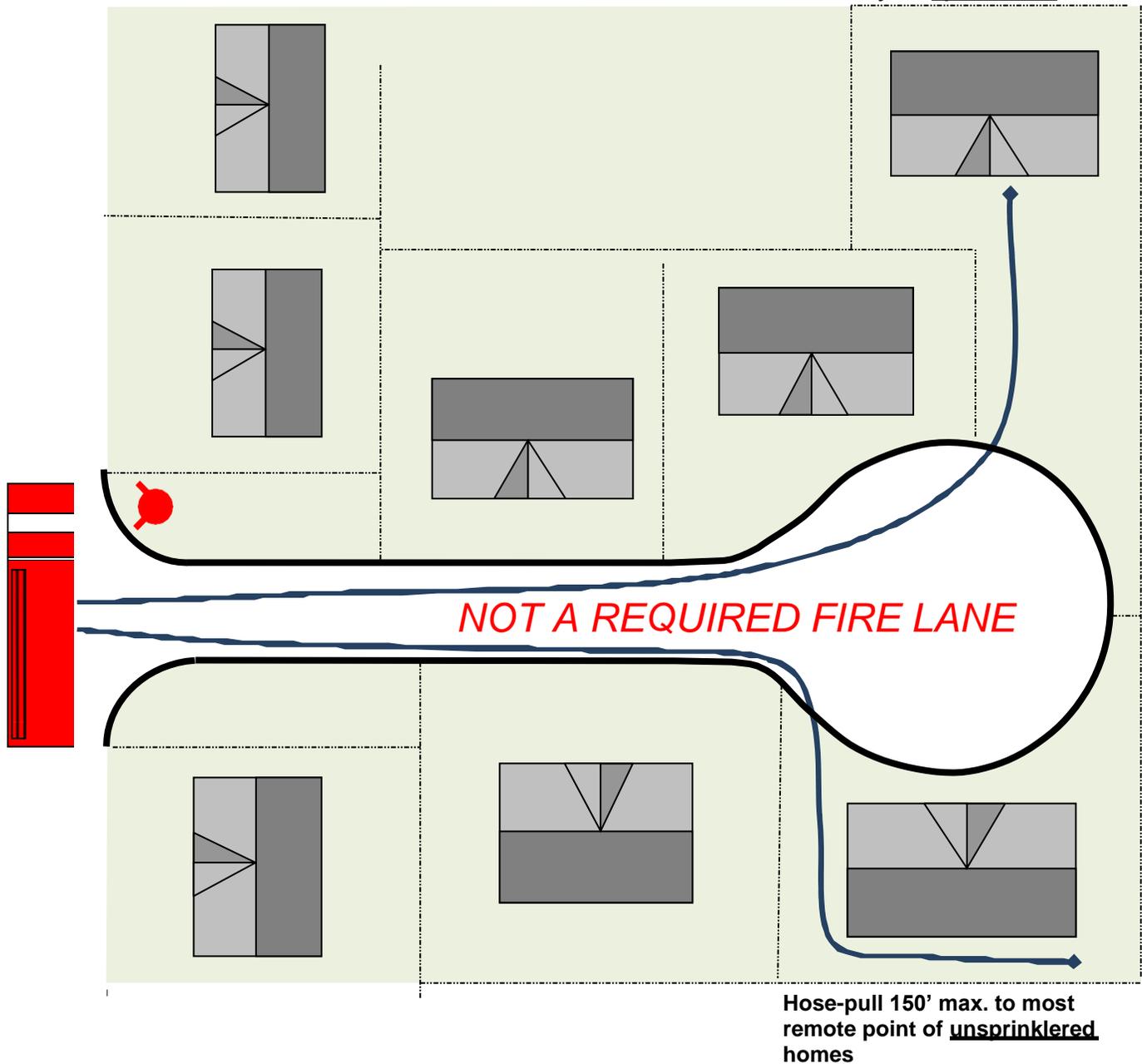


ATTACHMENT 23

Short Cul-de-sacs and Dead-end Roads

If hose-pull distance can be satisfied without fire apparatus entering the cul-de-sac or dead-end road, and the road is not otherwise required to be a fire lane as determined by the fire code official, the street is not required to have a bulb or hammerhead with minimum RHFPD turning radii or meet other standard fire lane requirements.

Hose-pull 300' max. to main entry for sprinklered homes



*Drawing
not to scale*

ATTACHMENT 24

Sample Parking Enforcement Letter

Date

Rodeo-Hercules Fire Protection District
1680 Refugio Valley Road
Hercules, CA 94547

Re: *(Project Name, Location, and Service Request Number)*

Parking Enforcement Plan

The fire lane parking enforcement plan for the above referenced project is stated as follows:

All fire lanes within *(list development address or tract information)* shall be maintained and in no event shall parking be permitted along any portion of a street or drive that required fire lanes or any area designated as a fire lane for turn-around purposes either during construction or after occupancy.

(Association name) shall adopt reasonable rules and regulations regarding the parking of vehicles along the streets, roads and or drives within the project that are not in conflict with applicable law.

In furtherance thereof, *(Association name)*, through its officers, committees and agents, will establish the “parking” and “no parking” areas within the property in accordance with Section 22658 of the California Vehicle Code and the RHFPD’s Citation Program. The law shall be enforced through such rules and regulations by all lawful means, including, written warnings, citing, levying fines and towing vehicles in violation.

(Association name) will contract with a certified patrol and towing company to remove vehicles that violate no parking restrictions. First time violators will receive a written warning and with subsequent violations, the vehicle shall be subject to towing. The vehicle owner shall be responsible for all costs incurred in remedying such violation, including without limitation towing cost, citations and legal fees.

Company or Home Owner
Association
Authorized Agent Signature

Cc:
Hercules City Manager
Hercules PD

ATTACHMENT 25

CFC TABLE C102.1: Hydrant Quantity and Spacing in RHFPD Jurisdiction

DETACHED SINGLE FAMILY RESIDENCES/DUPLEXES *with* SPRINKLERS

Flow Requirement from Table B105.1(2)	Minimum Number of Hydrants	Maximum Distance to a Hydrant		Maximum Distance between Hydrants ¹		Average Distance between Hydrants ¹	
		Thru road	Dead-end	Thru road	Dead-end	Thru road	Dead-end
1000 - 1750	1	300	250	600	500	600	500
1751+	Use the table below						

ALL OTHER STRUCTURES

Flow Requirement from Table B105.1(2)	Minimum Number of Hydrants	Maximum Distance to a Hydrant		Maximum Distance between Hydrants ^{1,2}		Average Distance between Hydrants ^{1,2}	
		Thru road	Dead-end	Thru road	Dead-end	Thru road	Dead-end
1000 - 1750	1	250	200	500	400	500	400
1751 - 2250	2	225	175	450	350	450	350
2251 - 2500	3	225	175	450	350	450	350
2501 - 3000	3	225	175	450	350	400	300
3001 - 4000	4	210	160	420	320	350	250
4001 - 5000	5	180	130	360	260	300	200
5001 - 5500	6	180	130	360	260	300	200
5501 - 6000	6	150	100	300	200	250	150
6001 - 7000	7	150	100	300	200	250	150
7001+	1 per 1000 gpm or fraction thereof	120	70	240	140	200	100

All distances are in feet.

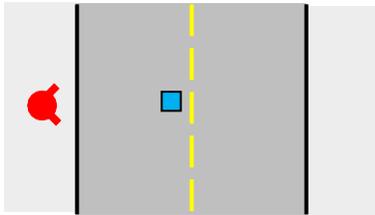
¹ Where streets are provided with median dividers which cannot be crossed by fire fighters pulling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis.

² Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.

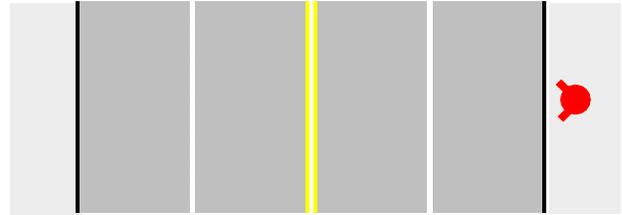
ATTACHMENT 26

“Blue Dot” Reflective Hydrant Marker Location

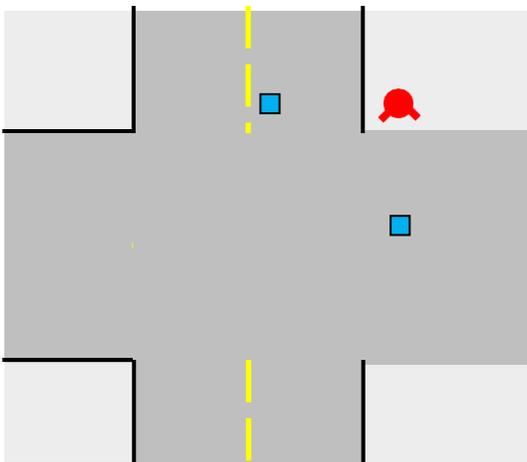
TWO LANE STREET



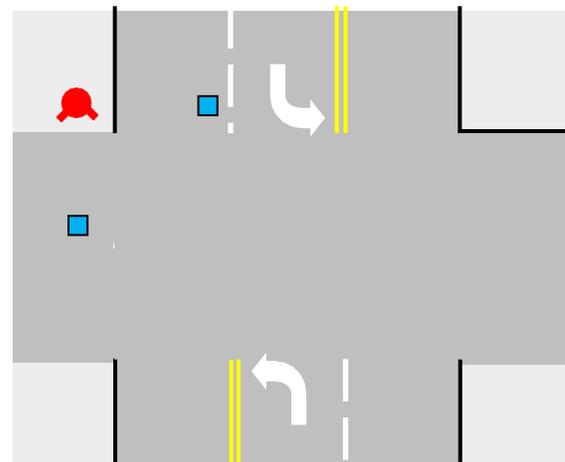
MULTI-LANE STREET



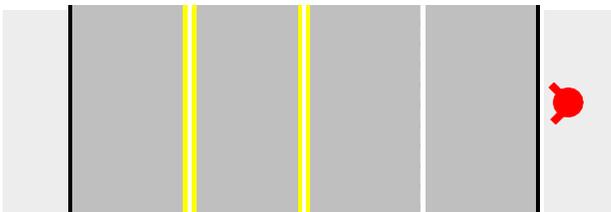
INTERSECTION



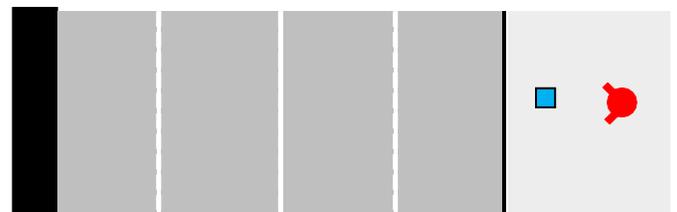
INTERSECTION WITH TURN LANES



MULTILANE STREET WITH TURN LANE



FREEWAYS AND EXPRESSWAYS



The developer may contact the local water company to arrange the installation of the blue dots. If the water agency does not participate in the blue dot program, the developer is still responsible to install the dots in an approved manner.

ATTACHMENT 27

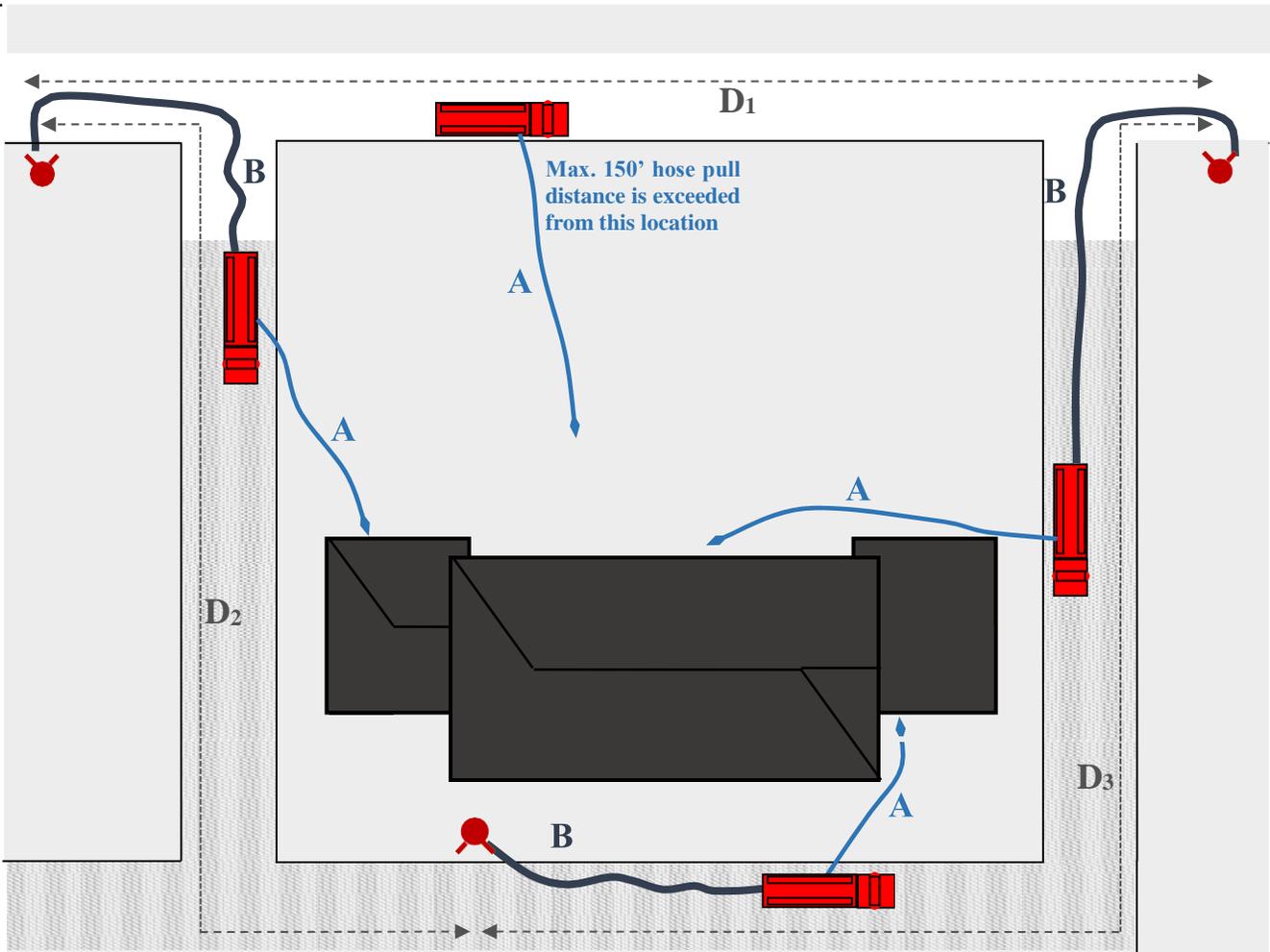
Distance from Hydrant to Engine, Engine to Building, Between Hydrants

A: Hose Pull (Distance from Fire 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' from the engine to the most remote point of the perimeter of the structure (for sprinklered detached single family homes and duplexes 300' to the front door). *Hose pull is measured along the firefighter path of travel, avoiding any obstacles, not "as the crow flies."* In the diagram below, firefighters would be able to reach the entire perimeter of 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; the engine in the unshaded roadway has a hose pull distance greater than 150' and the building would be considered "out of access" from that point.

For hydrant evaluation purposes, the shaded part of the fire lane is considered to serve the building and must meet hose lay requirements. See Attachment 29 for further information on hose pull measurement and access to structures.

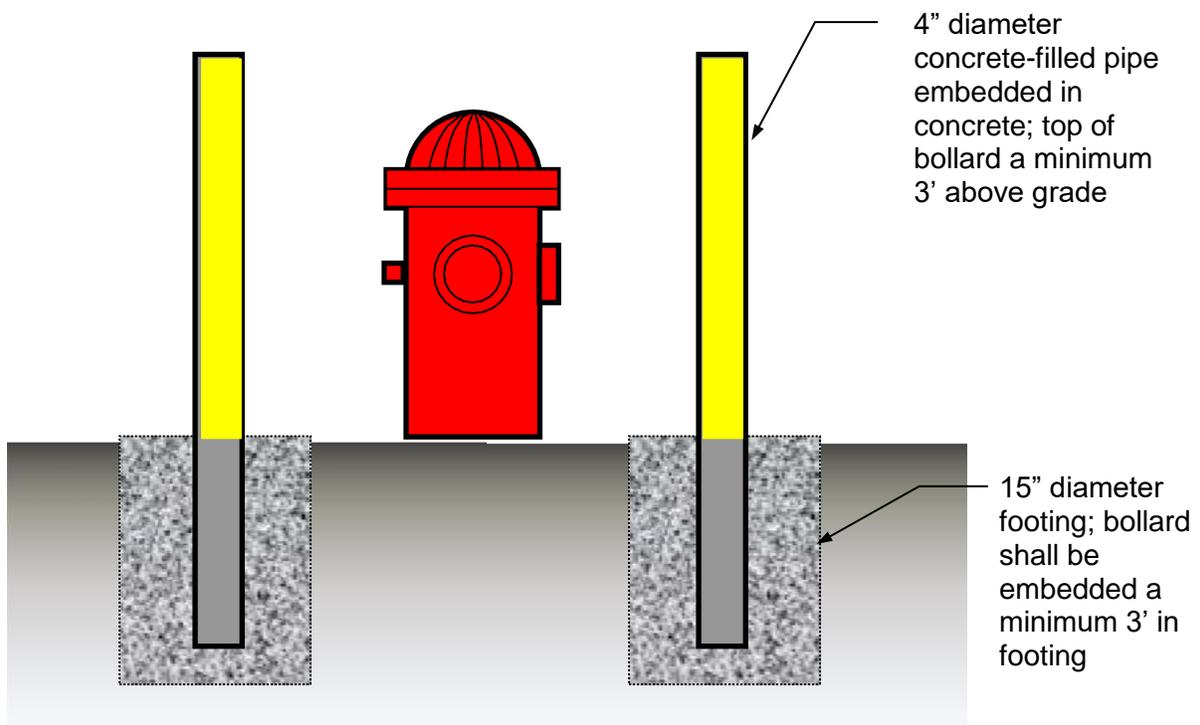
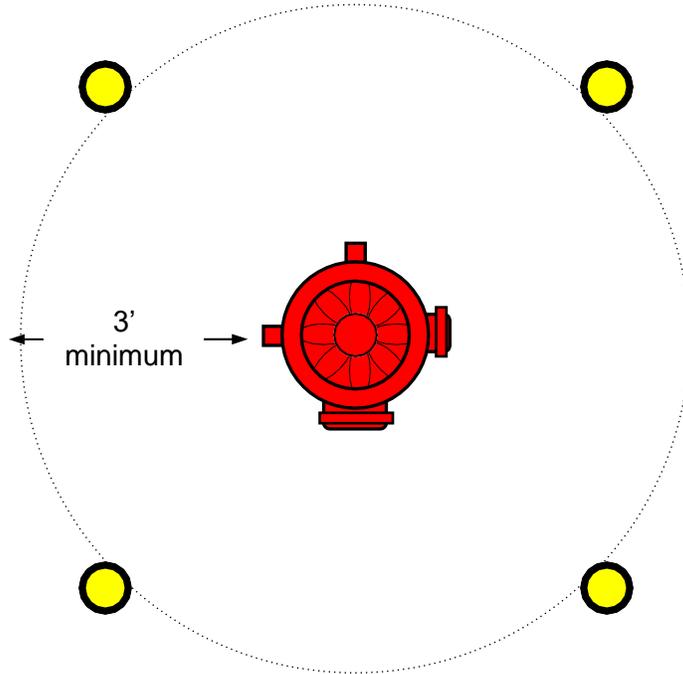
B: Hose Lay (Distance from Engine to a Hydrant): Represents the amount of hose that must be laid out of the engine to supply water from the hydrant to the engine. No point along the portion of the fire lane serving the structure (the shaded road) may be farther from a hydrant than the distance specified in CFC Table C102.1 (see Attachment 25). The hydrant may be located along portions of the fire lane that exceed the hose pull distance (unshaded roadway) 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 that listed in CFC Table C102.1, 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, D₁ may exceed the hydrant spacing requirements, while D₂ and D₃ cannot. The "Average Spacing" from Table C102.1 shall be maintained to prevent multiple hydrants from being concentrated in only one portion of the fire lane.



ATTACHMENT 28

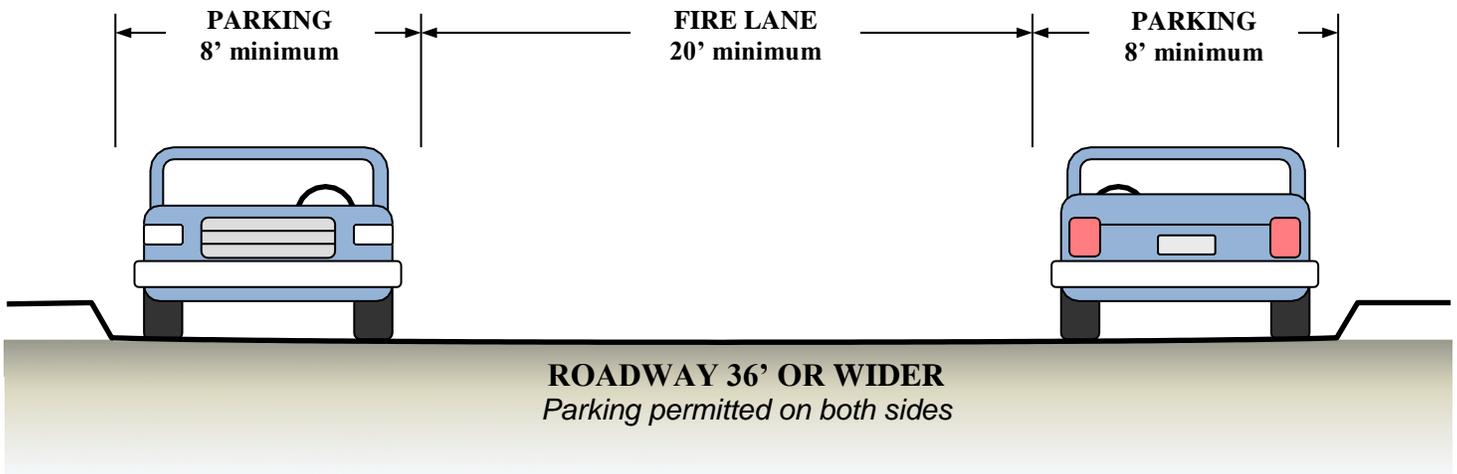
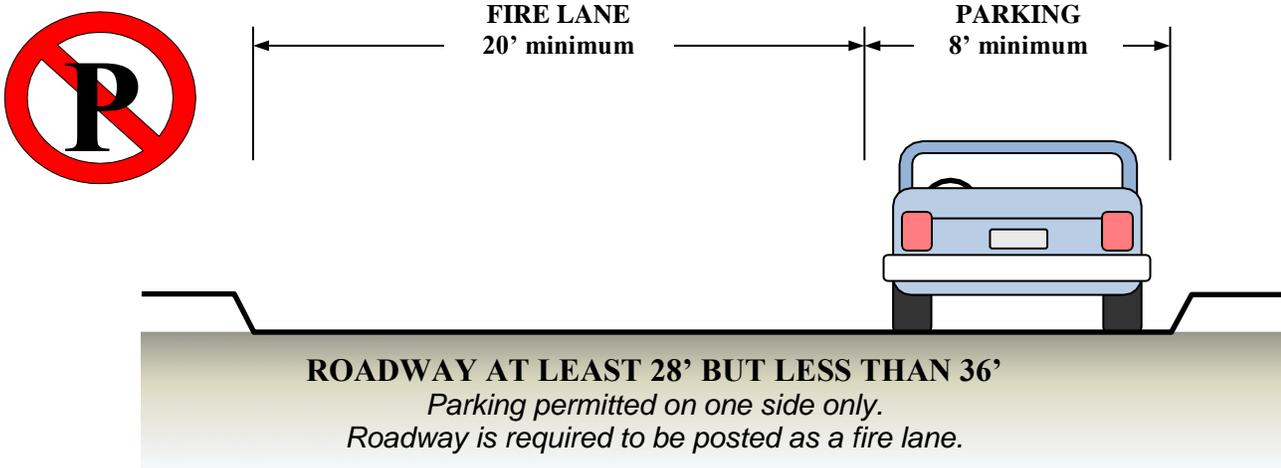
Protection of Hydrants, Detector Checks, Fire Department Connections, and other Appurtenances



ATTACHMENT 29

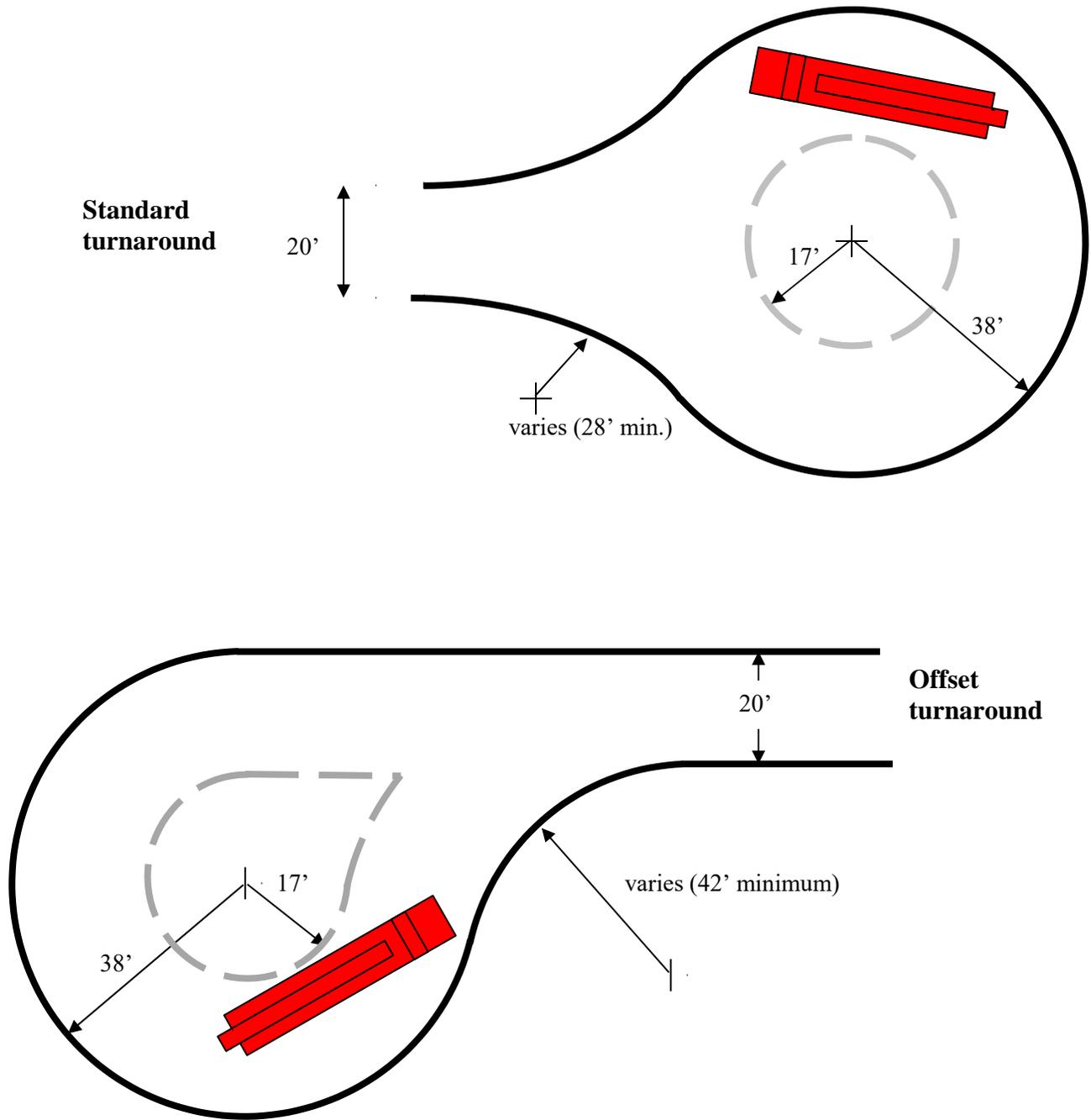
Minimum Road Widths

Measured from top face of curb to top face of curb for standard vertical curbs or flow line to flow line for rolled, ramped, or other curb types.



ATTACHMENT 30

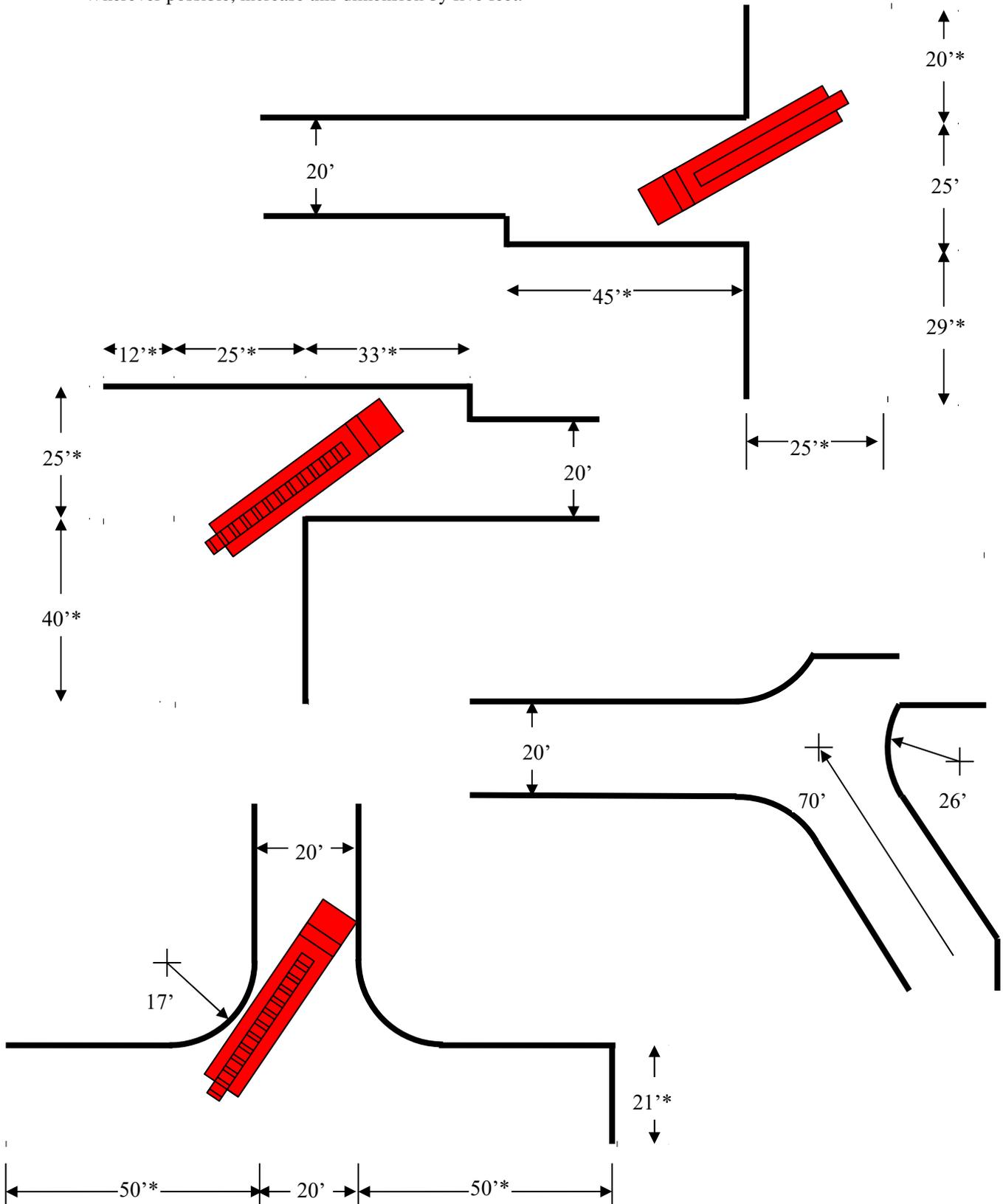
Minimum Turnaround and Hammerhead Dimensions



NOTE: Parking is not permitted in these turnarounds at the dimensions shown. Islands or other obstructions may be allowed to be located within the area bounded by the dashed line representing the inner turning radius.

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

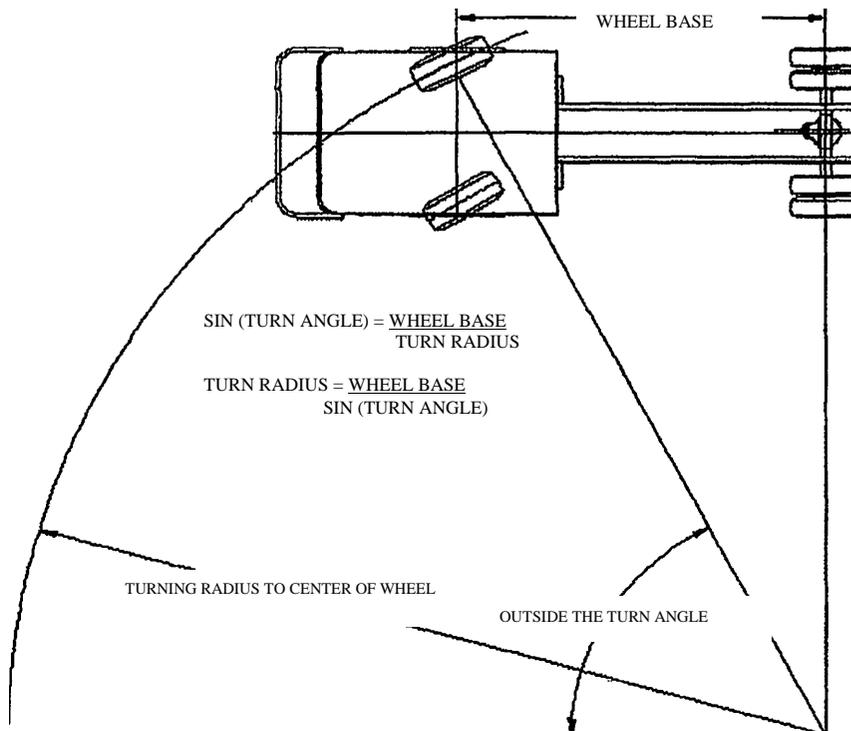
* Wherever possible, increase this dimension by five feet.



ATTACHMENT 30a

Engine Turning Radius

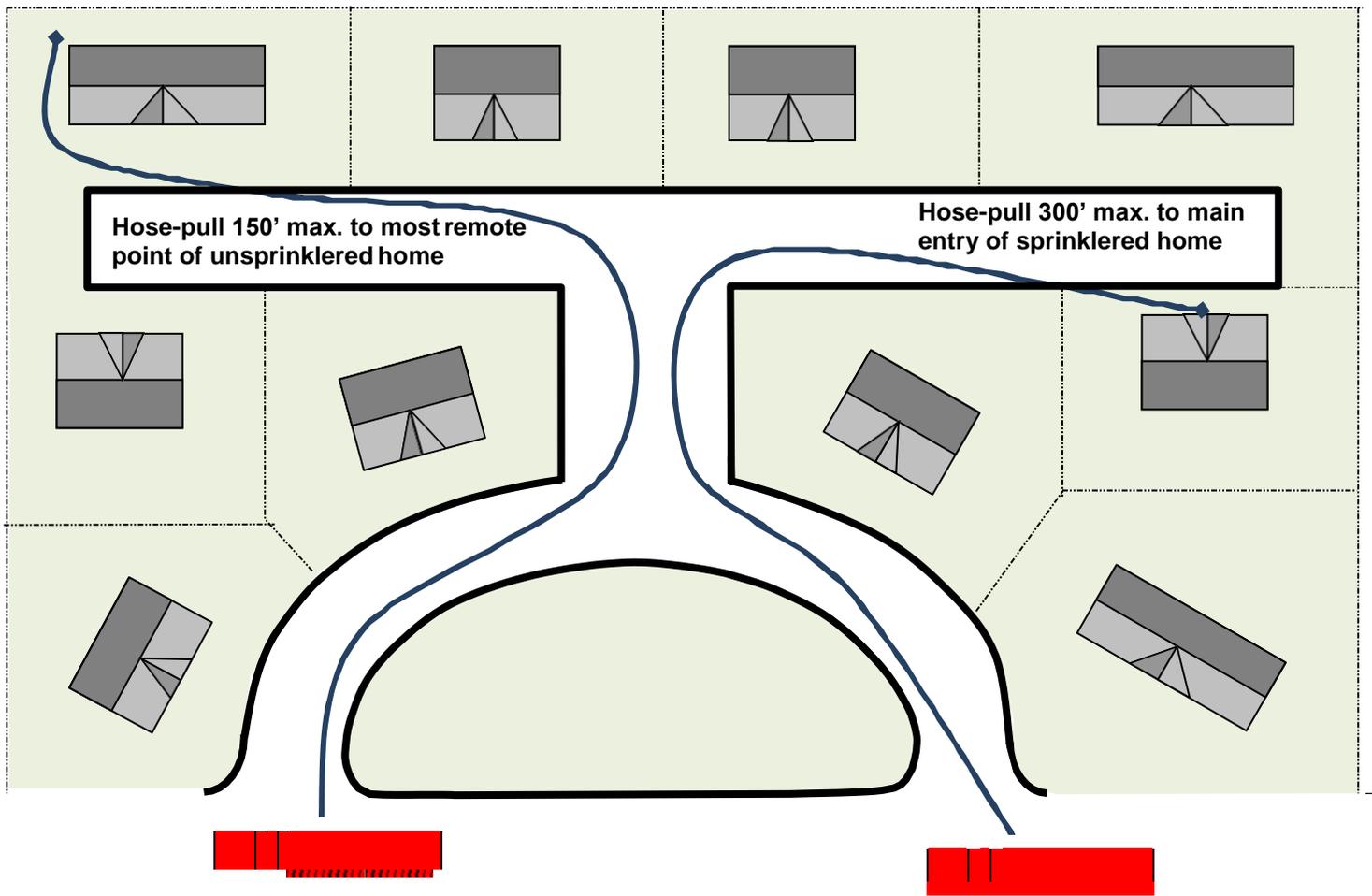
	<u>Right Turn</u>	<u>Left Turn</u>
Wheel Base:	228	228
Tire Size:	425	425
Bumper Extension:	12.5	12.5
OUTSIDE CURB TO CURB TURNING RADIUS		
Wheelbase:	228	228
Front wheel INSIDE turn angle:	44	48
Offset from kingpin to outside of wheel:	16	16
Turn Radius is	36.42 ft.	34.29 ft.
WALL TO WALL TURNING RADIUS		
Wheelbase:	228	228
Length of extension:	12.5	12.5
Width of extension:	101	101
Front wheel INSIDE turn angle:	44	48
Radius at front corner:	12	12
Turn Radius is	39.86 ft.	37.85 ft.



ATTACHMENT 31

Eyebrows

If the eyebrow does not meet RHFDP's minimum turning radius and width requirements, fire department access will be measured from the nearest available fire lane around the island and any other obstructions. If hose-pull to the main entry of a sprinklered home exceeds 300' (or 150' to the most remote point around the perimeter for unsprinklered homes), the eyebrow shall be designed as a fire lane or other mitigating features shall be provided.



*Drawing
not to scale*

ATTACHMENT 32

CFC TABLE B105.1(2): Minimum Required Fire Flow and Flow Duration for Buildings in RHFPD Jurisdiction

FIRE FLOW CALCULATION AREA (square feet)					DETACHED SINGLE-FAMILY RESIDENCE/DUPLEX		OTHER BUILDINGS			
					FIRE FLOW (gallons per minute at 20 psi residual)		DURATION (hours)	FIRE FLOW (gallons per minute at 20 psi residual)		DURATION (hours)
Type IA/IB	Type IIA/IIIA	Type IV/VA	Type IIB/IIIB	Type VB	NS	S		NS	S	
0-22700	0-12700	0-8200	0-5900	0-3600	1000	1000	1	1500	1500	2
22701-30200	12701-17000	8201-10900	5901-7900	3601-4800	1750	1000	NS: 2 S: 1	1750	1500	
30201-38700	17001-21800	10901-12900	7901-9800	4801-6200	2000	1000		2000	1500	
38701-48300	21801-24200	12901-17400	9801-12600	6201-7700	2250	1125		2250	1500	
48301-59000	24201-33200	17401-21300	12601-15400	7701-9400	2500	1250		2500	1500	
59001-70900	33201-39700	21301-25500	15401-18400	9401-11300	2750	1375		2750	1500	
70901-83700	39701-47100	25501-30100	18401-21800	11301-13400	3000	1500	NS: 3 S: 1	3000	1500	3
83701-97700	47101-54900	30101-35200	21801-25900	13401-15600	3250	1625		3250	1625	
97701-112700	54901-63400	35201-40600	25901-29300	15601-18000	3500	1750		3500	1750	
112701-128700	63401-72400	40601-46400	29301-33500	18001-20600	3750	1875	NS: 4 S: 1	3750	1875	4
128701-145900	72401-82100	46401-52500	33501-37900	20601-23300	4000	2000		4000	2000	
145901-164200	82101-92400	52501-59100	37901-42700	23301-26300	4250	2125		4250	2125	
164201-183400	92401-103100	59101-66000	42701-47700	26301-29300	4500	2250		4500	2250	
183401-203700	103101-114600	66001-73300	47701-53000	29301-32600	4750	2375		4750	2375	
203701-225200	114601-126700	73301-81100	53001-58600	32601-36000	5000	2500		5000	2500	
225201-247700	126701-139400	81101-89200	58601-65400	36001-39600	5250	2625		5250	2625	
247701-271200	139401-152600	89201-97700	65401-70600	39601-43400	5500	2750		5500	2750	
271201-295900	152601-166500	97701-106500	70601-77000	43401-47400	5750	2875		5750	2875	
295901+	166501+	106501-115800	77001-83700	47401-51500	6000	3000		6000	3000	
		115801-125500	83701-90600	51501-55700	6250	3125		6250	3125	
		125501-135500	90601-97900	55701-60200	6500	3250		6500	3250	
		135501-145800	97901-106800	60201-64800	6750	3375		6750	3375	
		145801-156700	106801-113200	64801-69600	7000	3500		7000	3500	
		156701-167900	113201-121300	69601-74600	7250	3625	7250	3625		
		167901-179400	121301-129600	74601-79800	7500	3750	7500	3750		
		179401-191400	129601-138300	79801-85100	7750	3875	7750	3875		
		191401+	138301+	85101+	8000	4000	8000	4000		

S: Provided with an approved sprinkler system throughout the structure NS: No fire sprinklers or partially protected with a sprinkler system